

Brief Bio

Eugene S. Takle

Gene Takle is professor emeritus of agricultural meteorology in the Department of Agronomy at Iowa State University.

Professor Takle was a founding member of the multi-institutional team that has produced regional scenarios of future climates under the North American Regional Climate Change Assessment Program. He has been a co-author of the 3rd (2014) and 4th (2018) US National Climate Assessments and 2007 report of the UN Intergovernmental Panel on Climate Change.

He is a Fellow of the American Meteorological Society (AMS) and has been an AMS Certified Consulting Meteorologist since 1984. He served a six year term on the Board of Trustees for the University Corporation for Atmospheric Research.

His current research focuses on impacts of climate change on the Midwest, especially agriculture, and studies of the efficiency of utility-scale wind farms and their interaction with agriculture. His recent paper in *Physics Today* entitled “Iowa’s agriculture is losing its Goldilocks climate” describes how global climate change is providing new challenges to Iowa agriculture.

Dr. Takle hold a BA degree in physics and mathematics from Luther College and a PhD in physics from Iowa State University.

Selected recent publications

- Iowa’s agriculture is losing its Goldilocks climate.** *Physics Today* **73**, (2) 26-33. <https://doi.org/10.1063/PT.3.44>. 2020. E. S. Takle is lead author.
- 4th U. S. National Climate Assessment, Volume I.** *Climate Science Special Report*. 2018. <https://science2017.globalchange.gov/>. E. S. Takle is contributing author.
- 4th U. S. National Climate Assessment, Volume II.** *Climate Change Impacts, Risks, and Adaptation in the United States*. 2018. Midwest Chapter: <https://nca2014.globalchange.gov/report/regions/midwest>. E. S. Takle is co-author
- Improving wind-ramp forecasts in the stable boundary layer.** *Boundary-Layer Meteorology*, **163**, 423-446. Doi.org/10.1007/s10546-017-0237-2. E. S. Takle is co-author.
- Toward understanding the physical link between turbines and microclimate impacts from *in situ* measurements in a large wind farm.** 2016. *J. Geophys. Res. Atmos.*, 121, doi:10.1002/2016JD025297. <https://agupubs.onlinelibrary.wiley.com/doi/full/10.1002/2016JD025297> E. S. Takle is co-author.
- US Food Security and Climate Change: Agricultural Futures.** *Economics: The Open-Access, Open-Assessment E-Journal*, 7, 2013-34. 2013. <http://www.economics-ejournal.org/economics/journalarticles/2013-34>. E. S. Takle is lead author.
- Climate forecasts for corn producer decision-making.** 2014. *Earth Interactions*, **18**, 1-8. doi: <http://dx.doi.org/10.1175/2013EI000541.1>. E. S. Takle is lead author.

A complete curriculum vitae is given below.

Curriculum Vitae
Eugene S. Takle
Agronomy Distinguished Professor Emeritus

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Education

PhD: Physics, Iowa State University, 1971
BA: Physics and Mathematics, Luther College 1966

Employment

Iowa State University, 2018-present
Agronomy Distinguished Professor Emeritus
Iowa State University, 1971-2018
Charles F. Curtiss Distinguished Professor in Agriculture and Life
Science, 2016-2018
Interim Faculty Director, University Honors Program, 2006-2008
Professor of Meteorology, Dept. of Geological & Atmospheric Sciences (courtesy
appt., 1983-
Professor of Agricultural Meteorology, Dept. of Agronomy, 1983-
Professor of Aerospace Engineering (courtesy appt.), Dept. Aerospace
Engineering 2007-
Associate Professor, 1976-1983
Assistant Professor, 1971-1976
Ames Laboratory, USDOE
Faculty Affiliate, 2008-
Research Assistant, 1967-1971

Additional Training

National Center for Atmospheric Research, Boulder, CO
Visiting Scientist, August 2007, Summer 1973
RisØ National Laboratory, Roskilde Denmark
Visiting Scientist, Summer 1988

Naval Postgraduate School, Monterey, CA
Visiting Scientist, 1983-1985
Cooperative Institute for Research in Environmental Sciences, University of Colorado
Research Associate, 1978-1979
Summer Institute in Space Physics
NASA, Columbia University, 1966

Fellowships

National Research Council Senior Postdoctoral Research Associateship, 1983-1985
National Science Foundation Faculty Professional Development, 1978-1979
National Collegiate Athletic Association Postgraduate Fellowship, 1966-67
National Science Foundation Traineeship, 1966-67

Honors and Awards

Honorary Doctor of Science Degree from Luther College 2014
Named Pioneer Hi-Bred Professor in Agronomy 2013-2016
Fellow, American Meteorological Society, 2012
Regents Award for Faculty Excellence, 2009
Member of authoring and review teams of periodic assessment reports of the
Intergovernmental Panel on Climate Change cited as co-winner of the 2007 Nobel
Peace Prize
Iowa Educational Technology Showcase Award, Iowa Educational Technology Training
Institute and Iowa Department of Education, 1996
Distinguished Service Award, Luther College, 1996
Research Excellence Award, College of Liberal Arts & Sciences, ISU, 1994
Faculty Citation, ISU, 1991
Fellow, Iowa Academy of Science, 1989

Professional Affiliations and Offices

University Corporation for Atmospheric Research
Member, Board of Trustees, 2010-2016
Chair, Personnel Committee, 2012-2016
Member, University Relations Committee, 2000-03
Member, Unidata Policy Committee, 2004-2008
Association of Public and Land-grant Universities
Board on Oceans, Atmosphere and Climate
Co-chair, 2012 - 2013
American Meteorological Society
Commissioner for Education and Human Resources, 2009-2012
Associate Editor, *Journal of Applied Meteorology and Climatology*, 2005-
Committee on Artificial Intelligence Applications to Environmental Science,
1990-1992
Board on Higher Education: Member, 1983-89; Chair, 1986-89

Chair and Organizer, 14th Biennial Meeting of Heads and Chairs of Programs in Atmospheric, Oceanic, Hydrologic and Related Sciences. Boulder CO, 14-15 October 2004.
Chair and Organizer, Sixth Biennial Meeting of Heads and Chairs of Departments of Atmospheric Science, Boulder, CO (1988)
Chair and Organizer, Fifth Biennial Meeting of Heads and Chairs of Departments of Atmospheric Science, Boulder, CO (1986)

Elsevier Publishers

Atmospheric Science Editor, *Earth Science Reviews*, 1997-
American Association for the Advancement of Science, Member
American Geophysical Union, Member

National and International Professional Activities

Invited Participant, *Assessing Climate Risks to Midwest Infrastructure Workshop*, Argonne National Lab, July 25 - 26, 2019.
Invited Keynote Speaker, Climate Change - The Facts. *Canada-United States Law Institute 43rd Annual Conference: Can the United States and Canada cooperate on Climate Change?* Case-Western Reserve University School of Law, Cleveland, OH. 21 March 2019
Invited Speaker (all expenses paid), *2018 International Conference on Protective Forests (Shelterbelts, Windbreaks, and Water & Soil Conservation Forests)*, August 2018, Shenyang, P.R.China — *Commemorate the 40th Anniversary of Three-North Afforestation Program (ICPF 2018)*
Invited Co-author, *Climate Change Indicators for Agriculture*, USDA Office of the Chief Economist, report to be issued end of 2019
Invited presenter, *Symposium on Toward an Open Science Enterprise: Focus on Stakeholders*. National Academies of Science, Engineering and Medicine. Washington DC. September.
Chapter Co-Author, Midwest Chapter, *4th US National Climate Assessment*, 2016-2018
Member, External Review Committee, Missouri EPSCoR program, 2015-2020
Member, External Review Committee, School of Natural Resources, University of Nebraska, Lincoln. 2015
Panelist, White House release of the *3rd National Climate Assessment*, White House Executive Office Building. May 2014
Member, Program Review Committee, University of Arizona Atmospheric Science Department, 2014
Member, Program Review Committee, Computing, Environmental, and Life Sciences Directorate, Argonne National Laboratory, 2013
Invited presenter, US Report on Food Security and Climate Change: Agriculture Futures. *International Conference on Climate Change and Food Security*. Chinese Academy of Agricultural Sciences, Beijing, China. (November 2011)
Member, External Review Committee, Kansas EPSCoR program, 2012
Member, Program Review Committee, PHD Program in Environmental Resources and Policy, Southern Illinois University, 2012

Coordinating Lead Co-Author, Agriculture Chapter, *3rd US National Climate Assessment*, 2011-2014

Co-organizer (with S. Fales, ISU, and M. Sivakumar, World Meteorological Organization): *Enhancing Information Flow for Global Food Security in the Face of Climate Change*, American Association for the Advancement of Science, Vancouver, Feb 2012

Co-organizer, *Ninth Annual Climate Prediction Applications Science Workshop*, Mar 1-4, 2011, Des Moines. Sponsored by the National Oceanic and Atmospheric Administration Climate Programs Office.

Program Reviewer, St. Louis University Meteorology Program, 2010

Program Reviewer, St. Cloud State University Meteorology Program, 2009

Member and Provocateur, Workshop hosted by the BASC Committee on *Progress and Priorities of US Weather Research and Research-to-Operations Activities*, Wood Hole, 2009

Convenor, Communicating Information for Decision-Makers: Climate Change at the Regional Scale. *Climate Change: Science and Solutions. 8th National Conference on Science, Policy, and the Environment*. National Council for Science and the Environment. Co-convenors: Linda Mearns, National Center for Atmospheric Research; Hannah Campbell, NOAA. January 2008.

Member, National Research Council (NRC) study committee entitled *Developing Mesoscale Meteorological Observational Capabilities to Meet Multiple National Needs*, 2007-08

Member, Organizing Committee, *Bioeconomy Conference*. Iowa State University, September 2008.

Member, Organizing Committee, *Corn and Climate Workshop*. Iowa State University, September 2008

Member, review team for US Climate Change Science Program Synthesis and Assessment Product 4.3, *The Effects of Climate Change on Agriculture, Land Resources, Water Resources, and Biodiversity*. (2007)

Member, National Technical Advisory Committee, the National Institute of Global Environmental Change of the Department of Energy, 2004-2005

Chair and Organizer, *14th Biennial Meeting of Heads and Chairs of Programs in Atmospheric, Oceanic, Hydrologic and Related Sciences*. Boulder CO, 14-15 October 2004.

Member, secretary, chair, National Technical Advisory Committee, the National Institute of Global Environmental Change of the Department of Energy, 1998-2002

Organizer, American Association for the Advancement of Science Symposium entitled "*Effect of Global Change on Vegetation and Crops*", AAAS Annual Meeting, San Francisco. (1989)

Licenses/Certification

Certified Consulting Meteorologist, American Meteorological Society, 1984-

Peer-Reviewed Publications

2011-2020

- Zhou, Xinhua, Tian Gao, Xiaojie Zhen, Eugene S. Takle, Andrew E. Suyker, Tala Awada, Jane Okalebo, and Jiaojun Zhu, 2020: Air temperature equation derived from sonic temperature and water vapor mixing ratio for air flow sampled through closed-path eddy-covariance flux systems. *Atmos. Meas. Tech.* (in review)
- Rajewski, Daniel, Eugene Takle, Andy VanLoocke, and Samantha Purdy, 2020: Observations show that wind farms substantially modify the atmospheric boundary layer thermal stratification transition in the early evening. *Geophys. Res. Lett.* (accepted).
- Takle, Eugene S, and William J. Gutowski, Jr., 2020: Iowa's agriculture is losing its Goldilocks climate. *Physics Today* **73**, 2, 26-33. <https://doi.org/10.1063/PT.3.44>.
- Kristovich, David A. R., Eugene S. Takle, George S. Young, and Ashish Sharma, 2019: *100 Years of Progress in Mesoscale Planetary Boundary Layer Meteorological Research*. AMS Monographs 2018, Chapter 19, 19.1-19.41. <https://doi.org/10.1175/AMSMONOGRAPHS-D-18-0023.1>
- Cai, Bin, Phuong Vo, Sri Sritharan, and Eugene S. Takle, 2019: An evaluation of wind energy production at elevated hub heights. To be submitted to *Applied Energy*
- Cai, Bin, Sri Sritharan, Eugene S. Takle, and Chris Milliren, 2019: Quantifying the benefits of tall wind turbine towers in the U. S. wind-rich regions. To be submitted to the *Wind Energy* journal
- Cai, Bin, Sri Sritharan, and Eugene S. Takle, 2019: Potential for increasing wind generated electricity in the U. S. southeastern region. To be submitted to *Energies* or a comparable wind-engineering journal.
- Sun, J., E. S. Takle, and O. Acevedo, 2019: Revisiting Monin-Obukhov Similarity Theory for momentum transport. *Boundary-Layer Meteorology*. (in review)
- Walsh, M.K., P. Backlund, L. Buja, A. DeGaetano, E. Marshall, R. Melnick, L. Prokopy, E. Takle, D. Todey, and L. Ziska, 2019: Climate Indicators for Agriculture. USDA Technical Bulletin XXXX. Washington, DC. DOI XXXX. XX pages. DOI XXXX. (in review)
- Zhao, Yang, Brad Richardson, Eugene Takle, Lilong Chai, David Schmitt, Hongwei Xin, 2019: Airborne transmission may have played a role in the spread of 2015 highly pathogenic avian influenza outbreaks in the United States. *Scientific Reports*. Nature Research. <https://rdcu.be/BOEQ0>
- Brandle, James R., Eugene Takle, and Xinhua Zhou, 2019: Windbreak practices. In Garrett, H.E., W. J. Rietveld, and R. F. Fisher, eds., *North American Agroforestry*. Third Revision (in press)
- Takle, E. S. (Contributing author), 2017: Volume I. *Climate Science Special Report* (released November 2017). <https://science2017.globalchange.gov/>
- Lemos, Maria Carmen, Brent Lofgren, Todd A. Ontl, John Posey, Kim Stone, Eugene Takle, and Dennis Todey, 2018: Volume II. *Climate Change Impacts, Risks, and Adaptation in the United States*. Midwest Chapter: <https://nca2014.globalchange.gov/report/regions/midwest>.

- Takle, E. S., D. A. Rajewski, and S. I. Purdy, 2019: The Iowa Atmospheric Observatory: Revealing the unique boundary-layer characteristics of a wind farm. *Earth Interactions* 23 (2). <https://doi.org/10.1175/EI-D-17-0024.1>
- Takle, E. S., 2017: Climate. *In* M. Perrow, ed., 2017: *Wildlife and Wind Farms – Conflicts and Solutions. Volume I. Onshore Potential Effects*. Pelagic Publishing. 298 pp. ISBN 9781784271190.
- Jahn, David E., Eugene S. Takle, and William A. Gallus, Jr., 2017: Wind ramp forecast sensitivity to boundary layer scheme closure parameters. *Boundary-Layer Meteorology* **164**, 475-490. DOI 10.1007/s10546-017-0237-2.
- Jahn, D.E., Takle, E.S. and Gallus, W.A., 2017: Improving wind-ramp forecasts in the stable boundary layer. *Boundary-Layer Meteorology*, **163**, 423-446. Doi.org/10.1007/s10546-017-0237-2.
- Rajewski, Daniel A., Eugene S. Takle, John H. Prueger, and Russell K. Doorenbos, 2016: Toward understanding the physical link between turbines and microclimate impacts from *in situ* measurements in a large wind farm. *J. Geophys. Res. Atmos.*, 121, doi:10.1002/2016JD025297
- Chen, T.-C., J-D. Tsay, M. C. Yen, and E. S. Takle, 2016: A forecast advisory for afternoon thunderstorm occurrence in the Taipei Basin during summer developed from diagnostic analysis. *Weather and Forecasting* . DOI:<http://dx.doi.org/10.1175/WAF-D-15-0082.1>
- Chen, T.-C., J-D. Tsay, M. C. Yen, and E. S. Takle, 2016: Interannual variation of the summer rainfall in the Taipei Basin. *J. Appl Meteorol. Climatol.* DOI:<http://dx.doi.org/10.1175/JAMC-D-15-0256.1>
- Prokopy, L. S., C. E. Hart, R. Massey, M. Widhalm, J. Klink, J. Andresen, J. Angel, T. Blewett, O. C. Doering, R. Elmore, B. J. Gramig, P. Guinan, B. L. Hall, A. Jain, C. L. Knutson, M. C. Lemos, L. W. Morton, D. Niyogi, R. Power, M. D. Shulski, C. X. Song, E. S. Takle, and D. Today, 2015: Using a team survey to improve team communication for enhanced delivery of agro-climate decision support tools. *Agricultural Systems*, **138**, 31-37. <http://dx.doi.org/10.1016/j.agsy.2015.05.002>
- Vanderwende, Brian J., Julie K. Lundquist, Michael E. Rhodes, Eugene S. Takle, and Samantha Irvin, 2015: Observing and simulating the summertime low-level jet in central Iowa. *Mon. Wea. Rev.*, **143**, 2319-2339.
- Dai, Shuwei, Martha D. Shulski, Kenneth G. Hubbard, and Eugene S. Takle, 2015: A spatiotemporal analysis of Midwest U. S. temperature and precipitation trends during the growing season from 1980 to 2013. *Int'l. J. Climatol.* DOI: 10.1002/joc.4354
- Niyogi, Dev, Xing Liu, Jeff Andresen, Yang Song, Atul Jain, Olivia Kellner, Eugene S. Takle, and Otto C. Doering, 2015: Crop models can capture the impacts of climate variability on corn yield. *Geophys. Res. Lett.*, **42**, 3356-3363. DOI: 10.1002/2015GL063841.
- Haigh, Tonya, Eugene Takle, Jeffrey Andresen, Melissa Widhalm, J. Stuart Carlton, and Jim Angel, 2015: Mapping the decision points and climate information use of agricultural producers across the U.S. Corn Belt. *Climate Risk Management*, **7**, 20-30.

- Takle, E S., D. A. Rajewski, J. K. Lundquist, W. A. Gallus, Jr., and A. Sharma, 2014: Measurements in support of wind farm simulations and power forecasts: The Crop/Wind-energy Experiments (CWEX). *The Science of Making Torque From Wind, 2014*. Journal of Physics: Conference Series, **524** (2014) 012174 doi:10.1088/1742-6596/524/1/012174 [Available online at <http://iopscience.iop.org/1742-6596/524/1/012174>]
- Lundquist, Julie K., Eugene S. Takle, Matthieu Boquet, Branko Kosović, Michael E. Rhodes, Daniel Rajewski, Russell Doorenbos, Samantha Irvin, Matthew L. Aitken, Katja Friedrich, Paul T. Quelet, Jiwan Rana, Clara St. Martin, Brian Vanderwende, and Rochelle Worsnop, 2014: Lidar observations of interacting wind turbine wakes in an onshore wind farm. *The Science of Making Torque From Wind, 2014*. [Available online at <http://iopscience.iop.org/1748-9326/7/1/014005>]
- Chen, Tsing-Chang, Ming-Cheng Yen, Jenq-Dar Tsay, Chi-Chang Liao, Eugene S. Takle, 2014. Impact of the afternoon thunderstorm on the land-sea breeze in the Taipei Basin during summer: An experiment. *J. Clim. Appl. Meteor.*, **53**, 1714-1738.
- Kalvelage, Kelly, Ulrike Passe, Shannon Rabideau, and Eugene S. Takle, 2014: Changing climate: The effects on energy demand and human comfort. *Energy and Buildings*, **76**, 373-380. <http://dx.doi.org/10.1016/j.enbuild.2014.03.009>
- Rajewski, D.A., Eugene S. Takle, Julie K. Lundquist, John H. Prueger, Michael E. Rhodes, Richard Pfeiffer, Jerry L. Hatfield, Kristopher K. Spoth, Russell K. Doorenbos, 2014: Changes in fluxes of heat, H₂O, and CO₂ caused by a large wind farm. *Agric. and For. Meteor.*, **194**, 175-187. DOI: 10.1016/j.agrformet.2014.03.023
- Walton, R. A., E. S. Takle, and W. A. Gallus, Jr., 2014: Characteristics of 50 – 200 m winds and temperatures derived from an Iowa tall tower network. *J. Appl. Meteor. Climatol.*, **53**, 2387-2393. doi: <http://dx.doi.org/10.1175/JAMC-D-13-0340.1>.
- Hatfield, J., G. Takle, R. Grotjahn, P. Holden, R. C. Izaurralde, T. Mader, E. Marshall, and D. Liverman, 2014: Ch. 6: Agriculture. *Climate Change Impacts in the United States: The Third National Climate Assessment*, J. M. Melillo, Terese (T.C.) Richmond, and G. W. Yohe, Eds., U.S. Global Change Research Program, 150-174. doi:10.7930/J02Z13FR. <http://nca2014.globalchange.gov/report/sectors/agriculture>
- Takle, E. S., 2014: Agricultural Meteorology and Climatology. In Gerald North, ed., *Encyclopedia of Atmospheric Science 2nd Edition*. ELSEVIER LTD, Oxford, UK.
- Takle, Eugene S., David Gustafson, Roger Beachy, Gerald C. Nelson, Daniel Mason-D’Croz, and Amanda Palazzo (2013). US Food Security and Climate Change: Agricultural Futures. *Economics: The Open-Access, Open-Assessment E-Journal*, Vol. 7, 2013-34. <http://dx.doi.org/10.5018/economics-ejournal.ja.2013-34>
- Takle, Eugene S., Christopher Anderson, Jeffrey Andresen, J R Angel, Roger Elmore, Benjamin Gramig, Patrick Guinan, Steven Hilberg, Doug Kluck, Raymond Massey, Dev Niyogi, Jeanne Schneider, Martha Shulski, Dennis Today, and

- Melissa Widhalm, 2014: Climate forecasts for corn producer decision-making. *Earth Interactions*, **18**, 1-8. doi: <http://dx.doi.org/10.1175/2013EI000541.1>
- Mearns, L. O., S. Sain, L.R. Leung, M.S. Bukovsky, S. McGinnis, S. Biner, D. Caya, R.W. Arritt, W. Gutowski, E. Takle, M. Snyder, R.G. Jones, A.M.B. Nunes, S. Tucker, D. Herzmann, L. McDaniel, L. Sloan, 2013: Climate change projections of the North American Regional Climate Change Assessment Program (NARCCAP). *Climate Change Lett.* DOI 10.1007/s10584-013-0831-3
- Rajewski, D. A., Eugene S. Takle, Julie K. Lundquist, Steven Oncley, John H. Prueger, Thomas W. Horst, Michael E. Rhodes, Richard Pfeiffer, Jerry L. Hatfield, Kristopher K. Spoth, and Russell K. Doorenbos, 2013: CWEX: Crop/Wind-energy Experiment: Observations of surface-layer, boundary-layer and mesoscale interactions with a wind farm. *Bull. Amer. Meteor. Soc.*, **94**, 655-672. doi: 10.1175/BAMS-D-11-00240)
- Deppe, Adam J., William A. Gallus, Jr., and Eugene S. Takle, 2013: A WRF ensemble for improved wind speed forecasts at turbine height. *Wea. Forecasting*, **28**, 212–228. doi: <http://dx.doi.org/10.1175/WAF-D-11-00112.1>
- Walthall, C.L., J. Hatfield, P. Backlund, L. Lengnick, E. Marshall, M. Walsh, S. Adkins, M. Aillery, E.A. Ainsworth, C. Ammann, C.J. Anderson, I. Bartomeus, L.H. Baumgard, F. Booker, B. Bradley, D.M. Blumenthal, J. Bunce, K. Burkey, S.M. Dabney, J.A. Delgado, J. Dukes, A. Funk, K. Garrett, M. Glenn, D.A. Grantz, D. Goodrich, S. Hu, R.C. Izaurralde, R.A.C. Jones, S-H. Kim, A.D.B. Leaky, K. Lewers, T.L. Mader, A. McClung, J. Morgan, D.J. Muth, M. Nearing, D.M. Oosterhuis, D. Ort, C. Parmesan, W.T. Pettigrew, W. Polley, R. Rader, C. Rice, M. Rivington, E. Rosskopf, W.A. Salas, L.E. Sollenberger, R. Srygley, C. Stöckle, E.S. Takle, D. Timlin, J.W. White, R. Winfree, L. Wright-Morton, L.H. Ziska, 2012: Climate Change and Agriculture in the United States: Effects and Adaptation. USDA Technical Bulletin 1935. Washington, DC. 186 pages.
- Basu, Nandita B., Priyanka Jindal, Keith E. Schilling, Calvin F. Wolter; Eugene S. Takle, 2012: Evaluation of analytical and numerical approaches for the estimation of groundwater travel time distribution. *J. Hydrology*, **475**, 65-72.
- Rabideau, S. L., Ulrike Passe, and Eugene S. Takle, 2012: Exploring alternatives to the “Typical Meteorological Year” for incorporating climate change into building design. *ASHRAE Transactions*, **118**, 384–391.
- Mearns, Linda O., Ray Arritt, Sébastien Biner, Melissa S. Bukovsky, Seth McGinnis, Stephan Sain, Daniel Caya, James Correia Jr., Dave Flory, William Gutowski, Eugene S. Takle, Richard Jones, Ruby Leung, Wilfran Moufouma-Okia, Larry McDaniel, Ana M. B. Nunes, Yun Qian, John Roads, Lisa Sloan, and Mark Snyder, 2012: The North American Regional Climate Change Assessment Program: Overview of Phase I results. *Bull. Amer. Meteor. Soc.*, **93**, 1337-1362. doi: <http://dx.doi.org/10.1175/BAMS-D-11-00223.1>
- Gutowski, William J. Jr., Raymond W. Arritt, Sho Kawazoe, David M. Flory, Eugene S. Takle, Sébastien Biner, Daniel Caya, Richard G. Jones, René Laprise, L. Ruby Leung, Linda O. Mearns, Wilfran Moufouma-Okia, Ana M. B. Nunes, Yun Qian, John O. Roads, Lisa C. Sloan, and Mark A. Snyder., 2011: Regional, extreme monthly precipitation simulated by NARCCAP RCMs. *J. Hydromet* (doi: 10.1175/2010JHM1297.1)

Wu, Felicia, D. Bhatnagar, T. Bui-Klimke, I. Carbone, R. Hellmich, G. P. Munkvold, P. A. Paul, G. Payne, and E. S. Takle, 2011: Climate change impacts on mycotoxin risks in US maize. *World Mycotoxin J.*, **4**, 79-93.

2001-2010

Munang, R., M. Rivington, E. S. Takle, B. Mackey, I. Thiaw, and J. Liu, 2010: Climate information and capacity needs for ecosystem management under a changing climate. *Procedia Environmental Science*, **1**, 206-227.

Takle, E. S., M. Jha, E. Lu, R. W. Arritt, W. J. Gutowski, Jr., and the NARCCAP Team, 2010: Streamflow in the Upper Mississippi River Basin as simulated by SWAT driven by 20C results of global climate models and NARCCAP regional climate models. *Meteorologische Zeitschrift*, **19**, 341-346. DOI 10.1127/0941-2948/2010/0464.

Takle, E. S., 2010: Was climate change involved? Chapter 12. In Mutel, C. ed., *A Watershed Year: Anatomy of the Iowa Floods of 2008*. University of Iowa Press. 250 pp.

Lu, E., E. S. Takle, M. Jha, 2010: The relationships between climatic and hydrological changes in the Upper Mississippi River Basin: A SWAT and multi-GCM study. *J. Hydrometeor.*, **11**, 437-451. doi:10.1175/2009JHM1150.1.

Pan, Z., D. Andrade, M. Segal, J. Wimberley, N. McKinney, and E. S. Takle, 2010: Uncertainty in future soil carbon trends at a central US site under an ensemble of GCM scenario climates. *Ecological Modeling*, **221**, 876-881. doi:10.1016/j.ecolmodel.2009.11.013

Lu, Er, E. S. Takle, and Y. Wang, 2010: Spatial variabilities and their relationships of the trends of temperature, water vapor, and precipitation in the North American Regional Reanalysis. *J. Geophys. Res.*, **115**, D06110, 11pp. doi:10.1029/2009JD013192

Wang, S.-Y., T.-C. Chen, and E. S. Takle, 2011: Climatology of summer mid-tropospheric perturbations in the U.S. Northern Plains. Part II: Large-scale effects of terrain boundary layer on genesis. *Clim. Dynamics*, **36**, 1221-1237. DOI: 10.1007/s00382-010-0765-7.

Lu, E., and E. S. Takle: 2010: Concurrent variations of water vapor and temperature corresponding to the interannual variation of precipitation in the North American Regional Reanalysis, *J. Geophys. Res.*, doi:10.1029/2009JD012956.

Breakah, T., R. C. Williams, D. E. Herzmann, and E. S. Takle, 2010: The effects of utilizing accurate climatic conditions for mechanistic empirical pavement design, a case study. *Journal of Transportation Engineering*. doi:10.1061/(ASCE)TE.1943-5436.0000195]

Pryor, S. C., R. J. Barthelmie, D. T. Young, E. S. Takle, R. W. Arritt, D. Flory, W. J. Gutowski Jr., A. Nunes, and J. Roads, 2009: Wind speed trends over the contiguous United States, *J. Geophys. Res.*, **114**, D14105, doi:10.1029/2008JD011416.

Singh, Ranvir, Matthew J. Helmers, Amy Kaleita, and Eugene S. Takle, 2009: Potential impact of climate change on subsurface drainage in Iowa's subsurface drained landscapes. *Journal of Irrigation and Drainage Engineering*, July/August 2009,

- 459-466. DOI: 10.1061/ ASCE IR.1943-4774.0000009
- Wang, S.-Y., R. R. Gillies, E. S. Takle, and W. J. Gutowski, Jr., 2009: Characteristics of the Intermountain rainfall climatology simulated by the NARCCAP regional climate models. *Geophys. Res. Lett.*, **36**, 11, doi:10.1029/2009GL037930, 2009
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- Takle, E. S., and J. M. Brown, 1978: Note on the use of Weibull statistics to characterize wind speed data. *J. Appl. Meteor.*, **17**, 556-559.
- Takle, E. S., R. H. Shaw, and H. C. Vaughan, 1976: Low-level stability and pollutant trapping potential for a rural area. *J. Appl. Meteor.*, **15**, 36-42.
- Takle, E. S., 1976: Survey of graduate student compensation in atmospheric sciences. *Bull. Amer. Meteor. Soc.*, **57**, 1154.
- Takle, E. S., 1975: Teaching atmospheric dispersion. *J. Agron. Ed.*, **4**, 32-34.
- Takle, E. S., and J. L. Stanford, 1973: Radio frequency size effect measurement of the Fermi surface of thallium. *J. Physics F: Metal Physics*, **3**, 1956-1961.
- Lind, M. A., J. S. Hartman, E. S. Takle, and J. L. Stanford, 1972: Radio noise studies of several severe weather events in Iowa in 1971. *J. Atmos. Sci.*, **29**, 1220-1223.
- Stanford, J. L., M. A. Lind, and G. S. Takle, 1971: Electromagnetic noise studies of severe convective storms in Iowa: The 1970 storm season. *J. Atmos. Sci.*, **28**, 436-448.

Conference Presentations

- Takle, Eugene S., 2019: Climate Change - The Facts. *Canada-United States Law Institute 43rd Annual Conference: Can the United States and Canada cooperate on Climate Change?* Case-Western Reserve University School of Law, Cleveland, OH. [Invited keynote presentation] 21 March 2019
- Sun, Jielun, Eugene S. Takle, and Otevio. Ocevedo, 2019: Revisiting Monin-Obukhov Similarity Theory. EGU2019-6222. EGU General Assembly 2019. Vienna, Austria.
- Takle, E. S., 2018: Recent Advances and Current Challenges in Understanding Shelterbelt Microclimates through Modeling and Measurements. *International Conference on Protective Forests*. Shenyang, P.R. China. August 1-5 (Invited).
- Takle, E. S., 2018: Diagnosis of Wind Farm Power Gain and Loss due to Wake Interactions, Electric Power Research Center Annual Meeting, Ames IA. May 2018. (invited)
- Takle, E. S., Bin Cai, and Sri Sritharan, 2018: Planning for Analysis of Tall-Turbine Power Production and AWAKEN. *Hexcrete Joint Industry Partnership (JIP) Workshop*. Ames. March. (Invited).
- Takle, E. S., 2017: Fostering Open Science in Meteorological Research, Operations, and Education. *Symposium on Toward an Open Science Enterprise: Focus on Stakeholders*. National Academies of Science, Engineering and Medicine. Washington DC. September. (Invited)
- Takle, E. S., 2017: Scientific Evidence for Climate Change and Impacts on Human Health. *Workshop on Health impacts of Climate Change and Air Pollution*. Des Moines University. March. (Invited)
- Takle, E. S., 2017: Preparing for Iowa's Climate Future. *Iowa Academy of Science Annual Meeting*. Cedar Falls. (Invited)

- Takle, E. S., B. Cai, and S. Sritharan, 2017: Wind energy potential in the Midwest US at higher hub heights. *Hexcrete Joint Industry Partnership (JIP) Workshop*. Ames. July. (Invited)
- Takle, E. S., 2017: Wind Energy: An outdoor laboratory has been established to collect reliable wind speed and turbulence data for use with computational models of wind turbine systems. Poster displayed at the EPSCoR Legislator Breakfast at the Iowa Statehouse.
- Takle, E. S., D. A. Rajewski, and S. L. Irvin, 2017: Identical twin towers for studies of natural turbulence and wind farm boundary layers. *8th Conf. on Wea., Climate, Water and the New Energy Economy*, 23 Jan., Amer. Meteor. Soc., Seattle, WA.
- Takle, 2017: Climate Change and Invasive Species in the Midwest. *Iowa Invasive Species Conference*. Honey Creek Resort, Rathbun Lake, Moravia, IA. March. (Invited)
- Takle, E. S., D. A. Rajewski, S. L. Purdy, J. Sun, and S. Zilitinkevich, 2017: Exchanges to surface and boundary layer reconsidered: Introducing FaNTASTIC-1. *International Conference on Future Technologies for Wind Energy*. Boulder CO, October.
- Takle, E. S., B. Cai, and S. Sritharan, 2017: Wind energy potential for six locations in the Midwest US at higher hub heights. *International Conference on Future Technologies for Wind Energy*. Boulder CO, October 2017. (Invited)
- Rajewski, D. A., E. S. Takle, and S. L. Purdy, 2017: Tall tower measurements of wake loss characteristics within a low-density wind farm. *International Conference on Future Technologies for Wind Energy*. Boulder CO, October 2017.
- Takle, E. S., 2016: Future Climate Scenarios for Semiarid Farming Regions of North America. *Global Dryland Cropping Systems Adaptation to Climate Variability Symposium Semiarid Dryland Cropping Systems Community*, American Society of Agronomy Annual Meeting. Phoenix, AZ, November. (invited)
- Takle, E. S., 2016: Preparing for Climate Extremes in the North Central US. *North Central Water Network Webinar*, February.
- Takle, E. S., D. Herzmann, and D. A. Rajewski, 2016: Power-Production Diagnostic Tools for Low-Density Wind Farms with Applications to Wake Steering. *Amer. Geophys Union Fall Meeting*. San Francisco. December (poster)
- Takle, Eugene S., Bin Cai, Sri Sritharan, 2016: Wind Energy Potential in the Midwest at Higher Hub Heights. *Hexcrete Commercialization Workshop*. Denver, CO, 23 June (invited).
- Takle, Eugene S., Daryl Herzmann, and Dan Rajewski, 2016: Wind-farm power production diagnostic tools with applications to wake steering. *National Renewable Energy Laboratory (DOE)*, Boulder CO. (Invited)
- Jahn, D. E., E. S. Takle, W. A. Gallus, 2016: Improving Numerical Wind Forecasts of Wind Ramps at 100m Height in the Stable Boundary Layer. Oral pres. *2016 Wind Energy Research Workshop*, 15-16 Mar., Lowell, MA.
- Jahn, D. E., E. S. Takle, W. A. Gallus, 2016: Improving Numerical Wind Forecasts of Wind Ramps at 100-m Height in the Stable Boundary Layer. Oral pres. *7th Conf. on Wea., Climate, Water and the New Energy Economy*, 11-14 Jan., Amer. Meteor. Soc., New Orleans, LA.

- Jahn, D. E., E. S. Takle, W. A. Gallus, 2015: Sensitivity of Numerical Wind Forecasts to Variations in the Closure Constants of the MYNN Boundary Layer Scheme in Context of Low-Level Jet Cases within a Stable Boundary Layer. Poster. *3rd Int. Conf. on Energy & Meteor*, 22-26 June, Boulder, CO.
- Niyogi, D., Xing Liu, Eugene Takle, Christopher Anderson, Jeff Andresen, Gopal Alagarswamy, Benjamin Gramig, and Otto Doering, 2015: Impacts of climate change on corn yield and the length of corn growing season in U.S. Corn Belt. *Amer. Geophys. Union Fall Meeting*, San Francisco. Available online at <https://agu.confex.com/agu/fm15/meetingapp.cgi/Paper/86502>.
- Anderson, Christopher, Eugene S Takle, Witold Krajewski, Ricardo Mantilla and Felipe Quintero, 2015: Translating climate projections for bridge engineering. *Amer. Geophys. Union Fall Meeting*, San Francisco. Available online at <https://agu.confex.com/agu/fm15/meetingapp.cgi/Paper/79093>.
- Chen, Tsing-Chang, Jenq-Dar Tsay, and Eugene S. Takle, 2015: Interannual variation of summer rainfall in the Taipei Basin caused by the impact of ENSO on the land-sea breeze activity. EGU General Assembly. *Geophys. Res. Abs.* 17, EGU2015-8339.
- Rajewski, Daniel A., Eugene S. Takle, Julie K. Lundquist, Samantha L. Irvin, and Russell K. Doorenbos, 2015: Spatial characteristics of power variability from a large wind farm in Iowa during the 2013 Crop/Wind Energy Experiment (CWEX-3). *Sixth Conference on Weather, Climate, and the New Energy Economy*. American Meteorological Society. Phoenix, AZ
- Haigh, Tonya, Eugene Takle, Jeffrey Andresen, Melissa Widhalm, J. Stuart Carlton, and Jim Angel, 2015: Mapping the decision points and climate information use of agricultural producers across the U.S. Corn Belt. *Climate Prediction Applications Workshop*. March. [Available at <https://unl.box.com/s/xwj985nc1o1uci44vemhr2x3tuv5gav>]
- Lundquist, Julie K., E. S. Takle, M. Boquet, B. Kosovic, M. E. Rhodes, D. A. Rajewski, R. K. Doorenbos, S. Irvin, M. Aitken, K. Friedrich, P. T. Quelet, J. Rana, C. St. Martin, B. J. Vanderwende, and R. Worsnop, 2014: Lidar observations of the variation of wind turbine wakes with inflow conditions in an onshore wind farm. *21st Symposium on Boundary Layers and Turbulence*. Amer. Meteorol. Soc. Leeds, UK.
- Lundquist, J. K., E.S. Takle, M. Boquet, B. Kosovic, M.E. Rhodes, D. Rajewski, R. Doorenbos, S. Irvin, M.L. Aitken, K. Friedrich, P.T. Quelet, J. Rana, C. St. Martin, B. Vanderwende, and W. Rochelle, 2014: Lidar observations of interacting wind turbine wakes in an onshore wind farm. *European Wind Energy Association 2014*. 33–36.
- Jahn, David E., W. A. Gallus Jr., and E. S. Takle, 2014: Evaluation of the MYNN PBL scheme closure constants for low-level jet events in a stable boundary layer. *21st Symposium on Boundary Layers and Turbulence*. American Meteorological Society. Leeds, UK.
- Walton, Renee, E. S. Takle, and W. A. Gallus, Jr., 2014: High wind shear and ramp events within the rotor layer across the Iowa Tall Tower Network. *Fifth Conference on Weather, Climate, and the New Energy Economy*. American Meteorological Society. Atlanta GA

- Selvaraj, S., A. Chaves, E. Takle and A. Sharma, “Numerical Prediction of Surface Flow Convergence Phenomenon in Windfarms” in *Proc. of the Conference on Wind Energy Science and Technology, RUZGEM, Ankara, Turkey, Oct 3-4, 2013*.
- Takle, E. S., 2013: Climate Effects on Agriculture. *25th Conference on Climate Variability and Change*. American Meteorological Society Annual Meeting. Austin, TX. 13 January 2013.
- Takle, E. S., 2013: My observations of Danish Innovation in doing science, learning new things, and living an interesting life. Presented at *Innovation - The Danish Way*. Sponsored by the Danish American Heritage Society. Des Moines, IA
- Takle, E. S., and C. J. Anderson, 2013: Applications of RCMs for Understanding Climate Change in the Central US. *Regional Climate Modeling to Improve Climate Variability and Change Projections at the Local Scale*. American Meteorological Society Annual Meeting. Austin, TX. January 2013.
- Takle, E. S., 2013: Adapting to Climate Change in Iowa: Past and Future. *Agriculture and Natural Resources Extension Lunch & Learn*. 18 January 2013.
- Takle, E. S., 2013: Impact of Weather Extremes and Climate Change on Midwest Agriculture. *North American Millers Association Division Meetings*, Palm Coast, FL, 25 March 2013.
- Takle, E. S., 2013: Impact of Weather Extremes and Climate Change on Midwest Agriculture. *North American Millers Association Division Meetings*, Palm Coast, FL, 25 March 2013.
- Takle, E. S., 2013: Climate Change of Importance to Agriculture: What Does the Science Say? *25 x 25 Alliance Media Presentation*, 2 April 2013
- Takle, E. S., 2013: The National Climate Assessment Agriculture Chapter. *Great Plains Regional Town Hall Meeting. 2013 Draft Report Findings: Opportunities for Engagement in the Sustained Assessment*, University of Nebraska – Lincoln. Lincoln, NE. February 2013
- Takle, E. S., 2013: The National Climate Assessment Agriculture Chapter. *Midwest Regional Town Hall Meeting 2013 Draft Report Findings: Opportunities for Engagement in the Sustained Assessment*. University of Michigan, Ann Arbor, MI, February 2013
- Rajewski, D. A., E. S. Takle, J. H. Prueger, S. Oncley, J. K. Lundquist, T. W. Horst, M. E. Rhodes, R. L. Pfeiffer, J. L. Hatfield, K. K. Spoth, and R. Doorenbos, 2013: Wind Turbine Wake Investigation from Surface Measurements during the 2010 and 2011 Crop Wind-Energy EXperiments (CWEX-10/11). *Fourth Conference on Weather, Climate, and the New Energy Economy*. American Meteorological Society. Austin, TX.
- Takle, E. S., D. A. Rajewski, J. Prueger, Steven Oncley, J. K. Lundquist, Thomas W. Horst, Michael E. Rhodes, Richard Pfeiffer, Jerry L. Hatfield, Kristopher K. Spoth, Russell K. Doorenbos, 2013: CWEX-10/11: Overview of Results From the First Two Crop/Wind-Energy Experiments. *Fourth Conference on Weather, Climate, and the New Energy Economy*. American Meteorological Society. Austin, TX.
- Walton, Renee A., William A. Gallus, Jr., and Eugene S. Takle, 2013: Wind ramp events at turbine height – spatial consistency and causes at two Iowa wind farms.

- Energy Poster Session. *Fourth Conference on Weather, Climate, and the New Energy Economy*. American Meteorological Society. Austin, TX.
- Takle, E. S., D. A. Rajewski, J. Prueger, Steven Oncley, J. K. Lundquist, Thomas W. Horst, Michael E. Rhodes, Richard Pfeiffer, Jerry L. Hatfield, Kristopher K. Spoth, Russell K. Doorenbos, 2012: CWEX-10/11: Overview of Results From the First Two Crop/Wind-Energy Experiments. *American Geophysical Union Fall Meeting*, San Francisco.
- Rajewski, D. A., E. S. Takle, J. H. Prueger, S.P. Oncley, T. W. Horst, R. Pfeiffer, J. L. Hatfield, K. K. Spoth, R.K. Doorenbos, 2012: Evaluation of surface energy and carbon fluxes within a large wind farm during the CWEX-10/11 Crop Wind-Energy eXperiments. *American Geophysical Union Fall Meeting*, San Francisco.
- Hohenstein, W., D. Gustafson, P. Backlund, and E. S. Takle, 2012: The 3rd US National Climate Assessment: Technical Inputs on the Agricultural Sector. *Side Event. UN Framework Convention on Climate Change Conference of the Parties-18*. Doha Qatar. November 2012.
- Takle, E. S., 2012: Climate Trends in the Corn Belt. *Carbon, Energy, and Climate Conference*. Michigan State University W. K. Kellogg Biological Station, Hickory Corners, MI. September 2012
- Takle, E. S., 2012: The drought of 2012 in the US Midwest: historical perspectives. *Side Event. UN Framework Convention on Climate Change Conference of the Parties-18*. Doha Qatar. November 2012. (Invited presentation)
- Rajewski, D. R., E. S. Takle, T. W. Horst, S. P. Oncley, J.K. Lundquist, M. E. Rhodes, and K. K. Spoth, 2012: Crop-Wind-Energy Experiment 2011 (CWEX11). *16th Symposium on Meteorological Observation and Instrumentation*. Amer. Meteorol. Soc. 23-26 January. New Orleans.
- Clark, Richard, S. Ackerman, D. Blockstein, J. Fellows, L. O. Mearns, R. Pandya, E. S. Takle, and D. J. Wuebbles, 2012: An alliance to develop a workforce of community climate-change advisors. *21st Symposium on Education*. Amer. Meteorol. Soc. 23-26 January. New Orleans.
- Takle, E. S., S. Rabideau, and U. Passe, 2011: Use of NARCCAP Data to Develop a “Typical Meteorological Year” to Incorporate Climate Change into Building Design. *American Geophysical Union Fall Meeting*, San Francisco.
- Takle, Eugene S., Dave Gustafson, Roger Beachy, Gerald C. Nelson, Daniel Mason-D’Croze, and Amanda Palazzo, 2011: US Food Security and Climate Change: Agriculture Futures. *International Conference on Climate Change and Food Security*. Chinese Academy of Agricultural Sciences, Beijing, China. (Invited presentation)
- Rabideau, S. L., U. Passe, and E. S. Takle, 2012: Exploring Alternatives to the “Typical Meteorological Year” for Incorporating Climate Change into Building Design. *ASHRAE 2012 Winter Conference*. Chicago, 21-25 January.
- Takle, E. S., D. A. Rajewski, J. H. Prueger, J. K. Lundquist, M. Aitken, M. E. Rhodes, A. J. Deppe, F. E. Goodman, K. C. Carter, L. Mattison, S. L. Rabideau, A. J. Rosenberg, C. L. Whitfield, and J. Hatfield, 2010: Wind and flux measurements in a windfarm co-located with agricultural production. Presented at the *American Geophysical Union Fall Meeting*, San Francisco. (Invited presentation)

- Rhodes, M. E., M. L. Aitken, J. K. Lundquist, E. S. Takle, and J. Prueger, 2010: Effect of wind turbine wakes on cropland surface fluxes in the US Great Plains during a Nocturnal Low Level Jet. Presented at the *American Geophysical Union Fall Meeting*, San Francisco.
- Gallus, W. A., A. J. Deppe, and E. S. Takle, 2010: Design of a WRF Ensemble for Improved Wind Forecasts at Turbine Height. Presented at the *American Geophysical Union Fall Meeting*, San Francisco.
- Gillies, R. R., S. Wang E. S. Takle, W. J. Gutowski, 2010: Precipitation in the Intermountain Region simulated by the NARCCAP regional climate models. Presented at the *American Geophysical Union Fall Meeting*, San Francisco
- Pan, Z., Andrade, J. Wimberley, N. McKinney, M. Segal, and E. S. Takle, 2009: Future trend of soil organic carbon over the U.S. Midwest cropland. *Joint Special Symposium on Biogeochemical Cycling of Trace Gases and Aerosols*. Amer. Meteor. Soc., Jan 11-15, Phoenix.
- Jha, M., S. S. Rabotyagov, C. L. Kling, P. W. Gassman, and E. S. Takle, 2009: Effect of potential future climate change on cost-effective nonpoint source pollution reduction strategies in the Upper Mississippi River Basin. *International Scientific Congress on Climate Change: Global Risks, Challenges and Decisions*. Copenhagen, DK
- Takle, E. S., 2009: Impacts of climate change and climate variability on agriculture in the US Midwest. *International Scientific Congress on Climate Change: Global Risks, Challenges and Decisions*. Copenhagen, DK.
- Lu, E., E. S. Takle, M. Jha, and the NARCCAP Team, 2009: Changes of climate and hydrological cycle in the Upper Mississippi River Basin. *21st Climate Variability and Change Conference*. Amer. Meteorol. Soc., Phoenix, AZ.
- Takle, E. S., M. Jha, E. Lu, R. W. Arritt, W. J. Gutowski, Jr., and the NARCCAP Team, 2009: Streamflow in the Upper Mississippi River Basin as simulated by SWAT driven by 20C results of NARCCAP regional climate models. *2nd International Lund RCM Workshop*. Lund, Sweden.
- Takle, E. S., S. C. Pryor, E. Lu, T. Andersen, A. Nunes, and the NARCCAP Team, 2009: Characteristics of wind speeds over the US from 1982-2004 as simulated by regional climate models. *21st Climate Variability and Change Conference*. Amer. Meteorol. Soc., Phoenix, AZ.
- Takle, E. S., 2009: Climate science and assessment of climate change for Iowa. *Iowa Climate Change Briefing and Discussion*. Des Moines. [Invited presentation]
- Takle E. S., M. Jha, E. Lu, R. W. Arritt, W. J. Gutowski, Jr. and the NARCCAP team, 2009: Steamflow in the Upper Mississippi River Basin as simulated by SWAT driven by 20C results of NARCCAP regional climate models. *Second Regional Climate Modeling Workshop*, Lund Sweden. (poster)
- Kaiser, M.S. and Takle, G., 2009: Statistical issues in regionalization of climate models. *Joint Statistical Meetings*, Washington D.C., August 2009. (Invited Paper)
- Pan, Z. D. Andrade, M. Segal, and E. Takle, 2009. Soil carbon budget over the U.S. Midwest cropland, 2ND NACP All-Investigator Meeting, San Diego, CA, February, 2009.

- Pan, Z. D. Andrade, J. Wimberley, N. McKinney, M. Segal, and E. Takle, 2009. Future trends of soil carbon in Midwest cultivate area. *89th American Meteorological Society Annual Meeting*, Phoenix, AZ, January 10-16, 2009.
- Takle, E. S., D. A. Rajewski, M. Segal, R. Elmore, J. Hatfield, J. H. Prueger, and S. E. Taylor, 2009: Interaction of turbine-generated turbulence with agricultural crops: conceptual framework and preliminary results. Presentation at *American Geophysical Union Fall Meeting*, San Francisco.
- Takle, E. S., 2008: Climate Change and Impact on Corn and Grain Quality. *North American Dry Millers Association Conference*, Peoria IL. [Invited]
- Takle, E. S., and NARCCAP Team Co-authors, 2008: NARCCAP: Future Scenarios of Regional Climates for Assessing Impacts of Climate Change. *Conference on Climate Impacts for Managing Risk*. Southeast Climate Consortium, Tampa FL. (poster)
- Takle, E. S., L. O. Mearns, and H. Campbell, 2008: Communicating Information for Decision-makers: Climate Change at the Regional Scale. Breakout Session, *8th Conference on Science Policy and the Environment*. National Council for Science and the Environment. 16-18 January, Washington, DC.
- Gutowski, W. J., S. S. Willis, J. C. Patton, B. R. Schwedler, R. W. Arritt, and E. S. Takle, 2007: Simulating the synoptic climatology of extreme precipitation events. *Bridging Studies of Weather and Climate* - Presidential Forum on *Climate Variability and Change Manifested by Changes in Weather*, at *Annual Meeting*, American Meteorological Society, San Antonio, TX, January 2007. [invited]
- Pan, Z. L. Xue, M. Segal, and E. Takle, 2007. Sensitivity of carbon dioxide fluxes to soil moisture in a coupled regional model, *The U.S. North America Carbon Program Investigator Meeting*, Colorado Springs, January 22-24, 2007.
- Takle, E. S., for the NARCCAP Team, 2007: The North American Regional Climate Change Assessment Program. *Midwestern Climate Workshop*, Indiana University, 15-17 October.
- Takle, E. S., S. C. Pryor, R. Barthelmie, T. K. Andersen, J. Correia, D. Flory, R. W. Arritt, and W. J. Gutowski, Jr., 2007: Trends in US surface winds over the last quarter of the 20C: Observations and model results. *Regional Climate I: Modeling, Detection, and Attribution of Climate Change Posters*. Fall Meeting, American Geophysical Union. San Francisco.
- Andersen, Theresa K., 2007: Climatology of surface wind speeds using a regional climate model. Senior Thesis, Meteorology Program. Iowa State University. 11 pp.
- Andersen, Theresa K., 2007: Climatology of surface wind speeds using a regional climate model. Iowa State University Atmospheric Science Undergraduate Research Symposium. Iowa State University. 3 December 2007.
- Wimberley, J., Z. Pan, M. Segal, E. Takle, and Q. Shi, 2007. Modeling of local and regional soil carbon balance under various agricultural managements, *American Geophysical Union Fall Meeting*, San Francisco, CA. Dec. 10-14, 2007.
- Pryor, S. C., R. J. Barthelmie, E. S. Takle, and T. K. Andersen, 2007: Historical trends in wind speeds from observational data, reanalysis output, and Regional Climate Model simulations over the continental USA. *European Geophysical Union Meeting*, Vienna.

- Takle, E. S., T.-C. Chen, and X. Wu, 2006: The role of coastal forests and trees for protecting against wind and salt spray. *Workshop on Coastal Protection in the Aftermath of the Indian Ocean Tsunami: What Role for Forests and Trees?* United Nations Food and Agricultural Organization (Rome). Khao Lak Thailand 28-31 August 2006. [Invited]
[<http://www.fao.org/forestry/site/coastalprotection/en/>]
- Takle, E. S., 2006: Designing shelterbelts for protection against wind and salt spray. National Central University, Taipei, Taiwan. 2 September August 2006. [Invited].
- R. Arritt, L O. Mearns, G. Boer, D. Caya, P. Duffy, F. Giorgi, W. J. Gutowski, I. M. Held, R. Jones, R. Laprise,, R.L. Leung, J. Pal, J. Roads, L. Sloan, R. Stouffer, G. Takle, and W. Washington, 2006: North American Regional Climate Change Assessment Program (NARCCAP): Producing Regional Climate Change Projections for Impacts Studies. *Fall Meeting*, American Geophysical Union,, San Francisco, CA, December 2006.
- Gutowski, W.J., C. Anderson, R. W. Arritt, Z. Pan, and E. S. Takle, 2006: Status of regional climate modeling Some recommendations for RegCNET. *Third ICTP Workshop on the Theory and Use of Regional Climate Models*, Trieste, Italy, 29 May - 9 June 2006. (invited)
- Takle, E. S., and Z. Pan, 2006: Climate change impacts on agriculture. *Third ICTP Workshop on the Theory and Use of Regional Climate Models*. International Centre for Theoretical Physics, Trieste, Italy 29 May – 9 June 2006. [Invited].
- Takle, E. S., B. Rockel, W. J. Gutowski, Jr., J. Roads, R. W. Arritt, I. Meinke, and C. Jones, 2006: Transferability Working Group (TWG) of the GEWEX Hydrometeorology Panel. *Third ICTP Workshop on the Theory and Use of Regional Climate Models*. International Centre for Theoretical Physics, Trieste, Italy 29 May – 9 June 2006. [Invited].
- Takle, E. S., 2006: Global education. *Third ICTP Workshop on the Theory and Use of Regional Climate Models*. International Centre for Theoretical Physics, Trieste, Italy 29 May – 9 June 2006. [Invited].
- Gutowski, W. J., R.W. Arritt, K. Kozak, J. Patton, and E. S. Takle, 2006: A Possible Constraint on Precipitation Intensity Changes under Greenhouse Warming. *Earth System Science Partnership Conferene: Global Environmental Change - Regional Challenges*, Beijing, China, 9 -12 November 2006.
- Gutowski, W.J., C. Anderson, R. W. Arritt, Z. Pan, and E. S. Takle, 2006: Status of regional climate modeling Some recommendations for RegCNET. *First ICTP West African Workshop on Regional Climate and Impacts*, Accra, Ghana, 16-20 January 2006. (invited)
- Takle, E. S., J. Roads, B. Rockel, W. J. Gutowski, Jr., R. W. Arritt, I. Meinke, C. G. Jones, and A. Zadra, 2006: Diurnal cycle of surface-flux probability distributions in regional climate models. *EGU Annual Meeting*.
- Takle, E. S., J. Roads, B. Rockel, W. J. Gutowski, Jr., R. W. Arritt, I. Meinke, C. G. Jones, and A. Zadra, 2006: Do regional climate models perform better on their home domains? A transferability intercomparison. *EGU Annual Meeting*.
- Pan, Z., L. Xue, E. S. Takle, and M. Segal (2006), Sensitivity of Carbon Budgets in the Continental U.S. to Soil Moisture in a Regional Ecosystem-Climate Coupled

- Model, *Regional to Continental-Scale Carbon Cycle Science*, AGU 2006 Fall Meeting, San Francisco, CA, 11-15 December, 2006.
- Takle, E. S., M. Jha, C. J. Anderson, and P. W. Gassman, 2006: Climate change impacts on the hydrology of the Upper Mississippi River Basin as determined by an ensemble of GCMs. *20th Conference on Hydrology*, Amer. Meteor. Soc. Atlanta GA.
- Gutowski, W. J., Jr., R. Arritt, S. Biner, G. Boer, D. Caya, P. Duffy, M. Giguere, F. Giorgi, I. Held, R. Jones, R. Laprise, R. Leung, L. Mearns, A. Nunes, J. Pal, Y. Qian, J. Roads, L. Sloan, M. Snyder, R. Stouffer, E. Takle, and W. Washington, 2005: Initial results from the North American Regional Climate Change Assessment Program. *16th Conference on Climate Variability and Change*. Amer. Meteor. Soc., San Diego.
- Mearns, L. O., R. W. Arritt, G. Boer, D. Caya, P. Duffy, F. Giorgi, W. J. Gutowski, I. M. Held, R. Jones, R. Laprise, L. R. Leung, J. Pal, J. Roads, L. Sloan, R. Stouffer, E. S. Takle, and W. Washington, 2005: NARCCAP, North American Regional Climate Change Assessment Program, A Multiple AOGCM and RCM Climate Scenario Project over North America. *16th Conference on Climate Variability and Change*. Amer. Meteor. Soc., San Diego.
- Arritt, R. W. , C. J. Anderson, W. J. Gutowski, E. S. Takle, D. Caya, C. G. Jones, J. J. Katzfey, J. W. Larson, R. Laprise, J. L. McGregor, J. Roads, and J. Taylor, 2005: Influences on predictability in multi-year regional climate simulations for the continental United States. *16th Conference on Climate Variability and Change*. Amer. Meteor. Soc., San Diego.
- Rockel, B., J. Roads, I. Meinke, W. J. Gutowski, R. Arritt, and E. S. Takle, 2005: ICTS (Inter-CSE Transferability Study): an application of CEOP data. *16th Conference on Climate Variability and Change*. Amer. Meteor. Soc., San Diego.
- Takle, E. S., M. Jha, Z. Pan, and R. Gu, 2005: Climate change and uncertainty of stream flow scenarios of the Upper Mississippi River Basin by use of a regional climate model. *19th Conference on Hydrology*. Amer. Meteor. Soc., San Diego.
- Mearns, L. O., R. Arritt, G. Boer, D. Caya, P. Duffy, F. Giorgi, W. Gutowski, I. Held, R. Jones, R. Laprise, R. Lueng, J. Pal, J. Roads, L. Sloan, R. Stouffer, E. Takle, and W. Washington, 2005: North American Regional Climate Change Assessment Program, A Multiple AOGCM and RCM Climate Scenario Project over North America. 85th AMS Annual Meeting, San Diego.
- Greenfield, T. M., E. S. Takle, B. J. Tentinger, J. J. Alamo, D. Burkheimer, and D. McCauley, 2004: Bridge frost occurrence and predict Sixth International Symposium on Snow Removal and Ice Control Technology. Spokane, WA.
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- Xu, D., D. Berleant, G. Takle, and Z. Pan, 2004: A better understanding of the effects of software defects in weather simulation. MM5 Workshop, Boulder CO.
- Takle, E. S., W. J. Gutowski, Jr., and R. W. Arritt, 2004: Transferability Working Group. Tenth Annual Meeting of the GEWEX Hydrometeorology Panel. Montevideo, Uruguay.
- Arritt, R. W., M. Jha, E. S. Takle, and R. Gu, 2004: Streamflow simulations for the Mississippi River Basin based on ensemble regional climate model simulations. *Methods and Applications of Ensemble Prediction for Hydrometeorology, AGU Fall Meeting*, San Francisco, CA.
- Pan, Z., E. S. Takle, L. Xue, and M. Segal, 2004: Crop phenology feedback to climate over the central US in a regional climate model. *Climate Feedback and Climate Dynamics, AGU Fall Meeting*, San Francisco, CA.
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- Takle, E. S., 2004: Predicting Heating/Cooling Degree Days 12 hours to 50 years in advance. *Workshop on New England High Resolution Temperature Program*. NOAA and Amer. Meteor. Soc., Sturbridge, MA (Invited presentation).

- Sorensen, E. K., and E. S. Takle, 2003: Learning through discussion and dialogue in computer supported collaborative networks. SITE 20033: *Society for Information Technology and Teacher Education International Conference*. Albuquerque NM. Invited address.
- Takle, E. S., Z. Pan, and W. Batchelor, 2003: Two-way coupling of crop-climate interactions in a regional climate model. *17th Conference on Hydrology*. Amer. Meteor. Soc., Long Beach.
- Jha, M., Z. Pan, E. S. Takle, and R. Gu, 2003: Climate change induced stream flow in the Upper Mississippi River Basin. *14th Symposium on Global Change and Climate Variations*. Amer. Meteor. Soc., Long Beach.
- Pan, Z., R. Horton, M. Segal, E. S. Takle, D. Herzmann, and D. Todey, 2003: Seasonal soil moisture prediction using a climate-plant-soil coupled agroecosystem water management model. *17th Conference on Hydrology*. Amer. Meteor. Soc., Long Beach.
- Temeyer, B. R., W. A. Gallus, E. S. Takle, T. M. Greenfield, and K. A. Jungbluth, 2003: Applications of a roadway frost prediction system in Iowa. *19th International Conference on Interactive Information Processing Systems (IIPS) for Meteorology, Oceanography, and Hydrology*. Amer. Meteor. Soc., Long Beach.
- Chen, T.-C., E. S. Takle, J.-H. Yoon, K. St. Croix, and P. Hsieh, 2003: Impacts on tropical South American rainfall due to changes in global circulation. *Conference on Southern Hemisphere Meteorology*, Amer. Meteor. Soc. New Zealand.
- Arritt, R. W., Z. Pan, E. S. Takle, C. J. Anderson, W. J. Gutowski, Jr., and J. H. Christensen, 2003: Importance of mesoscale processes in climate change projections. *IUGG meeting*.
- Takle, E. S., M. J. Falk, X. Zhou, and J. R. Brandle, 2003: Calibration and Applications of a Shelterbelt Turbulent Flow Model. *International Conference on Wind Effects on Trees*. Karlsruhe, Germany, September.
- Greenfield, T. M., E. S. Takle, B. J. Tentinger, J. J. Alamo, D. Burkheimer, and D. McCauley, 2003: Bridge Frost: Observations and forecasts by numerical methods. *Mid-Continent Transportation Research Symposium*. Center for Transportation Research and Education, Iowa State University, Ames, IA.
- Temeyer, B., W. A. Gallus, E. S. Takle, T. M. Greenfield, K. Jungbluth, D. Burkheimer, and D. McCauley, 2003: Using an artificial neural network to predict parameters for frost deposition on Iowa bridges. *Mid-Continent Transportation Research Symposium*. Ames, August.
- Pan, Z., R. W. Arritt, E. S. Takle, W. J. Gutowski, Jr., C. J. Anderson, and J. H. Christensen, 2003: Role of mesoscale processes in climate change over the central United States. – a warming “hole”. *10th Conference on Mesoscale Processes*. Amer. Meteor. Soc. Portland OR. 23-27 June 2003.
- Takle, E. S., 2003: Carbon dioxide, climate change, and carbon sequestration. Workshop on Carbon Sequestration, *Annual Meeting of Stockholders Basin Electric*. Bismarck ND. 1,000 attendees. Invited presentation.
- Takle, E. S., 2003: High-frequency pressure pumping of carbon dioxide from soils. *Workshop on Issues and Advances in Soil Respiration*. NIGEC/DOE, Boulder, CO.

- Takle, E. S. W. J. Gutowski, Jr., and R. W. Arritt, 2003: Project to Intercompare Regional Climate Simulations: Contributions to transferability. *Ninth Annual GEWEX Hydrometeorology Panel Meeting*, Lüneberg Germany.
- Takle, E. S., 2003: Impact of climate change on stream flow in the Upper Mississippi River Basin. *Ninth Annual GEWEX Hydrometeorology Panel Meeting*, Lüneberg Germany.
- Today, D. P., D. E. Herzmann, and E. S. Takle, 2002: The Iowa Environmental Mesonet – combining observing systems into a single network. *Sixth Symposium on Integrated Observing Systems*. Amer. Meteor. Soc. Orlando, FL
- Pan, Z., E. S. Takle, R. Horton, and M Segal, 2002: Warm-seasonal soil moisture prediction using a coupled regional climate model. *16th Conference on Hydrology*. American Meteorological Society, Orlando FL.
- Pan, Z., M. Jha, E.S. Takle, and R. Gu, 2002: Regional climate model based water quality assessment for climate change in the Upper Mississippi River Basin. *Second ICTP Conf. on Detection and Modeling of Regional Climate Change*. 30 September - 4 October, 2002. Trieste Italy.
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- Takle, E. S., E. K. Sorensen, and D. Herzmann, 2002: Evaluating current capabilities and future research issues in the use of online course portfolios. A workshop to be presented at the *Conference on Computer Support for Collaborative Learning 2002*. Boulder CO.
- Arritt, R. W., J. M. Riese, M. E. Westgate, E. S. Takle, and M. J. Falk, 2002: Application of a Lagrangian model for pollen dispersion. *15th Symposium on Boundary Layers and Turbulence*. Amer. Meteor. Soc. Wageningen, The Netherlands.
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- Pan, Z., S. E. Bryant, E. S. Takle, R. W. Arritt, C. J. Anderson, and W. J. Gutowski, Jr., 2001: Verification and future-scenario projections of snow depth and soil moisture in a regional climate model. Eighth Scientific Assembly, International Association of Meteorology and Atmospheric Sciences, 10-18 July, Innsbruck.
- Arritt, R. W., C. J. Anderson, W. J. Gutowski, Jr., E. S. Takle, Z. Pan, F. Otieno, M. de Castro, D. Caya, S.-C. Chen, J. H. Christensen, O. B. Christensen, M. Fox-Rabinovitz, M. A. Gaertner, F. Giorgi, G. Grell, S.-Y. Hong, C. Jones, H.-M. H. Juang, J. J. Katzfey, W. M. Lapenta, R. Laprise, J. W. Larson, G. Liston, D. Luethi, P. Marbaix, J. L. McGregor, R. A. Pielke, Sr., J. O. Roads, M. Rummukainen, and J. A. Taylor, 2001: A multi-model regional climate ensemble for the 1993 flood over the Central United States. Eighth Scientific

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- Miller, N. I., W.J. Gutowski Jr., Z. Pan, J. H. Christensen, R.K. Hartman, R.W. Arritt, E. S. Takle, and O. B. Christensen, 2001: Assessing California Streamflow under present day and a 2040 to 2049 climate change scenario. *12th Symposium on Global Change Studies*, Amer. Meteorol. Soc., Albuquerque, NM
- Takle, E. S., Z. Pan, R. W. Arritt, and W. J. Gutowski, Jr., 2001: Changes in snow depth and soil moisture from regional climate model simulations of future scenario climates. *12th Symposium on Global Change Studies*, Amer. Meteor. Soc., Albuquerque, NM.
- Kim, J., N. L. Miller, T.-K. Kim, R. W. Arritt, W. J. Gutowski, Jr., and E. S. Takle, 2001: Downscaled climate change scenario for the western U. S. using MAS-SPS Model nested within the HadCM2 scenario. *12th Symposium on Global Change Studies*, Amer. Meteor. Soc., Albuquerque, NM
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- Sorensen, E. K., and E. S. Takle, 2001: Impacts of putting requirements on dialog in CSCL. *European Conference on Computer Supported Collaborative Learning 2001*. Maastricht, Netherlands. 22-24 March
- Pan, Z., E.S. Takle, R. W. Arritt, and W. J. Gutowski, Jr., 2001: Changes in snow depth and soil moisture from regional model simulations of future scenario climates. *12th Symposium on Global Change Studies*, Amer. Meteorol. Soc., Albuquerque, NM
- Sorensen, E. K., and E. S. Takle, 2001: Collaborative knowledge building in Web-based learning. Assessing the quality of dialogue. *EDMEDIA-2001: World Conference on Educational Multimedia, Hypermedia & Telecommunications*. Tampere Finland. {Selected through peer review by the International Program Committee

- and final blind review by the Conference Program Chairs from over 1100 papers from 60 countries to receive the ED-MEDIA 2001 Best Paper Award.}
- Gutowski, W. J., Jr., R. W. Arritt, E. S. Takle, Z. Pan, F. Giorgi, J. H. Christensen, S. -Y. Hong, W. M. Lapenta, G. E. Liston, J. McGregor, and J. O. Roads, 2000: Project to Intercompare Regional Climate Simulations (PIRCS): Advancing the CLIVAR Agenda. *Exchanges: Newsletter of the Climate Variability and Predictability Programme (CLIVAR)*. 5 (4), 13-15.
- Gutowski, W. J., R. W. Arritt, E. S. Takle and Z. Pan, 2000: Project to Intercompare Regional Climate Simulations (PIRCS): Lessons and Suggestions for an Asian RMIP. *Regional Climate Model Inter-comparison for Asia: Inception Workshop*, Yonsei University, 26-29 June 2000, Seoul Korea. [\[invited\]](#)
- Pan, Z., J.H. Christensen, R.W. Arritt, W.J. Gutowski, E.S. Takle, and F. Otieno, 2000: Contrasting biases in regional climate simulations to climate changes. *International Conference & Young Scientist Workshop on Asian Monsoon Environmental System and Global Change*.
- Temeyer, Brad, William A. Gallus, Jr., Eugene S. Takle, Dennis Burkheimer, and Diane McCauley, 2001: A winter weather index to estimate maintenance costs in the Midwest. *17th International Conference on Interactive Information and Processing Systems (IIPS)*, Amer. Meteorol. Soc., Albuquerque, NM.
- Arritt, R. W., R. Wilby, L. E. Hay, W. J. Gutowski, Jr., C. J. Anderson, M. P. Clark, G. H. Leavesley, Z. Pan, R. Silva, and E. S. Takle, 2000: Comparison of statistical and dynamical downscaling for evaluating climate change impacts on water resources. *International Workshop on Climatic Change: Implications for the Hydrological Cycle and for Water Management*. Wengen Switzerland.
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- Pan, Z., J. H. Christensen, R. W. Arritt, W. J. Gutowski, Jr., and E. S. Takle, 2000: Ten-year US regional climate simulations for impacts assessments. *11th Symposium on Global Change Studies*. Amer Meteor. Soc., Long Beach, CA 9-14 January.
- Takle, E. S., J. R. Brandle, R. A. Schmidt, R. Garcia, I. V. Litvina, G. Doyle, X. Zhou, Q. Hou, C. W. Rice, and W. J. Massman, 2000: Pressure pumping of carbon dioxide from soil. *24th Conference on Agricultural and Forest Meteorology*, Amer. Meteorol. Soc., Davis, CA.
- Takle, E. S., 1999: Future climate change and agriculture. *Proceedings, 21st Annual Seed Technology Conference*, Ames, IA.
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- Lapenta, R. Laprise, P. Lopez, J. McGregor and J.O. Roads, 1999: Project to Intercompare Regional Climate Simulations. WMO Working Group on Numerical Experimentation report series "**Research Activities in Atmospheric and Oceanic Modeling.**"
- Arritt, R.W., W.J. Gutowski, Jr., E.S. Takle, Z. Pan, C.J. Anderson, R. Silva, D. Caya, S.-C. Chen, J.H. Christensen, F. Giorgi, S.-Y. Hong, H.-M. H. Juang, J.J. Katzfey, W.M. Lapenta, R. Laprise, P. Lopez, J. McGregor, R. A. Pielke, Sr., and J.O. Roads, 1999: Project to Intercompare Regional Climate Simulations (PIRCS): Preliminary analyses of precipitation processes. 14th Conference on Hydrology, American Meteorological Society, Dallas, Texas, 10-15 January 1999.
- Arritt, R.W., W.J. Gutowski, Jr., E.S. Takle, Z. Pan, C.J. Anderson, R. Silva, D. Caya, S.-C. Chen, J.H. Christensen, S.-Y. Hong, H.-M. H. Juang, J.J. Katzfey, W.M. Lapenta, R. Laprise, P. Lopez, J. McGregor and J.O. Roads, 1999: Project to Intercompare Regional Climate Simulations (PIRCS): Preliminary results for the 1988 Midwest drought. **10th Symposium on Global Change Studies**, American Meteorological Society, Dallas, Texas, 10-15 January 1999.
- Takle, E. S., M. R. Taber, and D. Fils, 1999: An interdisciplinary internet course on Global Change for present and future decision-makers. Invited Keynote Presentation. International Symposium on the Learning Society and the Water Environment. Paris, 2-4 June 1999.
- Gutowski, W. J. Jr., R. Wilby, E. S. Takle, R.W. Arritt, Z. Pan, C.J. Anderson, R. Silva, D. Caya, S.-C. Chen, J.H. Christensen, S.-Y. Hong, H.-M. H. Juang, J.J. Katzfey, W.M. Lapenta, R. Laprise, P. Lopez, J. McGregor and J.O. Roads, 1999: A comparison of downscaling for hydrologic analysis by statistical downscaling and limited-area modeling. **AGU Spring Meeting.**
- Takle, E. S., 1999: How does agriculture cause climate change? **National Forum for Agriculture: Climate Change and the Implications for Agriculture and Energy**, Ames, IA
- Takle, E. S., 1999: What is global warming and how do we know it's happening? **Climate Change: What Does It Mean for the Midwest?** Regional EPA Conference. Kansas City. April 1999.
- Pan, Z, J.H. Christensen, R.W.Arritt, W. J. Gutowski, Jr., E. S. Takle, and C.J. Anderson, 1999: Assessment of Regional Climate Change Simulation for Impacts Analysis. **Conference on Detection and Modeling of Regional Climate Change.** Trieste Italy 9 - 12 June 1999.
- Gutowski, W. J., Jr., R. L. Wilby, E. S. Takle, R.W. Arritt, Z. Pan, C.J. Anderson, R. Silva, D. Caya, S.-C. Chen, J.H. Christensen, S.-Y. Hong, H.-M. H. Juang, J.J. Katzfey, W.M. Lapenta, R. Laprise, G. Liston, P. Lopez, J. McGregor, R. Pielke, Sr., and J.O. Roads, 1999: A Comparison of Statistical and Dynamical Downscaling for Hydrologic Impact Analysis. . **Conference on Detection and Modeling of Regional Climate Change.** Trieste Italy 9 - 12 June 1999.
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- Detection and Modeling of Regional Climate Change.** Trieste Italy 9 - 12 June 1999.
- Takle, E. S., 1999: Climate Extremes and Crop Physiology. **Aspen Global Change Institute: Ecological and Agricultural Consequences of Climatic Extremes.** 13-22 August, Aspen Colorado. (Invited presentation)
- Sorensen, E. K., and E. S. Takle, 1999: Distributed collaborative learning across disciplines and national borders. **Conference on Computer Supported Collaborative Learning (CSCL'99)**, 575-581, Stanford University, Dec 12-15.
- Takle, E. S., 1999: "State of the art" of flexible learning (on/off campus). Invited presentation at Aalborg University, Denmark.
- Takle, E. S., 1999: A presentation (and demonstration) of Global Change - a course on environmental issues and global change. Invited presentation at Aalborg University, Denmark.
- Takle, E. S., 1999: The role of science and technology. Presentation in Iowa House Chambers, State Capitol in program on Taking on the Challenge of Climate Change: A Public Hearing Seeking Innovative Solutions. 6 November 1999.
- Brandle, J. R., X. H. Zhou, and E. S. Takle, 1999: The influence of three dimensional internal structure of a tree shelterbelt on aerodynamic effectiveness. Sixth Conference on Agroforestry in North America. Hot Springs AK.
- Zhou, X. H., J. R. Brandle, and E. S. Takle, 1999: Estimating the three dimensional internal structure of a green ash shelterbelt: distribution of surface area. Sixth Conference on Agroforestry in North America. Hot Springs AK.
- Takle, E. S., H. Wang, J. R. Brandle, X. Zhou, and I. V. Litvina, 1999: Numerical simulations and measurements of effects of wind direction and shelter structure on shelterbelt efficiency. Sixth Conference on Agroforestry in North America. Hot Springs AK.
- Mize, C., W. Batchelor, J. Brandle, R. Cruse, M. Ghaffarzadeh, X. Qi, E. Takle, and P. Wray, 1999: SAMS (Shelterbelt Agroforestry Modeling System): Present status and future directions. In: *Exploring the Opportunities for Agroforestry in Changing Rural Landscapes*, L. Buck and J. Lassoie, Ed., Proc. Fifth Conf. on Agroforestry in North America. Ithaca, NY Aug., 1997, p 135-137.
- Litvina, I., A. Litvin, and E. S. Takle, 1999: On the features of turbulent transfer of heat and mass in air density stratified flow of the atmospheric surface layer. *Third Baltic Heat Transfer Conference* 22-24 September, Gdansk, Poland.
- Takle, E. S., 1998: University Instruction in Observational Techniques: Survey Responses. **Preprints, 7th Symposium on Education.** Amer. Meteor. Soc., Phoenix.
- Takle, Eugene S., and David T. Kao, 1998: A Synthesis of Models for Describing Multi-scale Interactions within Natural Systems. In A. Sydow and J.-Y. Yu, **1998 Conference on Mission Earth: Modeling and Simulation of the Earth System.** Society for Computer Simulation International, San Diego, CA. 29-34.
- Pan, Zaitao, Eugene S. Takle, William Gutowski, and Richard Turner, 1998: Long simulation of regional climate as a sequence of short segments. **9th Symposium on Global Change Studies.** Amer. Meteor. Soc., Phoenix.

- Pan, Zaitao, Eugene S. Takle, and Moti Segal, 1998: On relative efficiency of horizontal moisture flux and evapotranspiration in enhancing summer rainfall. **2nd Symposium on Integrated Observing Systems**. Amer. Meteor. Soc., Phoenix.
- Hesselbjerg Christensen, J., P. Lopez, R. W. Arritt, W. J. Gutowski, and E. S. Takle, 1998: On the role of a consistent treatment of physical parameterization in dynamical down scaling simulations. **Rossby Symposium**.
- Arritt, R. W., E. S. Takle, W. J. Gutowski, Jr., Z. Pan, and J. Hesselbjerg Christensen, 1998: Regional climate change for impacts analysis: Evaluating ensemble projections. **Second International Climate and History Conference**. Norwich England.
- Arritt, R. W., Takle, E. S., Gutowski, W. J., Jr., and Z. Pan, 1998: Effects of Low Frequency Atmospheric Variability on Regional Drought and Flood. Poster H52B-04. AGU Spring Meeting, Boston.
- Takle, E. S., M. R. Taber, and D. Fils, 1998: Global Change Course on the Internet. AGU Spring Meeting.
- Gutowski, W. J., Jr., E. S. Takle, and R. W. Arritt, 1998: Project to Intercompare Regional Climate Simulations, Workshop II, 5-6 June 1997. Bull. Amer. Meteorol. 79, 657-659.
- Shen, J., W. D. Batchelor, E. S. Takle, R. Kanwar, and C. Mize, 1998: Prediction of spatial soil water balance in a soybean field. 1998 ASAE Annual International Meeting, Orlando. 24 pp.
- Takle, E. S., Z. Pan, R. W. Arritt, and W. J. Gutowski, Jr., 1998: Regional climate scenarios for water resources research and impact assessment. Second International Conference on Climate and Water. Vol. 1, 1-9. Espoo, Finland 17-20 August.
- Takle, E. S., M. R. Taber, and D. Fils, 1998: Interactive courseware on global change issues for universities and policymakers. Second International Conference on Climate and Water. Vol. 3, 1664-1669. Espoo, Finland 17-20 August.
- Knollhoff, D. S., E. S. Takle, W. A. Gallus, Jr., and D. Burkheimer, 1998: Use of pavement temperature measurements for winter maintenance decisions. Crossroads 2000 Proceedings. Iowa State University. 33-36.
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- Takle, E. S., 2015-2016: Short Course Development: Climate Change Adaptation in Agriculture. Supplement. **USDA** \$39,843. 09/30/2015 – 09/29/2017
- McCalley, J. D., L. Brasche, J. Jackman, L. Rodriguez, and E. S. Takle, 2011-2016: Wind Energy Science, Engineering, and Policy (WESEP) – IGERT. **National Science Foundation**. \$3,152,063
- Somani, A., S. Aluru, R. Fox, M. S. Gordon and E. S. Takle, 2012-2016: MRI: Acquisition of a HPC System for Data-Driven Discovery in Science and Engineering. **National Science Foundation**. **MRI**\$1,841,346.
- Brown, R.C. and multiple co-PIs, 2011-2016: Harnessing energy flows in the biosphere. **National Science Foundation EPSCoR grant #EPS-1101284**. \$20M (Takle is responsible for about \$800,000 in equipment purchases and about \$100,000 per year for five years in operating budget)
- Takle, E. S., 2013-2014: Supplementary frost forecasts for Iowa roads and bridges. **Iowa Department of Transportation**. \$25,000
- Takle, E. S., and C. J. Anderson, 2013-2014: Support of Federal Highways Climate Change Vulnerability Assessment Pilot. **Federal Highway Administration**. \$208,676.
- Takle, E. S., and W. A. Gallus, 2013-2014: Meteorological support for offshore wind resource characterization in the Gulf of Mexico. **Baryonyx Corporation**. \$87,447
- Frank, M. C., S. Sritharan, E. S. Takle, F. E. Peters, M. R. Kessler, 2012-2013: Planning Grant: I/UCRC for Wind Energy, Science, Technology, and Research (WindSTAR). **National Science Foundation**. \$11,500.
- Takle, E. S., 2012-2016: Short Course Development: Climate Change Adaptation in Agriculture. **USDA** \$125,000
- Takle, E. S., 2012-15: Building Accurate Historic and Future Climate MEPDG Input Files for Louisiana DOT. **National Center for Asphalt Technology**. \$48,728
- Takle, E. S., 2012-2014: Development of a balloon-borne buoy-mounted measurement platform. **IAWIND (Iowa Power Fund)**. \$300,000
- Takle, E. S., and S. Rabideau, 2011-2012: Development of an alternative to the Typical Meteorological Year. **Center for Global and Regional Environmental Research, University of Iowa**. \$30,000.
- Brasche, L., J. McCalley, F. Peters, G. Rajagopalan, S. Sritharan, and E. S. Takle, 2011-2013: Venture Fund: Institute for Wind Energy Science, Engineering, and Policy. **ISU College of Engineering**. \$500,000

- Takle, E. S., and J. D. McCalley, 2011-2014: Wind energy science, engineering and policy – REU-Site. **National Science Foundation**. \$399,239
- Gutowski, W. J., Jr., E. S. Takle, and R. W. Arritt, 2010: Collaborative Research: The North American Regional Climate Change Assessment Program (NARCCAP)--Using Multiple GCMs and RCMs to Simulate Future Climates and Their Uncertainty. **National Science Foundation**. \$65,833.
- Ogilvie, C., C. Cervato, T. J. Greenbowe, J. A. Powell-Coffman, and E. S. Takle, 2010: Undergraduate Science Education 2010. **Howard Hughes Medical Institute**. \$1,600,000
- Takle, E. S., 2010-2011: Analysis and interpretation of precipitation characteristics relating to Iowa floods. **Iowa Flood Center**. \$100,000.
- Prokopy, L S, 21 other investigators including E. S. Takle, 2010-2015: Useful to Usable (U2U): Transforming Climate Variability and Change Information for Cereal Crop Producers. **USDA/AFRI**. \$5,000,000.
- Segal, M., E. S. Takle, and D. R. Rajewski, 2009-2010: Sustainability of crop yields and wind power in Iowa under expansion of wind farms. **Center for Global and Regional Environmental Research, University of Iowa**. \$27,000.
- Gallus, W. A., Jr., E. S. Takle, M. Segal, P. Caragea, and J. McCalley, 2009-2012: Wind Forecast Model Validation and Improvement for the Central US. **US Department of Energy**, \$250,000
- Gallus, W. A. Jr., and E. S. Takle, 2009-2011: Design of a meteorological model ensemble forecasting system for improved wind energy forecasting. **Mid-American Energy Corp**. \$49,236
- Takle, E. S., 2009: Past and future scenario climate for the state of Mississippi. **National Center for Asphalt Technology**. \$24,157
- Arritt, R. W., W. J. Gutowski, Jr., E. S. Takle, 2008-2011: Multi-RCM ensemble downscaling of NCEP CFS seasonal forecasts (MRED). **National Oceanic and Atmospheric Administration**, \$291,114.
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- Takle, E. S., 2006-2011: Development and evaluation of downscaling tools for near-surface flow (Collab Res. with S. C. Pryor, Indiana Univ.). **National Science Foundation** \$60,145 (ISU portion).
- Takle, E. S., Z. Pan, and M. Segal, 2006-09: Evaluating effects of climate changes on Midwest agroecosystems using a climate-crop coupled model. **National Institute for Climate Change Research (DOE)**. \$374,984
- Williams, R. C., and E. S. Takle, 2006-2007: Assessment of Iowa climatic data and its integration into the AASHTO mechanistic-empirical pavement design procedure. **Iowa Department of Transportation**. \$50,000.

- Sarkar, P. P., W. A. Gallus, Jr., E. S. Takle, F. L. Haan, Jr., H. Hu, and V. Dayal, 2006-2007: Reducing wind-induced damages from storms. **National Oceanic and Atmospheric Administration**, \$923,241.
- Gleason, M. L., S. E. Taylor, M. D. Duffy, P.A. Domoto, D. Lewis, G. Nonnecke, E. S. Takle, and D. Mueller, 2005-2008: National effort to implement IPM decision support tools using site-specific weather technology. **USDA National Research Initiative**. \$931,146.
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- Colletti, J., J. Tyndall, J. Thompson, R. Arritt, S. Hoff, and E. Takle, 2004: Vegetative environmental buffers to mitigate odor and aerosol pollutants emitted from poultry production sites. **USDA National Research Initiative**, \$440,205.
- Takle, E. S., 2004: Test and validation of a model for forecasting frost on bridges. **Minnesota Department of Transportation**. \$34,205.
- Takle, E. S., R. W. Arritt, and W. J. Gutowski, Jr., 2004-2006: Regional climate modeling coordination for the United States. **National Science Foundation**, \$137,127.
- Takle, E. S., 2003-04: Forecasts and observations of frost on bridges. **Minnesota Department of Transportation. (AURORA)**. \$50,000.
- Asbjornsen, H., J. Colletti, C. Flora, T. Isenhardt, F. Kirshenmann, J. Pease, J. Pesek, R. Salvador, R. Schultz, and E. S. Takle, 2003: Water quality as an indicator of landscape change. **US Forest Service**, \$61,200.
- Takle, E. S., 2003: Online electronic portfolio for teaching global change. **NASA Earth System Science Education**. Subcontract from University of Northern Colorado. \$2,800
- Takle, E. S., 2002: Bridge frost observations. **Iowa Department of Transportation**. \$5,000.
- Arritt, R. W., E. S. Takle, and W. J. Gutowski, Jr., 2002: Hardware and software for a Live Access Server for online distribution of climate model data. **Electric Power Research Institute**. \$19,953.
- Takle, E. S., Z. Pan, and B. Batchelor, 2001-05: Test and evaluation of coupled climate-ecosystem models. **National Institute of Global Environmental Change (DOE)**. \$253,604.
- Arritt, R. W., W. J. Gutowski, Jr., and E. S. Takle, 2001-04: Multi-model ensemble simulations of the North American Monsoon System. **NOAA Office of Global Programs**. \$180,000.
- Takle, E. S., 2001: Distance delivery of the Iowa State University Global Change course. **USDA**. \$50,000.
- Takle, E. S., 2001-02: Distance delivery of the Iowa State University Global Change course. **WOI-Endowment Funds**. \$24,000.
- Takle, E. S., and Z. Pan, 2001-03: Basin scale water quality change and uncertainty under global climate change. **Center for Global and Regional Environmental Research**. \$19,900.

- Takle, E. S., and W. A. Gallus, 2001-2002: Roadway frost prediction systems and winter weather index. **Iowa Department of Transportation**. \$40,776.
- Gutowski, W.J. Jr., R. W. Arritt, E. S. Takle, 2001-2003: Collaborative Research: One- and two-way coupling of atmospheric and hydrologic models. **NOAA Office of Global Programs**. \$146,000.
- Mize, C. W., W. D. Batchelor, E. S. Takle, and J.A. Hallam, 2000: Modeling corn and soybean production in a sheltered field. **USDA NRI** \$523,745.
- Gutowski, W. J. Jr., R. W. Arritt, E. S. Takle, 2000: Regional climate modeling. **Electric Power Research Institute**. \$35,742
- Takle, E. S., and D. P. Todey, 2001: Establishment of an Iowa Environmental Mesonet. **USDA World Agricultural Outlook Board**. \$29,272
- Takle, E. S., 2001: Distance delivery of the Iowa State University Global Change course. **USDA**. \$50,000.
- Takle, 1999: Earth system modeling with the ISU High Performance Computer. **ISU High Performance Computing (HPC) Partnership**, \$7,500.
- Takle, E. S., 1999: Support of the NOAA Proposal for a Project for Midwest Climate Impacts Assessment. Office of Vice Provost. \$14,700.
- Gutowski, W. J. Jr., R. W. Arritt, and E. S. Takle, 1999: Regional climate model simulations of future climates in California. **Electric Power Research Institute**. \$62,000
- Takle, E. S., 1999-2001: Pilot study of influences of atmospheric pressure fluctuations on fluxes of trace gases from soils. **Great Plains Regional Center, National Institute for Global Environmental Change (NIGEC/USDOE)** \$31,517.
- Takle, E. S., and W. J. Gutowski, Jr., 1999: Global change, climatology, and land-use in Iowa. **Center for Global and Regional Environmental Research**. \$20,000.
- Gutowski, W. J., Jr., E. S. Takle, and R. W. Arritt, 1998-99: Limited area climate modeling for comparison with downscaling. **Electric Power Research Institute**. \$75,000.
- Takle, E. S., 1998: Global Change in IAI countries. **National Science Foundation**. \$15,945 (with supplemental funding from IAI/GEF, see above)
- Takle, E. S., 1998: A vernacular Internet course in Global Change for senior undergraduate and graduate students. **Inter-American Institute for Global Change Research, Global Environment Facility**. \$40,755 (with supplemental funding from NSF, see below)
- Gallus, W. A. ,Jr., and E. S. Takle, 1998-99: Maximizing the use of roadway weather information systems. Phase 2: Procedures for effective use by state, cities, and counties. Iowa Department of Transportation. 48,563.
- Gutowski, W. J., Jr., E. S. Takle, and R. W. Arritt, 1998-01: Investigation of seasonal predictability of precipitation for the central United States. **National Oceanic and Atmospheric Administration (GOALS)**. \$150,000.
- Takle, E. S., 1997: A vernacular Internet course in Global Change for senior undergraduate and graduate students: Funding for students to translate web materials to Spanish. **Office of International Students and Scholars, ISU**. \$4,800.

- Young, Bing Lin, David T. Kao, Joel Snow, Robert Horton, Robert C. Brown, E. S. Takle, and James Vary, 1997: Sustainable Development Project for Henan Province, China. PROMAG Funds, **Office of the Vice Provost**. \$43,220.
- Austin, T. A., E. S. Takle, D. Shinn, T.-C. Chen, 1997: Proposed Midwest Center for the Study of Weather Related Disasters. PROMAG Funds, **Office of the Vice Provost**. \$35,800.
- Takle, E. S., and W. J. Gutowski, Jr., 1996: Global change, climatology, and land-use in Iowa. **Center for Global and Regional Environmental Research**. \$25,000.
- Takle, E. S., and S. El-Khabiry, 1997: Production of calculus courses in Arabic language on the Internet and compact disks. **UNESCO**. \$50,000
- Gutowski, W. J., Jr., E. S. Takle, and R. W. Arritt, 1996-1999: Regional climate simulations for impact assessment under the Project to Intercompare Regional Climate Simulations (PIRCS). **Electric Power Research Institute**. \$589,742.
- Takle, E. S., W. G. Gutowski, Jr., and R. W. Arritt, 1996-97: Mesoscale-Model/Impact-Assessment Workshop. **Electric Power Research Institute**. \$57,600.
- Takle, E. S., and W. Gallus, 1997: Maximizing the use of roadway weather information systems. **Iowa Department of Transportation**. \$89,291
- Mize, C. W., W. D. Batchelor, J. A. Hallam, P. H. Wray, E. S. Takle, J. R. Brandle, R. Cruse, and M. Ghaffarzadeh, 1996-99: Modeling a shelterbelt agroforestry system. **USDA National Research Initiative Competitive Grants Program**. \$330,000.
- Kothari, S., E. S. Takle, and J. Gustafson, 1996-99: Parallelization agent for legacy codes in environmental modeling. **EPA - High Performance Computing**. \$484,382.
- Takle, E. S., R. C. Seagrave, and M. R. Taber, 1996: A global change course on the Internet for graduating seniors. **Internationalization/Globalization Initiative, Office of the Provost, ISU**. \$20,000.
- Takle, E. S., R. C. Seagrave, and M. R. Taber, 1996: A global change course on the Internet for graduating seniors. **Internationalization/Globalization Initiative, Office of the Provost, ISU**. \$20,000.
- Takle, E. S., and W. J. Gutowski, 1994: Regional scale climate model intercomparison workshop. **Center for Global and Regional Environmental Research, U. of IA**. \$5,000.
- Takle, E. S. and I. V. Litvina, 1994: Turbulence Fields and Density Fluctuations in Inhomogeneous Micrometeorological Flows, **NIS/Baltics Research Committee**. \$2580.
- Takle, E. S., and W. J. Gutowski, 1994: Regional scale climate model intercomparison workshop. **International Institute of Theoretical and Applied Physics**. \$10,000.
- Brandle, J. R., W. E. Easterling, E. S. Takle, M. M. Schoenberger, and R. A. Schmidt, 1993-95: Assessment of climate change on a mixed agricultural landscape on the North American Great Plains. **US Department of Energy, NIGEC**. \$362,100 (\$63,600 for EST).
- Takle, E. S., R. A. Schmidt, and J. R. Brandle, 1993-97: Microclimate impacts of shelterbelts in agroforestry ecosystems. **US Department of Agriculture - CSRS**. \$295,016.

- Rajagopalan, R. G., E. S. Takle, and R. M. Nelson, 1993-96: Iowa wind resource assessment. **Iowa Energy Center**. \$180,000.
- Takle, E. S., 1993-96: Development and implementation of an expert system for forecasting fog on US Highway 30 in Cedar Rapids. **Federal Highway Research Board**. \$145,245.
- Takle, E. S., 1993-94: Relation of forest-fire severity to long-term precipitation anomalies. **USDA Forest Service**. \$46,000.
- Takle, E. S., 1993: Intercomparison of global climate model simulations for the US Midwest for a doubling of atmospheric CO₂. **Center for Global and Regional Environmental Research**. \$15,000.
- Takle, E. S., and J. Gustafson, 1993-96: A massively parallel global mesoscale model with improved surface-layer coupling. **NASA - High Performance Computing and Communications Program**. \$90,000.
- Takle, E. S., 1993: Project Development Visit (Shelterbelt turbulence). **National Academy of Science**. \$1,800.
- Takle, E. S., and L. O. Mearns, 1992: Evaluation of temperature means, extremes, and variability for the US Midwest for a doubling of atmospheric CO₂. **Center for Global and Regional Environmental Research**. \$15,000.
- Takle, E. S., 1992: Iowa climate data for a doubling of atmospheric CO₂. **USDA Soil Conservation Commission**. \$1,000
- Takle, E. S., 1991: USA-USSR collaboration on shelterbelt design. **ISU/USSR VASKNhl Agreement**. \$1,400 (travel funds for collaboration with Soviets)
- Takle, E. S., T.-C. Chen, and J. Gustafson, 1990-92: Coupled global and regions climate modeling by use of massively parallel computers. **US Department of Energy**. \$777,000.
- Takle, E. S., 1990: Impacts of global climate change on the Dakotas. **South Dakota State University**. \$2,600
- Takle, E. S., 1987-90: Development of an expert system for forecasting frost on bridges and roadways in Iowa. **Federal Highway Research Board**. \$108,000.
- Takle, E. S., 1987-88: Modeling boundary-layer flows. **National Center for Atmospheric Research**. \$21,000 (computer resources)
- Takle, E. S., 1986-88: Finite-element boundary-layer modeling. **National Center for Atmospheric Research**. \$3,375 (computer resources)
- Takle, E. S., 1986-87: Application of meteorological models to agriculture. **Agriculture Experiment Station - Agronomy Department**. \$3,500
- Schacher, G. E., E. S. Takle, and S. E. Larsen, 1985-90: Analysis of the Space Shuttle Exhaust Hazard. **US Air Force (Space Division)**. \$868,000 (\$238,000 earmarked for EST)
- Takle, E. S., 1985-86: Modeling diffusion over a plant canopy. **Agriculture Experiment Station - Agronomy Department**. \$2,000
- Takle, E. S., and J. Glendening, 1985-86: Finite-element modeling. **National Center for Atmospheric Research**. \$9,000 (computer resources)
- Takle, E. S., and J. Glendening, 1985-86: Finite-element modeling. **National Center for Atmospheric Research**. \$9,000 (computer resources)
- Takle, E. S., 1984-85: Finite-element modeling. **National Center for Atmospheric Research**. \$11,195 (computer resources)

- Takle, E. S., 1984-85: Modeling diffusion over a plant canopy. **Agriculture Experiment Station - Agronomy Department**. \$2,000
- Takle, E. S., 1983-85: Finite-element boundary-layer modeling. **National Science Foundation**. \$95,142.
- Takle, E. S., 1983-85: Finite-element boundary-layer modeling. **National Science Foundation**. \$53,800.
- Takle, E. S., 1983-84: Finite-element modeling. **National Center for Atmospheric Research**. \$17,912 (computer resources)
- Takle, E. S., Modeling diffusion over a plant canopy. **Agriculture Experiment Station - Agronomy Department**. \$2,000
- Takle, E. S., 1982-83: Finite-element modeling. **National Center for Atmospheric Research**. \$13,434 (computer resources)
- Takle, E. S., 1982-83: Modeling diffusion over a plant canopy. **Agriculture Experiment Station - Agronomy Department**. \$2,000
- Takle, E. S., 1982-83: Modeling diffusion over a plant canopy. **Agriculture Experiment Station - Agronomy Department**. \$2,000
- Takle, E. S., 1982: Finite-element model of the atmospheric transport of fugitive dust from mining activity. **Energy and Mineral Resources Research Institute**. \$7,000 (research assistantship and computer time)
- Takle, E. S., 1982: Development of tailored meteorological forecasts for the Energy Research House. **Engineering Research Institute (ISU)**. \$15,235
- Takle, E. S., 1981-82: Development, testing and application of a finite-element atmospheric boundary-layer model. **National Center for Atmospheric Research**. \$6,372
- Takle, E. S., 1981-82: Numerical modeling of diffusion over a plant canopy. **Agriculture Experiment Station - Agronomy Dept**. \$1,800
- Takle, E. S., 1981-82: Finite-element model of the atmospheric transport of fugitive dust from mining activity. **Energy and Mineral Resources Research Institute**. \$6,900 (research assistantship and computer time)
- Takle, E. S., and R. L. Sani: Development, testing and application of a finite-element atmospheric boundary-layer model. **National Center for Atmospheric Research**. \$25,000 (computer resources)
- Takle, E. S., 1981-82: Development, testing and application of a finite-element atmospheric boundary-layer model. **National Science Foundation**. \$66,748.
- Takle, E. S., 1980-81: Finite-element model of the atmospheric transport of fugitive dust from mining activity. **Energy and Mineral Resources Research Institute**. \$6,000 (research assistantship and computer time)
- Takle, E. S., and R. L. Sani, 1980-81: Development, testing and application of a finite-element atmospheric boundary-layer model. **National Center for Atmospheric Research**. \$24,000 (computer resources)
- Takle, E. S., 1980-81: Development, testing and application of a finite-element atmospheric boundary-layer model. **National Science Foundation**. \$65,500.
- Takle, E. S., and R. L. Sani, 1979-81: Finite-element boundary-layer model. **National Center for Atmospheric Research**. \$8,000 (computer resources)
- Takle, E. S., 1977-78: Analysis of the fugitive dust problems associated with the surface mining of Iowa coal. **Iowa Coal Project**. \$10,000.

Courses Taught

Introduction to meteorology for majors (U)

Atmospheric thermodynamics (U)

Synoptic meteorology (U)

Dynamic meteorology (G)

Mathematical methods in climatology (G)

Air pollution (U, G)

Boundary-layer meteorology (G)

Global change (U, G)

Wind energy resources (G) (Wind Energy Science, Engineering and Policy Program)