

# Daryl E. Herzmann

## Curriculum Vitae

### Contact Information

Department of Agronomy  
Iowa State University  
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### Education

- B.A., 2001, Iowa State University. Meteorology Major.

### Employment

Iowa State University, October 1997 - present

- August 2001 - present: Systems Analyst III, Iowa State University.  
**Supervisors:** Dr Dennis Todey (2001-2004), Dr Raymond Arritt (2004-2018) and Dr Rick Cruse (2018-).  
**Iowa Environmental Mesonet:** Develop an environmental data collection platform to support the research and outreach activities of the University. Determine and execute new approaches to data collection and dissemination through a feature rich website. Manage the day to day support demands created by the large number of core partners and general public.  
**Department of Agronomy:** Collaborate on multi-disciplinary research times providing computational and meteorological expertise to the groups.  
**Grant-Supported Research** Manage High Performance Computing platforms to support the research activities of Ag-Meteorology group. Design, implement, and administer computing and storage platforms.
- March 1998 - May 2001: International Institute for Theoretical & Applied Physics (IITAP). Supervisor: Doug Fils. Duties included multi-platform systems administration, computer programming and computer instruction.
- October 1997 - May 2001: Partnerships to Advance Learning in Science (PALS). Supervisor: Dr Doug Yarger. Duties included website administration, database programming and data manipulation.

### Computational Skills

- IT Cerifications: Red Hat Certified Engineer (RHCE for Red Hat 6).
- Software Graphing packages: NCL, GrADS, Matplotlib.
- Data Markup and Computer Scripting Languages: HTML5, XML, JSON, shell scripting.
- Biophysical Software Models: AERMOD (EPA Regulatory Model), WEPP (Soil Erosion Model).
- Meteorological Software Models: MM5 (Weather/Climate Simulator), WRF (Weather/Climate Simulator).

- Programming Languages: Java, PHP, Python, SQL.

## Awards

- 2016 Russell L. DeSouza Award, UCAR. (2016)
- Operational Achievement Award, National Weather Association. (2012)
- Environmental Hero Award, National Oceanic and Atmospheric Administration. (2007)
- Larry R Johnson Award, National Weather Association. (2002)

## Current Research Projects (PIs, Team Size)

- Iowa Environmental Mesonet (2, 2)  
2001-2020. Integrating diverse datasets from eight different observing networks in the state of Iowa. Program and maintain data ingestion / manipulation systems to process the data. Exploring and implementing new techniques for data visualization and dissemination. Coordinate with local agencies with oversight of their observing networks. Data focalpoint for observations in the state of Iowa. Project website generates billions of hits from millions of unique internet addresses (users) per month. Email and phone support is given for hundreds of agencies that contact the project each year.
- Daily Erosion Project (2, 8)  
2014-2020. Developing a model system to analyze real-time soil erosion loss over the midwestern US. Responsibilities include the development of the model execution environment, generation of analysis products, and dissemination of products via website.

## Past Research Projects (PIs, Team Size)

- Iowa Department of Transportation (1, 2)  
Created a software system to generate near-realtime forecasts of pavement temperatures and conditions to support winter activities of the DOT. Created two new interfaces between weather forecast data and domain-specific forecast models.
- Wind-Energy Research with Industry Partner (1, 6)  
Curated a very large and confidential dataset from a wind farm in Iowa. Wrote analysis routines and a web interface to allow collaborators to query and visualize the dataset.
- Mississippi Department of Transportation (3, 6)  
Generated domain-specific pavement performance model weather input files to facilitate evaluation of current and future climates impact on Mississippi Roads.
- Multi-RCM Ensemble Downscaling (1, 3)  
Assisted with the proctoring of climate models on High Performance Computing. Supported the researchers involved in analysis and diagnosis of output.
- North American Regional Climate Change Assessment Program (6, 100+)  
Proctored the simulation of climate models on High Performance Computing. Analyzed the output and prepared model output summary files as per community standards. Assisted in the development and debugging of model codes for this effort.
- Pacific Climate Change Science Program (3, 6)  
Proctored the simulation of climate models on High Performance Computing. Designed and constructed a computing cluster to support this effort.

- Sustainable Corn and Cropping Systems (38, 170)  
2011-2017. [20 million dollar grant by USDA-NIFA] Construction and management of multi-disciplinary database supporting collection, analysis, and modelling efforts of project. Evaluate, determine, and implement virtual collaboration platforms to support project collaboration. Provide meteorological and climate modeling expertise to support synthesis.

## ISU Internal Committee Memberships

- High Performance Computing - Storage Subcommittee
- Red Hat Enterprise Linux Management Team

## Membership in Professional Societies

- American Meteorological Society - Severe Local Storms Committee (2013-2015)
- National Weather Association

## Websites Created and Currently Maintained

- Daily Erosion Project (v2). <https://dailyerosion.org>
- Iowa State Data Team. <https://datateam.agron.iastate.edu>
- Iowa Environmental Mesonet. <https://mesonet.agron.iastate.edu>
- Sustainable Corn. <https://sustainablecorn.org>

## Administrative Support for Websites

- ISU Atmospheric Sciences Homepage. <https://meteor.geol.iastate.edu>
- Meteorology Archive Server. <https://mtarchive.geol.iastate.edu>
- Meteorology Current Data Server. <https://metfs1.agron.iastate.edu>

## Publications

### Papers

- Wang, E., R. Cruse, B. Sharma-Acharya, **D. Herzmann**, B. Gelder, D. James, D. Flanagan, H. Blanco-Canqui, R. Mitchell, D. Laird. Strategic switchgrass (*Panicum virgatum*) production within row cropping systems: Regionalscale assessment of soil erosion loss and water runoff impacts. *GCB Bioenergy*, 2020; 955-967. <https://doi.org/10.1111/gcbb.12749>
- Archontoulis, S. et al. Predicting crop yields and soilplant nitrogen dynamics in the US Corn Belt. *Crop Science*, 2020; 721-738. <https://doi.org/10.1002/csc2.20039>
- Cruse, R., **D. Herzmann**, B. Sharma-Acharya, H. Blanco-Canqui, and B. Gelder. The Daily Erosion Project: Soil erosion impacts of strategic switchgrass (*Panicum virgatum*) placement in row cropped watersheds. *Geophysical Research Abstracts*, 2019; 21. 2019EGUGA..2118868C
- Gelder, B., T. Sklenar, D. James, **D. Herzmann**, R. Cruse, K. Gesch, and J. Laflen. The Daily Erosion Projectdaily estimates of water runoff, soil detachment, and erosion. *Earth Surface Processes and Landforms*, 2018; 1105-1117. <https://doi.org/10.1002/esp.4286>

- Iqbal, Javed, M. Necpalova, S. Archontoulis, R. Anex, M. Bourguignon, **D. Herzmann**, D. Mitchell, J. Sawyer, Q. Zhu, and M. Castellano. Extreme weather-year sequences have non-additive effects on environmental nitrogen losses. *Global Change Biology*, 2017; 24 e303-e317. <http://dx.doi.org/10.1111/gcb.13866>
- Valcu-Lisman, A.M., P.W. Gassman, R. Arritt, T. Campbell, and **D.E. Herzmann**. Cost-effectiveness of reverse auctions for watershed nutrient reductions in the presence of climate variability: An empirical approach for the Boone River watershed. *Journal of Soil and Water Conservation*, 2017; 72(3) 280-295. <http://dx.doi.org/10.2489/jswc.72.3.280>
- Hornbuckle B, J. Patton, A. VanLooke, A. Suyker, M. Roby, V. Walker, E. Iyer, D. Herzmann, and E Endacott. SMOS optical thickness changes in response to the growth and development of crops, crop management, and weather. *Remote Sensing of Environment*, 2016; 180 320333. <http://dx.doi.org/10.1016/j.rse.2016.02.043>
- Panagopoulos Y, Gassman P W, Arritt R W, **Herzmann D E**, Campbell T D, Valcu A, et al. Impacts of climate change on hydrology, water quality and crop productivity in the Ohio-Tennessee River Basin. *Int J Agric Biol Eng*, 2015; 8(3)
- **Herzmann, D.**, L. Abendroth, and L. Bunderson. 2014. Data management approach to multi-disciplinary agricultural research and syntheses. *Journal of Soil and Water Conservation*, 69(6), 180A-185A. <http://dx.doi.org/10.2489/jswc.69.6.180A>
- Panagopoulos, Y., P. Gassman, R. Arritt, **D. Herzmann**, T. Campbell, M. Jha, C. Kling, R. Srinivasan, M. White, and J. Arnold. 2014. Surface water quality and cropping systems sustainability under a changing climate in the Upper Mississippi River Basin, *Journal of Soil and Water Conservation*, 69(6), 483-494. <http://dx.doi.org/10.2489/jswc.69.6.483>
- M. Necplov, R.P. Anex, A.N. Kravchenko, L.J. Abendroth, S.J. Del Grosso, W.A. Dick, M.J. Helmers, **D. Herzmann**, J.G. Lauer, E.D. Nafziger, J.E. Sawyer, P.C. Scharf, J.S. Strock and M.B. Villamil. 2014. What does it take to detect a change in soil carbon stock? A regional comparison of minimum detectable difference and experiment duration in the North-Central United States. *Journal of Soil and Water Conservation*, 69(6), 517-531. <http://dx.doi.org/10.2489/jswc.69.6.517>
- Kladviko, E.J., M.J. Helmers, L.J. Abendroth, **D. Herzmann**, R. Lal, M. Castellano, D.S. Mueller, J.E. Sawyer, R.P. Anex, R.W. Arritt, B. Basso, J.V. Bonta, L. Bowling, R.M. Cruse, N.R. Fausey, J. Frankenberger, P. Gassman, A.J. Gassmann, C.L. Kling, A. Kravchenko, J.G. Lauer, F.E. Miguez, E.D. Nafziger, N. Nkongolo, M. O'Neal, L.B. Owens, P. Owens, P. Scharf, M.J. Shipitalo, J.S. Strock and M.B. Villamil. 2014. Standardized research protocols enable transdisciplinary research of climate variation impacts in corn production systems. *Journal of Soil and Water Conservation, Special Issue for Climate and Agriculture*. 69(6), 532-542. <http://dx.doi.org/10.2489/jswc.69.6.532>
- Panagopoulos, Y., P.W. Gassman, R.W. Arritt, **D.E. Herzmann**, T.D. Campbell, A. Valcu, M.K. Jha, C.L. Kling, R. Srinivasan, M. White and J.G. Arnold. 2014. Hydrologic, water quality and crop productivity impacts of climate change in the Ohio-Tennessee river basin. *International Journal of Agricultural and Biological Engineering*. In-review.
- Khanal, S., R. Anex, C. Anderson, and **D. Herzmann**, 2014: Streamflow Impacts of Biofuel Policy-Driven Landscape Change. *PloS one*, DOI: 10.1371/journal.pone.0109129
- Anderson, C., R. Anex, R. Arritt, B. Gelder, S. Khanal, **D. Herzmann** and P. Gassman. 2013. Regional climate impacts of a biofuels policy projection. *Geophysical Research Letters*. 40(6), 1217-1222. <http://dx.doi.org/10.1002/grl.50179>
- Mearns, L., S. Sain, L. Leung, M. Bukovsky, S. McGinnis, S. Biner, D. Caya, R. Arritt, W. Gutowski, E. Takle, M. Snyder, R. Jones, A. Nunes, S. Toker, **D. Herzmann**, L. McDaniel, and L. Sloan. 2013. Climate change projections of the north american regional climate change assessment program (NARCCAP), 120(4), *Climatic Change*, 965-975

- Khanal, S., R. Anex, C. Anderson, **D. Herzmann**, and M. Jha. 2013. Implications of biofuel policy-driven land cover change for rainfall erosivity and soil erosion in the United States. *Global Change Biology BioEnergy*, DOI: 10.1111/gcbb.12050
- Breakah, T.M., R. Williams, **D. Herzmann**, and E. Takle. 2010. The Effects of Utilizing Accurate Climatic Conditions for Mechanistic-Empirical Pavement Design, a Case Study. *Journal of Transportation Engineering*, 137(1), 8490.
- Coleman, T.A., K. Knupp, and **D. Herzmann**. 2010. An Undular Bore and Gravity Waves Illustrated by Dramatic Time-Lapse Photography. *J. Atmos. Oceanic Technol.*, 27, 1355-1361.
- Coleman, T.A., K. Knupp, and **D. Herzmann**. 2009. The Spectacular Undular Bore in Iowa on 2 October 2007, *Monthly Weather Review*, 137(1), 495-503.
- **Herzmann, D.E.**, J. Wolt, and R. Arritt. 2008. Representativity of a mesoscale network for weather-related factors governing pollen dispersal, *International Journal of Biometeorology*, 52(7), 617-624.
- Williams, C.L., M. Liebman, J. Edwards, D. James, J. Singer, R. Arritt, and **D. Herzmann**. 2006. Patterns of Regional Yield Stability in Association with Regional Environmental Characteristics, *Crop Science*, 48(4), 1545-1559.
- Cruse, R.M., D. Flanagan, J. Frankenberger, B.K. Gelder, **D. Herzmann**, D. James, W.F. Krajewski, M.M. Kraszewski, J.M. Laflen, J Opsomer and D. Today. 2006. Daily estimates of rainfall, water runoff, and soil erosion in Iowa, *Journal of Soil and Water Conservation*, 61(4), 191-199.

#### **Presentations (Conference/Outreach)**

- Herzmann, D., 2020. IEM Dog and Pony Show. San Antonio NWS, Ames, IA. Sep. 29, 2020.
- Herzmann, D., 2020. IEM and other things. Central Region NWS, Ames, IA. Sep. 22, 2020.
- Herzmann, D., 2020. The Weather Bureau and the IEM. Des Moines NWS, Johnston, IA. Feb. 20, 2020.
- Herzmann, D., 2020. Providing the E in G x E x M. ISU Agronomy 600B, Ames, IA. Feb. 5, 2020.
- Herzmann, D., 2019. Mesonet Refresher. ISU Crops Team In Service, Ames, IA. Apr. 2, 2019.
- Herzmann, D., 2019. IEM Dog and Pony Show. Pueblo NWS, Pueblo, CO. Mar. 20, 2019.
- Herzmann, D., 2018. IEM Dog and Pony Show. Pleasant Hill NWS, Kansas City, MO. Sep. 18, 2018.
- Herzmann, D., 2018. IEM Dog and Pony Show. Topeka NWS, Topeka, KS. Sep. 12, 2018.
- Herzmann, D., 2018. IEM Dog and Pony Show. North Platte NWS, North Platte, NE. Apr. 3, 2018.
- Herzmann, D., 2018. Utilizing Weather Station Data to Improve Crop Management. SE Iowa Ag Research Assoc, Iowa City, IA. Mar. 1, 2018.
- Herzmann, D., 2018. Big Weather Data for (sm)all Farmers. Big Data, Ames, IA. Feb. 27, 2018.
- Herzmann, D., 2018. NWS Valid Time Event Code (VTEC). Emergency Interoperability Consortium, Ames, IA. Feb. 21, 2018.
- Herzmann, D., 2017. IEM + GIS + Other Acronyms. ISU GIS Earth Observation Day, Ames, IA. Oct. 12, 2017.

- Herzmann, D., 2017. IEM: Making Weather Data Great Again. NWS Des Moines, Johnston, IA. Sep. 16, 2017.
- Herzmann, D., 2016. 2016 Russell L. DeSouza Award. UCAR, Boulder, CO. Sep. 26, 2016.
- Herzmann, D., 2016. The Case for Relational Databases. ISU Agronomy 590RD, Ames, IA. Sep. 12, 2016.
- Herzmann, D., 2016. IEM Dog and Pony Show. NWS Indianapolis, Indianapolis, IN. May. 25, 2016.
- Herzmann, D., 2015. Using the Mesonet. ISU Crops Team In Service, Ames, IA. Mar. 30, 2015.
- Herzmann, D., 2014. IEM Dog and Pony Show. National Weather Service, Chicago, IL. Nov. 10, 2014.
- Abendroth, L., D. Herzmann and L. Bunderson, 2014. Data management for regional transdisciplinary agricultural research: Approach and implementation. ASA-CSSA-SSSA Annual Meeting, Long Beach, CA. Nov. 2-5, 2014. <https://scisoc.confex.com/scisoc/2014am/webprogram/Paper89677.html>
- Gassman, P.W., Y. Panagopoulos, C.L. Kling, M. Jha, J. Arnold, M. White, R. Srinivasan, S. Rabotyagov, M. Moskal, J. Anderson, R.E. Turner, N. Rabalais, R. Arritt and D. Herzmann, 2013. Development and application of SWAT modeling systems for two large U.S. corn belt river basins. Northwest A&F University, Yangling, China. Oct. 29, 2014.
- Gassman, P.W., Y. Panagopoulos, C.L. Kling, M. Jha, J. Arnold, M. White, R. Srinivasan, S. Rabotyagov, M. Moskal, J. Anderson, R.E. Turner, N. Rabalais, R. Arritt and D. Herzmann, 2013. Development and application of SWAT modeling systems for two large U.S. corn belt river basins. Xi'an University of Technology, Xi'an, China. Oct. 28, 2014.
- Gassman, P., Y. Panagopoulos, R. Arritt, D. Herzmann, T. Campbell, C. Kling, M. Jha, R. Srinivasan, M. White and J. Arnold, 2014. Hydrologic, water quality and crop productivity impacts of climate change in the Ohio-Tennessee river basin. International SWAT Conference, Pernambuco, Brazil. July 28 - Aug. 1, 2014. <http://swat.tamu.edu/conferences/2014/material/july-31/d2/>
- Herzmann, D., 2014. IEM Dog and Pony Show. National Weather Service, Minneapolis, MN. Mar. 4, 2014.
- Gassman, P.W., Y. Panagopoulos, C.L. Kling, M. Jha, J. Arnold, M. White, R. Srinivasan, S. Rabotyagov, M. Moskal, J. Anderson, R.E. Turner, N. Rabalais, R. Arritt and D. Herzmann, 2013. Development and application of SWAT modeling systems for two large U.S. corn belt river basins. China Agricultural University, Beijing, China. Oct. 23, 2013.
- Herzmann, D., 2013. How much did it rain in Ames on June 25th, 2010?. ISU Geological and Atmospheric Sciences Fall 2013 Seminar Series. Sept. 3, 2013. Iowa State University.
- Panagopoulos, Y., P.W. Gassman, R. Arritt, D.E. Herzmann, T. Campbell, M.K. Jha, C.L. Kling, R. Srinivasan, M. White, and J.G. Arnold, 2013. Climate change effects on water pollution and crop production in the upper Mississippi river basin. CSCAP Annual Conference; Poster Symposium. West Lafayette, IN. July 29-Aug. 1, 2013. <http://sustainablecorn.org/Publications/Posters.html>
- Herzmann, D.E., L.J. Abendroth, and L.D. Bunderson, 2013. CSCAP data management: Utilizing multiple tools to accomplish team science. CSCAP Annual Conference; Poster Symposium. West Lafayette, IN. July 29-Aug. 1, 2013. <http://sustainablecorn.org/Publications/Posters.html>
- Herzmann, D. and L. Abendroth, 2013. CSCAP data management. REACCH Annual Conference. Portland, OR.

- Kling, C.L., P.W. Gassman, Y. Panagopoulos, R. Srinivasan, M.J. White, M.K. Jha, J.G. Arnold, R.E. Turner, S. Rabotyagov, J. Richardson, M.L. Moskal, N. Rabalais, R. Arritt, and D. Herzmann, 2013. An integrated modeling system to estimate Corn Belt Region nutrient load impacts on the Seasonal Gulf of Mexico Hypoxic Zone. ASABE Annual International Meeting, July 21-24, Kansas City, MO.
- Herzmann, D. and L. Abendroth, 2013. CSCAP data management: Utilizing multiple tools to accomplish team science. PINEMAP Annual Conference; Poster Symposium. Atlanta, GA.
- Herzmann, D., 2013. On the 2012 Drought and other items of interest. Professional Soil Classifiers of Iowa, Ames, IA. Mar. 2, 2013.
- Herzmann, D. and L. Abendroth, 2013. CSCAP Data Management: Utilizing multiple tools to accomplish team science. REACCH Annual Conference. Poster Symposium. Portland, OR.
- Herzmann, D. and L. Abendroth, 2012. Project collaboration and data management (whole team version). CSCAP Annual Conference. Wooster, OH. Aug. 7-9, 2012.
- Herzmann, D. and L. Abendroth, 2012. Project collaboration and data management (advisory board version). CSCAP Annual Conference. Wooster, OH. Aug. 7-9, 2012.
- Herzmann, D., 2012. Musings on Storm Based Warnings. National Weather Service, Omaha, NE. Apr. 12, 2012.
- Herzmann, D., 2011. Data management. CSCAP Annual Conference. Chicago, IL. Nov. 8-10, 2011.
- Wilke, A., J. Benning, C. Ingels, D. Herzmann, and L.W. Morton, 2011. Making climate change visible to farmers. CSCAP Annual Conference. Chicago, IL. Nov. 8-10, 2011.  
[http://www.sustainablecorn.org/doc/posters/2011/2011\\_26-Wilke.pdf](http://www.sustainablecorn.org/doc/posters/2011/2011_26-Wilke.pdf)
- Gelder, B., C. Anderson, R. Arritt, R. Anex, D. Herzmann, and P. Gassman, 2011. Environmental Impacts of Continental Scale Biofuel Production. ASA-CSSA-SSSA Annual Meeting, Oct. 19, 2011. <https://dl.sciencesocieties.org/publications/meetings/2011am/8440/66332>
- Herzmann, D., 2011. Musings on Storm Based Warnings. Central Iowa National Weather Association Annual Meeting, Des Moines, IA. Apr. 1, 2011.
- Gelder, B., R. Anex, D. Herzmann, P. Gassman, C. Anderson, M. Jha, and R. Arritt, 2010. Climatological Impacts of Biofuel Production. ASA-CSSA-SSSA Annual Meeting, Nov. 3, 2010. <https://dl.sciencesocieties.org/publications/meetings/2010am/7692/61374>
- Herzmann, D., 2009. IEM Potpourri. ISU Meteorology Seminar, Ames, IA. Sep. 22, 2009.
- Herzmann, D., 2008. IEM: Using Open Source GIS Tools and Web Services to Disseminate Environmental Data. UNI GEOTree Seminar, Cedar Falls, IA. Feb. 28, 2008.
- Herzmann, D., 2007. Iowa Environmental Mesonet. ISU Experiment Station Meeting, Ames, IA. Dec. 19, 2007.
- Herzmann, D., 2007. IEM (Where's the Science?). ISU Meteorology Seminar, Ames, IA. Nov. 27, 2007.
- Herzmann, D., 2007. IEM: Using Open Source GIS Tools and Web Services to Disseminate Environmental Data. University of Wisconsin GIS Day, Madison, WI. Nov. 7, 2007.
- Herzmann, D., 2007. IEM: Supporting the real-time and research needs of the national severe weather community. Central Iowa National Weather Association Annual Meeting, Des Moines, IA. Mar. 24, 2007.

- Herzmann, D., 2007. IEM Chat and other things that should interest the audience. National Weather Service Central Region SOO/WCM Conference, Kansas City, MO. Feb. 14, 2007.
- Herzmann, D., 2006. NWS VTEC/Polygon Stuff. NWS Storm Based Warnings Workshop, College Station, TX. Dec. 5, 2006.
- Herzmann, D., J. Wolt, R. Arritt, M. Westgate, and S. Goggi, 2006. Modeling Out Crossing Probabilities for Maize in Iowa. Agronomy Society Annual Meeting, Indianapolis, IN. Nov. 14, 2006.
- Herzmann, D., 2006. IEM Update: From pollen torivers to pavements to soils and a whole lot more. ISU Meteorology Seminar, Ames, IA. Oct. 10, 2006.
- Herzmann, D., 2006. IEM Chat: A New Platform for Building NWS and Media Partnerships. Central Iowa National Weather Association Annual Meeting, Des Moines, IA. Mar. 25, 2006.
- Herzmann, D. and R. Arritt, 2005. Using Open GIS web services to serve environmental data. Iowa-NASA Data Integration Workshop, Ames, IA. Apr. 20, 2005.
- Herzmann, D. and R. Arritt, 2005. UsingOpenGIS webservices toserve environmental data. American Meteorological Society Annual Meeting, San Diego, CA. Jan. 12, 2005.

## Media

- Herzmann, D., 2020. Mesonet provides information for research, forecasts. Inside Iowa State. <https://www.inside.iastate.edu/article/2020/11/05/mesonet>
- Herzmann, D. and W. Klein, 2013. Iowa environmental mesonet data used by thousands every day. Iowa State University Extension and Outreach. Sept. 30, 2014. <http://www.extension.iastate.edu/article/iowa-environmental-mesonet-data-used-thousands-every-day>
- Love, O. (Daryl Herzmann cited), 2013. Wacky weather changing lowans climate change perceptions. Cedar Rapids Gazette. Aug. 10, 2013. <http://thegazette.com/2013/08/10/wacky-weather-changing-iowans-climate-change-perceptions/>
- Weather Brains (online netcast), 2012. Episode 334. <http://weatherbrains.com/weatherbrains/?p=2869>