

# Grant B. Weller

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## CONTACT INFORMATION

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## EDUCATION

**Colorado State University**, Fort Collins, CO

Ph.D., Statistics, May 2013

- Dissertation Title: *Joint Tail Modeling via Regular Variation with Applications in Climate and Environmental Studies*
- Adviser: Dan Cooley

M.S., Statistics, December 2010

**Concordia College**, Moorhead, MN

B.A., Mathematics and Economics, May 2008

- *Magna cum Laude*
- GPA: 3.85

## RESEARCH INTERESTS

Extreme value theory, multivariate extremes, heavy-tail phenomena; applications in climate, environmental modeling, astronomy, and finance; time series modeling; applications of statistical and machine learning methods in medicine, healthcare, and econometric forecasting; social network analysis.

## ACADEMIC AND PROFESSIONAL EXPERIENCE

**Savvysherpa, Inc.**, Minneapolis, MN

*Senior Research Scientist*  
*Research Scientist*

**February 2015 to current**  
**June 2014 to February 2015**

- Conduct primary and secondary research in Biostatistics, econometric forecasting, and social network analysis.
- Develop statistical and machine learning methods for predictive analytics in healthcare.
- Collaborate with social scientists and domain experts applying scientific methods to solve business problems.

**Department of Statistics, Carnegie Mellon University**, Pittsburgh, PA

*Visiting Assistant Professor*

**August 2013 to June 2014**

- Conducted methodological and applied statistical research.
- Instructor for graduate and undergraduate statistics courses.

**Department of Statistics, Colorado State University**, Fort Collins, CO

*Postdoctoral Fellow*

**June 2013 to July 2013**

**National Center for Atmospheric Research**, Boulder, CO

*IMAGe Visitor*

**May 2011 to July 2013**

- Examined extremal dependence in west coast precipitation between observational data and NARCCAP regional climate models
- Built an index connecting pineapple express extreme precipitation to large-scale atmospheric processes

**Statistical and Applied Mathematical Sciences Institute**, Research Triangle Park, NC

*Graduate Student Visitor* **August 2011 to December 2011**

- Participant in 2011-2012 program on Uncertainty Quantification
- Working group: Statistics of Extremes

**Department of Statistics, Colorado State University**, Fort Collins, CO

*Graduate Research Assistant* **January 2011 to May 2013**

- Conducted research in multivariate extremes under the direction of Dr. Dan Cooley
- Developed R examples for STAT 511/512 under the direction of Dr. Phillip Chapman (Spring 2011)

**Graybill Statistical Laboratory, Colorado State University**, Fort Collins, CO

*Programming Consultant* **January 2009 to August 2009**

- Provided walk-in statistical consulting to the general campus community

**Worcester Polytechnic Institute**, Worcester, MA

*Research Experience for Undergraduates* **June 2007 to July 2007**

- Collaborated with four other students on two projects sponsored by State Street Global Advisors, Boston, MA
- Produced a model to rank future performance of stocks
- Explored methods for bond portfolio optimization

**Concordia College Academic Enhancement Center**, Moorhead, MN

*Mathematics Tutor* **January 2005 to May 2008**

- Walk-in tutor for a variety of undergraduate mathematics courses

OTHER  
PROFESSIONAL  
EXPERIENCE

**U.S. Environmental Protection Agency**

*Ad hoc member, FIFRA Scientific Advisory Panel* **December 2–4, 2014**

TEACHING  
EXPERIENCE

**Carnegie Mellon University**, Pittsburgh, PA

*Visiting Assistant Professor* **August 2013 to June 2014**

- Primary Instructor for 36-762: Applications of Extreme Value Theory, Fall 2013
- Co-Primary Instructor for 36-303: Sampling, Survey, and Society, Spring 2014

**Colorado State University**, Fort Collins, CO

*Graduate Teaching Assistant* **August 2008 to December 2010,  
January 2012 to May 2013**

- Primary Instructor for STAT 301: Introduction to Statistical Methods
  - Fall 2010
  - Responsible for 1 hour lecture and supervision of 95 undergraduate students
  - Developed original course material (~ 80%)
- Primary Instructor for STAT 204: Statistics for Business Students
  - Summer 2010

- Teaching Assistant for STAT 204: Statistics for Business Students
  - Fall 2008, Spring 2010
  - Guided weekly 1 hour recitation sections.
- Teaching Assistant for STAT 201: General Statistics
  - Fall 2009
- Grader for graduate-level courses
  - STAA 574: Methods in Multivariate Analysis (*Dr. Dan Cooley*), Spring 2013
  - STAA 576: Methods in Environmental Statistic (*Dr. Dan Cooley*), Spring 2013
  - STAT 675: Bayesian Statistics (*Dr. Jennifer Hoeting*), Fall 2012
  - STAT 523: Quantitative Spatial Analysis (*Dr. Dan Cooley*), Spring 2012

PUBLICATIONS

- Weller, G.B., Lovely, J., Larson, D.W., Earnshaw, B.A., and Huebner, M. (2017). Leveraging electronic health records for predictive modeling of post-surgical complications. *Statistical Methods in Medical Research*, in press.
- Tang, M. and Weller, G.B. (2016). Bivariate tail risk analysis for high-frequency returns via extreme value theory. *Model Assisted Statistics and Applications*, in press.
- Weller, G.B. and Eddy, W.F. (2015). Multivariate order statistics: theory and application. *Annual Reviews of Statistics and its Application*, **2**:237–257.
- Weller, G.B. and Cooley, D. (2014). A sum characterization of hidden regular variation with likelihood inference via expectation–maximization. *Biometrika*, **101**(1):17–36.
- Weller G.B., Cooley, D., Sain, S., Bukovsky, M., and Mearns, L.O. (2013). Two case studies on NARCCAP precipitation extremes. *Journal of Geophysical Research - Atmospheres*, **118**(18):10,475–10,489.
- Weller, G.B., Cooley, D., and Sain, S. (2012). An investigation of the pineapple express phenomenon via bivariate extreme value theory. *Environmetrics* **23**(5):420–439.

TECHNICAL REPORTS AND MANUSCRIPTS

- Weller, G.B. (2015). Modeling and prediction of generic pharmaceutical utilization via Bayesian structural time series. *Savvysherpa technical report*.
- Weller, G.B. (2013). Joint Tail Modeling via Regular Variation with Applications in Climate and Environmental Studies. *PhD Dissertation, Colorado State University, Fort Collins, CO*.
- Weller, G.B. and Cooley, D. (2012). An alternative characterization of hidden regular variation in joint tail modeling. *CSU Department of Statistics Technical Report*.

WORKS IN PREPARATION

- Huebner, M., Larson, D.W., Lovely, J., and Weller, G.B. (2015+). Co-occurrence of complications following colorectal surgery. *In preparation*.
- Cisewski, J., Weller, G.B., Schafer, C.M., and Hogg, D.W. (2015+). Approximate Bayesian computation for the stellar initial mass function. *In revision*.

INVITED TALKS

- Modeling Multivariate Extreme Values via Regular Variation: an Application to High-Frequency Financial Returns
  - *Department of Statistics Environmental Seminar, North Carolina State University, Raleigh, NC*. March 3, 2015.
- Inference for Hidden Regular Variation in Multivariate Extremes.
  - *Department of Statistics Seminar, Columbia University, New York, NY*. April 14, 2014.

Investigating NARCCAP Precipitation Extremes via Bivariate Extreme Value Theory.  
• *American Geophysical Union Fall Meeting, San Francisco, CA.* December 12, 2013.

Tail Dependence and its Applications.

- *Applied Probability and Statistics Seminar, University of St. Thomas, St. Paul, MN.* December 6, 2013.

Bivariate Extreme Value Analyses of NARCCAP Precipitation Extremes.

- *Department of Meteorology Colloquium, Pennsylvania State University, State College, PA.* October 2, 2013.

A Sum Characterization of Hidden Regular Variation in Joint Tail Modeling with Likelihood Inference via the MCEM Algorithm.

- *Eighth International Conference on Extreme Value Analysis, Shanghai, China.* July 11, 2013.
- *Department of Statistics Seminar, Carnegie Mellon University, Pittsburgh, PA.* January 28, 2013.
- *Department of Statistics Colloquium, University of Missouri, Columbia, MO.* January 24, 2013.

Flooding to Financial Disaster: An Introduction to Extreme Value Theory.

- *Concordia College Mae Anderson Alumni Talks, Moorhead, MN.* January 20, 2012.

CONTRIBUTED  
TALKS

Quantifying Tail Risk in Health Insurance Pools using Extreme Value Theory.

- *Joint Statistical Meetings (topic-contributed), Chicago, IL.* August 1, 2016.

Leveraging Electronic Health Records for Predictive Modeling of Surgical Complications.

- *International Society for Clinical Biostatistics 2015 Meeting, Utrecht, Netherlands.* August 26, 2015.

Bayesian Forecasting of Generic Pharmaceutical Utilization via Dynamic Linear Models.

- *Joint Statistical Meetings, Seattle, WA.* August 13, 2015.

Inference for Hidden Regular Variation in Multivariate Extremes.

- *2014 SIAM Conference on Uncertainty Quantification, Savannah, GA.* March 31, 2014.
- *Department of Statistics Seminar, University of Wisconsin-Madison, Madison, WI.* September 23, 2013.

Estimation of Hidden Regular Variation Structures in Multivariate Extremes.

- *Space-time working group, University of Washington, Seattle, WA.* April 22, 2013.

A Sum Characterization of Hidden Regular Variation in Joint Tail Modeling with Likelihood Inference via the MCEM Algorithm.

- *Joint Mathematics Meetings, Baltimore, MD.* January 17, 2014.
- *IMAGe brown bag seminar, NCAR, Boulder, CO.* January 18, 2013.

An Alternative Representation of Hidden Regular Variation in Multivariate Extremes.

- *2012 WNAR - Graybill Conference, Fort Collins, CO.* June 18, 2012.
- *SAMSI UQ: Transition Workshop, Research Triangle Park, NC.* May 23, 2012.
- *Student Organized Activities and Research Seminars (SOARS), CSU Department of Statistics, Fort Collins, CO.* May 18, 2012.

An Investigation of the Pineapple Express Phenomenon via Bivariate Extreme Value Theory.

- *Joint Statistical Meetings (topic-contributed), San Diego, CA.* July 31, 2012.

- *Student Organized Activities and Research Seminars (SOARS), CSU Department of Statistics, Fort Collins, CO.* July 23, 2012.
- *Colorado/Wyoming ASA Chapter Spring Meeting, Boulder, CO.* April 20, 2012.
- *2012 NARCCAP Fourth Users' Meeting, Boulder, CO.* April 11, 2012.
- *SIAM 2012 Conference on Uncertainty Quantification, Raleigh, NC.* April 5, 2012.
- *Cooperative Institute for Research in the Atmosphere (CIRA) seminar, Fort Collins, CO.* February 29, 2012.
- *Student Organized Activities and Research Seminars (SOARS), CSU Department of Statistics, Fort Collins, CO.* February 27, 2012.

Hidden Regular Variation, Second order Regular Variation, and Asymptotic Independence.

- *SAMSI UQ: Statistics of Extremes working group meeting.* February 6, 2012.

Modeling the Pineapple Express Phenomenon via Multivariate Extreme Value Theory.

- *IMAGe brown bag seminar, NCAR, Boulder, CO,* May 31, 2011.
- *Student Organized Activities and Research Seminars (SOARS), CSU Department of Statistics, Fort Collins, CO.* June 1, 2011.

POSTER  
PRESENTATIONS

Bivariate Extreme Value Analyses of NARCCAP Precipitation Extremes.

- *Climate Informatics 2013 Workshop, Boulder, CO.* September 27, 2013.

A New Representation of Hidden Regular Variation in Multivariate Extremes.

- *ASA Section on Statistics and the Environment Workshop, Raleigh, NC.* October 5, 2012.

An Investigation of the Pineapple Express Phenomenon via Bivariate Extreme Value Theory.

- *Ten Lectures in Statistical Climatology, Seattle, WA.* August 6, 2012.
- *SAMSI/CICS UQ: Observations Workshop, Asheville, NC.* January 17, 2012.
- *American Geophysical Union Fall Meeting, San Francisco, CA.* December 6, 2011.
- *World Climate Research Programme Open Science Conference, Denver, CO.* October 27, 2011. Recipient, *Outstanding Poster Presentation* award.

Modeling the Pineapple Express Phenomenon via Multivariate Extreme Value Theory.

- *SAMSI program on Uncertainty Quantification: Methodology Opening Workshop, Research Triangle Park, NC.* September 8, 2011.
- *SAMSI program on Uncertainty Quantification: Climate Modeling Opening Workshop, Pleasanton, CA.* August 30, 2011.

OTHER  
PRESENTATIONS

Regression Models: Applications, Transformations, and Interpretations.

- *Savvysherpa internal presentation, Minneapolis, MN.* October 28, 2014.

Joint Tail Modeling via Regular Variation with Applications in Climate and Environmental Studies.

- *CSU Department of Statistics PhD Final Examination, Fort Collins, CO.* March 15, 2013.
- *CSU Department of Statistics PhD Preliminary Examination, Fort Collins, CO.* June 13, 2012.

HONORS AND  
AWARDS

- J.E. Moyal Award for Excellence in Applied Probability (CSU Department of Statistics), May 2013.
- Best student oral presentation award winner at 2012 WNAR - Graybill Conference, June 2012.
- Elmer E. Remmenga Scholarship in Applied Statistics (CSU Department of Statistics), April 2012.

- “Outstanding Poster Presentation” selection at WCRP Open Science Conference for “An Investigation of the Pineapple Express Phenomenon via Bivariate Extreme Value Theory”, October 2011.
- James S. Williams Memorial Scholarship (CSU Department of Statistics), 2008-2009.
- Dean’s List, Concordia College, 2004-2008.
- National Science and Mathematics Access to Retain Talent (SMART) grant, Concordia College, 2007-2008.
- Team captain, Concordia College football, 2007.
- ESPN the Magazine/CoSIDA Academic All-America football team, 2007.

SERVICE

- Referee for:
  - Conference on Learning Theory (COLT 2015)
  - Environmental and Ecological Statistics
  - Environmetrics (4 manuscripts)
  - Extremes
  - Journal of Climate
  - Model Assisted Statistics and Applications
  - Statistics and its Interface
  - Statistics in Medicine
- Carnegie Mellon University Department of Statistics seminar committee, 2013–2014
- Twin Cities Chapter of the American Statistical Association
 

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|--------------------------------|-------------|
| <i>Past President</i>          | <b>2017</b> |
| <i>President</i>               | <b>2016</b> |
| <i>Secretary and Webmaster</i> | <b>2015</b> |

  - Co-organizer, 2016 Fall Research Meeting at Medtronic in Mounds View, MN.
  - Co-organizer, 2016 Spring Banquet at Surly Brewing in Minneapolis, MN.
  - Co-organizer, 2015 Fall Research Meeting at Mayo Clinic in Rochester, MN.

PROFESSIONAL AFFILIATIONS

- Member, AcademyHealth, 2016-present.
- Member, American Statistical Association (ASA), 2008-present.
  - Colorado–Wyoming chapter, 2010–2013
  - Pittsburgh chapter, 2013–2014
  - Twin Cities chapter, 2014–present
- Member, American Geophysical Union (AGU), 2011–2014.
- Member, Society for Industrial and Applied Mathematics (SIAM), 2011–2014.

## REFERENCES

- Dan Cooley, *Associate Professor*. Colorado State University Department of Statistics.
  - Phone: (970) 491-5721
  - Email: cooleyd@stat.colostate.edu
- Bill Eddy, *John C. Warner Professor of Statistics (emeritus)*. Carnegie Mellon University Department of Statistics.
  - Phone: (412) 468-2725
  - Email: bill@cmu.edu
- Jay Breidt, *Professor and Associate Chair*. Colorado State University Department of Statistics.
  - Phone: (970) 491-6786
  - Email: jbreidt@stat.colostate.edu
- Stephan Sain, *Senior Quantitative Researcher*. The Climate Corporation.
  - Email: steve.sain@climate.com