

# CURRICULUM VITAE

## NAME

Jarrett Jay Barber

## ADDRESS

Arizona State University  
School of Mathematical & Statistical Sciences  
Tempe, AZ 85287-1804

## PHONE

work: (480) 965-3791

## EDUCATION

- 2002      Ph.D., Statistics, North Carolina State University, Raleigh, NC.  
Title of Ph.D. Thesis: Modeling and prediction of non-stationary  
environmental processes
- 1997      M.S., Mathematics, Northern Arizona University, Flagstaff, AZ
- 1992      M.S., Forestry, Northern Arizona University, Flagstaff, AZ
- 1990      B.S., Forestry, Northern Arizona University, Flagstaff, AZ

## ACADEMIC POSITIONS

- 2011 - present Assistant Professor, Statistics, School of Mathematical & Statistical  
Sciences, Arizona State University, Tempe, AZ
- 2006 - 2010 Assistant Professor, Statistics, Department of Statistics, University  
Wyoming, Laramie, WY
- 2004 - 2006 Assistant Professor, Statistics, Department of Mathematical Sciences,  
Montana State University, Bozeman, MT
- 2002 - 2004 Visiting Assistant Professor, Statistics, Institute of Statistics & Decision  
Sciences, Duke University, Durham, NC
- 2002 - 2004 Visiting Scientist, Statistics, Geophysical Statistics Project, National  
Center for Atmospheric Research, Boulder, CO

## OTHER POSITIONS

- 1999 - 2001 NSF/VIGRE Graduate Student Fellow, Department of Statistics, North  
Carolina State University, Raleigh, NC

- 1999 - 2000 Associate, Environmental Careers Organization, Raleigh, NC
- 1999 Environmental Protection Specialist, U.S. Environmental Protection Agency, RTP, NC
- 1997 - 1998 Graduate Teaching Assistant, Department of Statistics, North Carolina State University, Raleigh, NC
- 1996 - 1997 Graduate Research Assistant, Department of Mathematics, Northern Arizona University, Flagstaff, AZ
- 1991 - 1992 Task Leader, USDA Forest Service Nationwide Forestry Applications Program (NFAP) (currently Remote Sensing Applications Center, RSAC), Salt Lake City, UT

### TEACHING (Wyoming)

<u>Year</u>	<u>Semester</u>	<u>Course No./Title</u>	<u>Cr. Hrs.</u>	<u>Enrollment</u>
2006	Fall	STAT 3050 Stat. Methods	3	13
2006	Fall	STAT 4360 Spatial Stat.	3	11
2007	Fall	STAT 4360 Spatial Stat.	3	4
2008	Spring	STAT 4220 Basic Engr. Stat.	3	50
2008	Spring	STAT 5680 Adv. Bayes. Stat.	3	3
2008	Fall	STAT 4220 Basic Engr. Stat.	3	50
2009	Fall	STAT 4-5015 Reg. Analysis	3	12
2009	Fall	STAT 4-5360 Spatial Stat.	3	9
2010	Spring	STAT 5680 Adv. Bayes. Stat.	3	5
2010	Fall	STAT 5620 Theo. of Linear Models	3	7

### PUBLICATIONS IN PROGRESS

(\* = student)

#### **In Preparation:**

\*Gemoets, Darren E., **Jarrett J. Barber**, and Kiona Ogle. Reversible jump MCMC for inference in a deterministic individual-tree-based growth model for studying forest dynamics. Journal to be determined.

\*Gemoets, D.E., K. Ogle, and **Jarrett J. Barber**. Bayesian parameter estimation for partial differential equation models. To be submitted to *Bayesian Analysis*.

**Jarrett J. Barber**, \*Pritma Gupta, William Edwards, Lance Waller. Combining and comparing multiple serial dilution assays for inferring particle concentration. To be submitted to *Biometrics*.

Huzurbazar, S., **Jarrett J. Barber**. Bayesian hierarchical modeling of particle size data. To be submitted to the *Journal of the Royal Statistical Society, Series C (Applied Statistics)*.

**Under Review:**

\*Angstmann, J.L., B.E. Ewers, and **Jarrett J. Barber**, and H. Kwon. Testing transpiration drivers by quantifying spatial variability along a boreal black spruce forest drainage gradient. *Oecologia*. Refereed.

**Barber, Jarrett J.**, Kenneth G. Gerow, Patrick Connolly and \*Sarabdeep Singh. Estimating incursion of hatchery fish into a wild population: a Bayesian Approach. *North American Journal of Fisheries Management*. Refereed.

Ogle, Kiona, **Jarrett J. Barber**, Karla Sartor. Feedback and modularization in a Bayesian meta-analysis of tree traits affecting forest dynamics. *Bayesian Analysis*.

**PUBLISHED WORKS**

**Refereed Journal Articles:**

Ogle, K., **J.J. Barber** (2011). Bayesian Statistics. In: A. Hastings, L. Gross (Eds.). *Sourcebook in Theoretical Ecology*. University of California Press, Berkeley. In press.

Prager, Steven D. and **Jarrett J. Barber** (2011). Using derived information to inform estimation of true position from uncertain data. *International Journal of Geographical Information Science*. Accepted.

Ogle, Kiona., **Jarrett J. Barber**, Cynthia Willson and \*Brenda Thompson (2009). Hierarchical statistical modeling of xylem vulnerability to cavitation. *New Phytologist*, 82(2) 541-554.

**Barber, Jarrett J.** and Steve D. Prager (2008). Combining multiple maps of line features to infer true position. *Bayesian Analysis* 3(3):625-658.

Ogle, Kiona and **Jarrett J. Barber** (2008). Bayesian data-model integration in plant physiological and ecosystem ecology. *Progress in Botany* 69:281-311.

**Barber, Jarrett J.**, and Alan E. Gelfand (2007). Hierarchical spatial modeling for estimation of population size. *Environmental and Ecological Statistics* 14(3):193-205.

**Barber, Jarrett J.** (2007). Using rubber sheets to infer true map location. *CHANCE* 20(1):49-54.

**Barber, Jarrett J.**, Alan E. Gelfand and John A. Silander, Jr. (2006). Modeling map positional error to infer true feature location. *Canadian Journal of Statistics* 34(4):659-676.

Bernhardt, E.S, **J.J. Barber**, J.S. Pippen, L. Taneva, J.A. Andrews and W.H. Schlesinger (2006). Long-term effects of free air CO<sub>2</sub> enrichment (FACE) on soil respiration. *Biogeochemistry* 77(1):91-116.

#### **Non-Refereed Proceedings/Transactions:**

Huzurbazar, S., and **Jarrett Barber** (2009). Bayesian modelling of grain size distributions. Proceedings of the 24th International Workshop on Statistical Modelling, Booth, James G. Editor. 174-181.

**Barber, Jarrett J.**, and Montserrat Fuentes (2000). Modeling and prediction of nonstationary spatial environmental processes. Proceedings of the 2000 Joint Statistical Meetings, Section on Statistics and the Environment.

#### **Other:**

**Barber, Jarrett J.** and Sarabdeep Singh (2010). A model for inferring the stray ratio of hatchery fish. University of Wyoming Department of Statistics Technical Report 2-10.

**Barber, Jarrett J.** (2009). Final Report: Understanding forest responses to climate change: integration of large datasets and mechanistic models of carbon dynamics. Final report in partial fulfillment of NASA Space Grant NNG05G165H (UW project ID NASA41150). 10 pp.

**Barber, Jarrett J.** (2008). Book Review of *Bayesian Core: A Practical Approach to Computational Bayesian Statistics*. Jean-Michel Marin and Christian P. Robert. New York, NY: Springer, 2007. ISBN 978-0-387-38979-0. *Journal of the American Statistical Association*, 103(481): 432-433.

#### **CONTRACTS & GRANTS**

##### **Funded Projects as PI:**

2008 Wyoming NASA Space Grant Faculty Research Initiation Grant: Understanding forest responses to climate change: integration of large datasets and mechanistic models of carbon dynamics, \$20,000.00

- 2006 Basic Research Grant: Statistical modeling to characterize map positional uncertainty and to infer about true map positions, University of Wyoming College of Arts & Sciences, \$2,500.00

**Funded Projects as Co-PI:**

- 2010 A Bayesian framework for enabling predicative simulation and uncertainty quantification in history matching geological models for CO<sub>2</sub> injection. PI: Victor Ginting (UW Math), Co-PI: Felipe Pereira (UW Math) University of Wyoming Center for Subsurface Flow and School of Energy Resources. \$233,861. 3 years.

- 2009 A theoretical and computational framework for linking tree form and function to forest diversity and productivity. PI: Kiona Ogle (University of Wyoming). NSF Advances in Biological Informatics, \$808,673. Summer 2009 to Summer 2012.

Modeling and analysis of 35 years of elk brucellosis data in the Greater Yellowstone Ecosystem. Co-PI: William Edwards (WGFD), Terry Kreeger (WGFD), Brandon Scurlock, (WGFD), Todd Cornish (UW Vet Sciences). USDA CSREES. \$33,644. Summer 2009 to summer 2010.

**Proposals not accepted as PI:**

- 2011 Modularization and feedback control for combining multiple multi-module models. CoPI: Kiona Ogle, NSF DMS Statistics, \$643,638.

**Proposals not accepted as CoPI:**

- 2008 A theoretical framework for linking tree form and function to forest diversity and productivity. PI: Kiona Ogle, NSF Advancing Theory in Biology, \$695,802.
- 2007 Bayesian integration of geospatial context for estimation of positional uncertainty, CoPI: Steve Prager, National Geospatial-Intelligence Agency (NGA) University Research Initiatives (NURI), \$557,020.84.
- 2006 QEIB: Collaborative Research: An integrative framework for accelerated learning in ecological systems with application to the study of carbon and water cycles in a desert ecosystem, CoPIs: Travis E. Huxman, Kiona Ogle, National Science Foundation, \$700,699.00.

**PROFESSIONAL AFFILIATIONS AND ACTIVITIES**

**Memberships in professional societies:**

American Statistical Association (ASA)  
International Society for Bayesian Analysis (ISBA)

**Office in professional societies:**

American Statistical Association Section on Statistics and the Environment  
**Program Chair-Elect** (March 2010 – present)

American Statistical Association Section on Statistics and the Environment JSM  
Presentation Awards Committee **Chair** (2007)

American Statistical Association Section on Statistics and the Environment JSM  
Presentation Awards Committee **Vice Chair** (2006)

American Statistical Association Montana **Chapter Representative** (2004 –  
2006)

**Review/editorial boards:**

Ecological Society of America (ESA) Board of Editors Subject Matter Editor  
(April 2010 – present)

**Grant Refereeing:**

NSF Methodology, Measurement, and Statistics (MMS) Program (1)

**Manuscript refereeing:**

*Ecological Modelling* (1) • *Ecological Monographs* (1) • *Ecology* (4) •  
*Environmental and Ecological Statistics* (3) • *Environmetrics* (3) • *Forest Science*  
(2) • *International Journal of Geographic Information Science* (5) • *Journal of*  
*the American Statistical Association* (4) • *Journal of Computational and*  
*Graphical Statistics* (1) • *Journal of the Royal Statistical Society (C)* (1) • *Journal*  
*of Vegetation Science* (2) • *North American Journal of Fisheries Management* (1)  
• *Proceedings of the Royal Society B: Biological Sciences* (5) • *Water Resources*  
*Research* (1) • *Weather and Forecasting* (1)

**HONORS AND AWARDS**

1999-2002	NSF/VIGRE Fellowship, Statistics, NCSU, Raleigh, NC
1998	Mu Sigma Rho National Statistics Honorary Society, NCSU, Raleigh, NC
1998	Outstanding M.S. Candidate, Statistics, NCSU, Raleigh, NC
1997	Outstanding Teaching Assistant, Mathematics, NAU, Flagstaff, AZ
1990 - 1992	ARCS Foundation Fellowship, Forestry, NAU, Flagstaff, AZ
1990	Valedictorian, Forestry, NAU, Flagstaff, AZ
1989	The Honor Society of Phi Kappa Phi, NAU, Flagstaff, AZ

**PAPERS PRESENTED/SYMPOSIA/INVITED**  
**LECTURES/PROFESSIONALMEETINGS/WORKSHOPS**

- 2011 Combining and comparing multiple serial dilution assays for inferring particle concentration. **Contributed talk.** Joint Statistical Meetings, July 30-August 4 2011, Miami, FL.
- Estimating particle concentration using multiple serial dilution assays, with application to brucellosis in elk of the Greater Yellowstone Ecosystem. **Invited talk.** Arizona State University Mathematical & Natural Sciences Seminar, March 3, 2011, Glendale, AZ. (with Pritam Gupta (student), Kiona Ogle, William Hank Edwards & Lance Waller)
- 2010 Analysis and modeling of elk brucellosis prevalence in the Greater Yellowstone Ecosystem. **Contributed talk.** Joint Statistical Meetings, July 31- August 5, 2010, Vancouver, BC, Canada. (with speaker Pritam Gupta (student), Kiona Ogle, William Hank Edwards & Lance Waller)
- 2009 Reversible jump MCMC for inference in a deterministic individual-tree- based growth model for studying forest dynamics. **Contributed talk.** Joint Statistical Meetings, August 1- August 6, 2009, Washington, DC. (with Darren Gemoets & Kiona Ogle)
- Statistical methods for modeling populations in ecology. Contributed Talk Session. **Session chair.** Joint Statistical Meetings, August 1- August 6, 2009, Washington, DC.
- A theoretical and statistical modeling framework for linking tree form and function to forest diversity and productivity. **Invited speaker.** UW-NCAR Days II. Workshop to explore opportunities for collaborations between UW and NCAR. May 19-20, 2009, Boulder, CO. (with Kiona Ogle & Darren Gemoets).
- 2008 Data-model integration for forest dynamics. **Topic contributed poster.** Joint Statistical Meetings, August 3-7, 2008, Denver, CO. (with Kiona Ogle and Darren Gemoets)
- 2007 Using map feature linearity to infer true position. **Invited speaker.** Colorado State University Department of Statistics Seminar. November 26, 2007, Fort Collins, CO. (with Steve Prager)
- UW-NCAR Days. Workshop to explore opportunities for collaborations between UW and NCAR. **Invited participant.** November 9-10, 2007, Steamboat Springs, CO.

- Data-model assimilation in ecology: techniques and applications. NSF-sponsored workshop. **Invited participant.** October 22-24, 2007, University of Oklahoma, Norman, OK.
- Using the linearity of map features in statistical modeling of map positional error. **Talk.** University of Wyoming Department of Statistics seminar, September 21, 2007, Laramie, WY. (with Steve Prager)
- GIS, map accuracy and statistics. **Session organizer.** Joint Statistical Meetings, July 29- August 2, 2007, Salt Lake City, UT.
- Using the linearity of map features in statistical modeling of map positional error. **Topic contributed talk.** Joint Statistical Meetings, July 29- August 2, 2007, Salt Lake City, UT. (with Steve Prager)
- Statistical modeling for map positional error. **Paper session talk.** Annual Meetings of the American Association of Geographers, April 17-21, 2007, San Francisco, CA. (with Steve Prager)
- 2006 Modeling precipitation network data when station reporting times are misaligned. **Topic contributed talk.** Joint Statistical Meetings, August 6-10, 2006, Seattle, WA. (with Alan E. Gelfand & Doug Nychka)
- Getting your fish through a tube: the passage of fish through culverts on a tributary of the Yellowstone River. **Invited talk.** Mathematical Biosciences Institute (MBI) Workshop 5: Uncertainty in Ecological Analysis, April 3-6, 2006, The Ohio State University, Columbus, OH. (with Andrew Solcz, Thomas McMahon, Joel Cahoon, Robert Gresswell, Jesse Patton, & Matt Blank)
- 2005 Modeling map positional error to infer about true feature location. **Talk.** Montana, American Statistical Association Montana Chapter Meeting, Sept 20, 2005, Butte, MT. (with Alan E. Gelfand & John A. Silander, Jr.)
- Modeling map positional error to infer about true feature location. **Topic contributed talk.** Joint Statistical Meetings, Aug 7-11, 2005, Minneapolis, MN. (with Alan E. Gelfand & John A. Silander, Jr.)
- 2004 Hierarchical spatial modeling for estimation of population size. **Invited talk.** Conference on New Developments of Statistical Analysis in Wildlife, Fisheries, and Ecological Research (The Fifth Winemiller Symposium), Oct 13-16, 2004, University of Missouri, Columbia, Missouri. (with Alan E. Gelfand)

- Hierarchical spatial modeling for estimation of population size. **Talk**. Montana, American Statistical Association Montana Chapter Meeting, Oct 12, 2004, Butte, MT. (with Alan E. Gelfand)
- Hierarchical spatial modeling for estimation of population size. **Topic contributed talk**. Joint Statistical Meetings, August 8-12, 2004, Toronto, Canada. (with Alan E. Gelfand)
- 2002 Modeling and prediction of nonstationary spatial environmental processes. **Invited talk**. Oklahoma State University Department of Statistics Seminar sponsored by Sigma Xi, November 1, 2002, Stillwater, OK. (with Montserrat Fuentes)
- Uncertainty in estimation, forecasting and decision: teaching students to think with uncertainty in mind. **Panel Discussant**. Ecological Society of America Meetings, August 4-9, 2002, Tucson, AZ.
- State space models for ecological time series. **Invited talk**. Uncertainty and Information in Ecological Forecasting Symposium. Ecological Society of America Meetings, August 4-9, 2002, Tucson, AZ. (with Michael Lavine)
- Spatial modeling of population size. **Contributed poster**. ISI International Conference on Environmental Statistics and Health, July 16 - 18, 2002, Santiago de Compostella, Spain. (with Alan E. Gelfand)
- 2001 Estimation and prediction for nonstationary atmospheric processes. **Contributed poster**. Joint Statistical Meetings, August 5-9, 2001, Atlanta, GA. (with Montserrat Fuentes)
- Distributional theory and modeling. Contributed Talk Session. **Session Chair**. Joint Statistical Meetings, General Methodology Section, August 5-9, 2001, Atlanta, GA.
- Estimation and prediction for nonstationary atmospheric processes. **Invited talk**. IMS Fifth North American New Researchers Conference, July 31 - August 3, 2001, Georgia Institute of Technology, Atlanta, GA. (with Montserrat Fuentes)
- 2000 Modeling and prediction of nonstationary spatial environmental processes. **Contributed talk**. Joint Statistical Meetings, August 13-17, 2000, Indianapolis, IN. (with Montserrat Fuentes)

## **COMMITTEES**

Wyoming NASA Space Grant Consortium Faculty Education Enhancement and Research Initiation Grant proposal review committee. (2009)

University of Wyoming College of Arts & Science Summer Independent Study Committee (Sept. 2007-May 2010)

University of Wyoming Research Advisory Committee (Sept. 2007-May 2010)

Montana State University Department of Mathematical Sciences Promotion and Tenure Committee (2004-06)

Committee to develop a proposal for the Masters of Science Program in Ecological & Environmental Statistics, Montana State University. Approved by the Montana Board of Regents of Higher Education, September 19, 2005.

## **STUDENT ADVISING/GRADUATE SUPERVISION**

### **GRADUATE STUDENTS:**

Current Graduate Committee Chairmanships (Wyoming):  
Darren Gemoets (PhD)  
Pritam Gupta (PhD)

Current Graduate Committee Memberships (excluding those chaired): 4 PhD

## **OTHER ACTIVITIES/ACCOMPLISHMENTS**

### **Visiting scholars/outstanding students sponsored**

Brenda Lynn Thompson. Statistics. U. Wyoming A&S Outstanding Graduate for 2008. Also, served as Brenda's Senior Thesis Project Advisor, Spring 2008 (with Dr. Kiona Ogle, UW Botany).