

## THOMAS R. BOUCHER

**Mailing Address:**

351 SE 7th  
Cooper  
TX 75432

**Contact Information:**

Office: 903.886.5947  
Cell: 603.715.4096  
[thomas.boucher@tamuc.edu](mailto:thomas.boucher@tamuc.edu)

**INTERESTS:** Nonlinear time series, Markov chains, applied probability and stochastic processes, ecological statistics/envirometrics, applied statistics/statistical consulting, online statistics education

### PROFESSIONAL EXPERIENCE

2012 – present	<b>Assistant Professor</b> , Department of Mathematics, Texas A&M University-Commerce
2009 – 2012	<b>Associate Professor</b> , Department of Mathematics, Plymouth State University
2005 – 2012	<b>Director, Statistical Consulting Center</b> , Department of Mathematics, Plymouth State University
2011 – 2012	<b>Wixson Endowed Professor</b> , Department of Mathematics, Plymouth State University
2005 – 2009	<b>Assistant Professor</b> , Department of Mathematics, Plymouth State University
2003 – 2005	<b>Postdoctoral Fellow</b> , Department of Statistics, Virginia Tech
1998 – 2003	<b>Teaching Assistant</b> , Department of Statistics, Texas A&M University
1999 – 2003	<b>Statistical Consultant</b> , USDA FSEP Program, Texas A&M University
2001	<b>Biostatistics Intern</b> , Quintiles, Kansas City
2000	<b>Research Intern</b> , IBM's T.J. Watson Research Institute
1995 – 1998	<b>Teaching Assistant</b> , and <b>Supplemental Instructor</b> , University of Massachusetts-Lowell, Department of Mathematics

### EDUCATION

**Ph.D. Statistics**, December 2003, Texas A&M University, College Station, TX.

Dissertation: "V-Uniform ergodicity of threshold autoregressive nonlinear time series".

**M.S., Mathematics** (summa cum laude), June 1998, University of Massachusetts-Lowell, MA.

**B.S., Mathematics** (summa cum laude), June 1996, University of Massachusetts-Lowell, MA.

### PUBLICATIONS - in print, press, or review

Baumann, A., Kahl, J.S., **Boucher, T.R.**, and McGuire, K. (2012), "Changes in Surface Water Chemistry in Maine High Elevation (HELM) Lakes in Response to the 1990 Clean Air Act Amendments".

Under review.

**Boucher, T.R.** (2012). "Boosting, downsizing and optimality of test functions of Markov chains". Under review.

Roache, D. R., **Boucher, T.R.**, and Collins, J. M. (2011), "Intraseasonal Change in ENSO Region Sea Surface Temperature Anomalies and Atlantic Tropical Cyclone Activity". Under review.

Walser, R. F., Meserve B., and **Boucher, T.R.** (2009). "The effectiveness of thoracic spine manipulation for the management of musculoskeletal conditions: a systematic review of randomized clinical trials". *Journal of Manual and Manipulative Therapy*, 7(14), 237-246.

**Boucher, T.R.** (2009). "A Hoeffding inequality for Markov chains using a generalized inverse". *Statistics & Probability Letters*, 79, Issue 8, No.15, 1105-1107

Meserve, B., Cleland, J., and **Boucher, T.R.**, (2009). "Assessing superior labral anterior posterior lesions". *The American Journal of Sports Medicine*, 37(11), 2252-8.

- Boucher, T.R.**, and Cline, D.B.H. (2009), “Piggybacking threshold processes with a finite state Markov chain”. *Stochastics and Dynamics*, Vol. 9, No. 2, 187-204.
- Meserve, B., Cleland, J., and **Boucher, T.R.**, (2008). “A meta-analysis examining clinical test utilities for assessing meniscal injury”. *Journal of Clinical Rehabilitation* **22**, No.2, 143-161.
- Contributor** to Cooley, J., Taylor, K., and H. Vogel (2008). “Summary of Loon Preservation Committee Field Activities in New Hampshire in 2007” and Cooley, J., Taylor, K., and H. Vogel (2007). “Summary of Loon Preservation Committee Field Activities in New Hampshire in 2006”. Loon Preservation Committee, Moultonborough, NH.
- Boucher, T.R.**, and Cline D.B.H., (2007). “Stability of cyclic threshold and threshold-like autoregressive time series models”. *Statistica Sinica* **17**, No.1, 43-62.
- Spitzner, D.J., and **Boucher, T.R.**, (2007). “Asymptotic variance of functionals of discrete-time Markov chains via the Drazin inverse”. *Electronic Communications in Probability* **12**, 120-133.

### **Reports/Conference Papers/Abstracts/Proceedings:**

- Van Gyzen, V.M., Pruyn, M.L., Votta, K., and **Boucher, T.R.** (2012). “Factors other than temperature may influence northern hardwood tree phenology”. *Ecological Society of America Annual Meeting*, Portland, Oregon.
- Fuller, S., **Boucher, T.R.**, and Callahan, C., (2011). “Habitat modeling for New England Cottontails”. *Wildlife Management Institute*.
- Jacques, A., Koermer, J.P., and **Boucher, T.R.** (2011). “Comparison of the United States Precision Lightning Network™ (USPLN™) and the Cloud-to-Ground Lightning Surveillance System (CGLSS-II)”. *AMS 91st Annual Meeting*, Seattle, January 2011.
- McCue, M.H., Koermer, J.P., Roeder, W.P., and **Boucher, T.R.** (2010). “Validation and Development of Existing and New RAOB Based Warm-Season Convective Wind Forecasting Tools for Kennedy Space Center and Cape Canaveral Air Force Station”. *14<sup>th</sup> AMS Conference on Aviation, Range, and Aerospace Meteorology (ARAM)*. Atlanta, January 2010.
- Rennie, J.J., Koermer, J.P., Roeder, W.P., and **Boucher, T.R.** (2010). “Evaluation of WSR-88D Methods to Predict Warm Season Convective Wind Events at the Kennedy Space Center And Cape Canaveral Air Force Station”. *14<sup>th</sup> AMS Conference on Aviation, Range, and Aerospace Meteorology (ARAM)*. Atlanta, January 2010.
- Pingree, K.A., Doner, L.A., Morrill, C. and **Boucher, T.R.** (2009). “CCSM3’s Representation of the South Bipolar Seesaw during Heinrich Event 2”. Technical Report.
- Boucher, T.R.**, (2008). “An analysis of the New Hampshire common loon population counts using information-theoretic criteria”. Technical report, *Loon Preservation Committee*.
- Meserve, B., Cleland, J., and **Boucher, T.R.**, (2007). “Assessing meniscal injury: what works?”. *APTA-CSM 2007 Proceedings*.
- Boucher, T.R.**, (2006). “A simple correction for long memory in ecological experiments”. Technical report.
- Boucher, T.R.**, (2005). “Implications of exponentially boosting test functions of V- Uniformly ergodic Markov chains”. *Virginia Journal of Science VAS Proceedings*.
- Boucher, T.R.**, (2004). “Stability of TAR models”. *JSM 2004 Proceedings*
- Boucher, T.R.**, (2003). “V-Uniform ergodicity of threshold autoregressive nonlinear time series”. Texas A&M University, College Station, TX.

### **In Preparation:**

- Boucher, T. R.**, “Computational Techniques for Markov Chains using a Generalized Inverse”.
- Boucher, T.R.**, “Estimating the Embedding Dimension of General State Markov Chains”.
- Walser, R. F., Meserve B., and **Boucher, T.R.**, “Outcomes of ACL Reconstructive Surgery”

## *T. Boucher - Curriculum Vitae*

- Anderson, B., Koermer, J.P., Roeder, W.P., and **Boucher, T.R.** “Applying Machine Learning Techniques to Develop RAOB Based Warm-Season Convective Wind Forecasting Tools”.
- King, M. **Boucher, T.R.**, Hammond, P., and Jones, F., “Assessing Reliability of Translation of Center of Force Using a Portable Pressure Mapping Device”.
- Richards, R., **Boucher, T.R.**, *Untitled*.
- Cooley, J., **Boucher, T.R.** “Integrated Modeling of the New Hampshire Loon Population”.

### **Book Reviews:**

- Boucher, T.R.**, (2012). Review of “Statistics for spatio-temporal data” by Noel Cressie and Christopher K. Wikle. *Mathematical Reviews*.
- Boucher, T.R.**, (2011). Review of “Probabilistic Graphical Models” by Daphne Koller and Nir Friedman. *Mathematical Reviews*.
- Boucher, T.R.**, (2007). Review of “Test Equating, Scaling, and Linking: Methods and Practices (2nd edition)” by Michael J. Kolen and Robert L. Brennan. *Journal of the American Statistical Association*, Vol. 102, No. 478, pp.762-763.

### **GRANT/CONTRACT CONSULTING ACTIVITY**

- Funding awarded to attend 2011 Annual Meeting of the New Hampshire IDeA Network of Biomedical Research Excellence (NH-INBRE), August 1-2, 2011, Whitefield NH.
- “Refinement of a Habitat Model for New England Cottontails”. Funded for \$1400 by the Wildlife Management Institute. June 2011.
- Plymouth State University - Atmospheric Science and Chemistry. Funded for \$4000 through US DOC, Department of Commerce, NOAA grant to the New England Weather Technology and Research Initiative (NEWTRI). Purpose: to mentor summer research experiences of graduate students in meteorology. 6/1/11-9/1/11.
- "Identifying and Determining the Impact of Factors Affecting the Risk of Falling Among Middle-to-Older Adults ". Funded for \$643 through Provost's Faculty Research Funds, Plymouth State University, 7/1/11 – 6/30/12.
- Plymouth State University - Atmospheric Science and Chemistry. Funded for \$3750 through US DOC, Department of Commerce, NOAA grant to the New England Weather Technology and Research Initiative (NEWTRI). 6/1/2010-9/1/2010.
- “Development of a Habitat Model for New England Cottontails”. Funded for \$2500.00 by New Hampshire Fish & Game through federal grant to State Wildlife Program Cooperative Cottontail Management. 9/2009 – 6/2010.
- “Plymouth State University Department of Mathematics’ Statistical Consulting Center’s Environmetrics Initiative”. Funded for \$1000.00 by PSU Center for the Environment, 7/1/2006 – 7/1/2007.

### **PRESENTATIONS**

- “(Some) Machine Learning from a Statistical Perspective”. **Boucher, T.R.**. Texas A&M – Commerce, Commerce TX, November 2012
- “Undergraduate Research – Evaluating Falls Risk in Elderly Subjects”. **Boucher, T.R.** and Jones, F.. Texas A&M – Commerce, Commerce TX, April 2012
- “A Two-Stage RAOB Based Warm-Season Convective Wind Forecasting Tool.” Anderson, B., Koermer, J.P., Roeder, W.P., and **Boucher, T.R.**. *American Meteorological Society Annual Meeting*, New Orleans, January 2012.
- “Reliability of Translation of Center of Force Using Portable Pressure Mapping Device in Older Adults.” King, M.A., Trombulak, M.E., Eissler, W.L., Kempson, R.S., **Boucher, T. R.**, Boucher, J.P., *American College of Sports Medicine 59<sup>th</sup> Annual Meeting*, San Francisco, CA, May 2012

## *T. Boucher - Curriculum Vitae*

- “Spatial Data with R.” **Boucher, T.R.** *NH Arc Users Group*, April 2011.
- “Combining Falls-Risk Measures.” Kempson, R., **Boucher, T.R.**, King, M., and McCahan, B. *Plymouth State University Celebration of Excellence Day*, April 2011.
- “Modeling of New Hampshire Loon Population Counts.” Lasell, I. and **Boucher, T.R.** *Plymouth State University Celebration of Excellence Day*, April 2011. Also *2011 Annual Meeting of the New Hampshire IDeA Network of Biomedical Research Excellence (NH-INBRE)*, August 1-2, 2011, Whitefield NH.
- “Comparison of the United States Precision Lightning Network™ (USPLN™) and the Cloud-to-Ground Lightning Surveillance System (CGLSS).” Alexander Jacques, James. P. Koermer, William P. Roeder, and **Boucher, T.R.** *AMS 91st Annual Meeting*, Seattle, January 2011.
- “Validation and Development of Existing and New RAOB Based Warm-Season Convective Wind Forecasting Tools for Kennedy Space Center and Cape Canaveral Air Force Station.” Mitchell H. McCue, James. P. Koermer, William P. Roeder, and **Boucher, T.R.** *ARAM*, Atlanta, January 2010.
- “Evaluation of WSR-88D Methods to Predict Warm Season Convective Wind Events at the Kennedy Space Center And Cape Canaveral Air Force Station.” James J. Rennie, James. P. Koermer, **Boucher, T.R.**, and William P. Roeder, *ARAM*, Atlanta, January 2010.
- “Seasonal Change in ENSO Region Sea Surface Temperature Anomalies and Atlantic Tropical Cyclone Activity.” David Roache and **Boucher, T.R.** *SEDAAG*, Knoxville, TN, November 2009.
- “A Workshop on CART techniques within the R environment.” **Boucher, T.R.**, New Hampshire Fish & Game, Concord, NH, September 2009.
- “Analysis of the CCSM3’s Representation of Heinrich Event 2’s Southern Hemispheric Bipolar Seesaw.” Pingree, K., Doner, L., **Boucher, T.R.**, *MOCA-09*, Montreal, July 2009.
- “An Analysis of US Landfalling Hurricanes.” **Boucher, T.R.**, *PSU Meteorology Seminar*, Plymouth, NH, November 2008.
- “Observations on the New Hampshire Loon Population.” **Boucher, T.R.** *NELSWG*, Moultonborough, NH, April 2008
- “A Meta-Analysis Examining Clinical Test Utility for Assessing Meniscal Injury.” Meserve, B., Cleland, J., **Boucher, T.R.** *APTA-CSM 2007*. February 2007, Boston.
- “Beware False Trends.” **Boucher, T.R.** *PSU Mathematics Colloquium*, Plymouth, NH, December 2006.

## **SUPERVISED GRADUATE AND UNDERGRADUATE RESEARCH**

- Crowell, Marguerite (2012). “A Climate of Change: The Need for Water Resource Education in Pakistan to Meet Current and Upcoming Challenges”. NH Water and Watershed Conference.
- Desrosiers, Andrew (Spring 2012). “Developing a Wind Damage Actuarial Model.”
- Lasell, Ian (Spring 2012). “Evaluating Imputation Schemes.”
- Jones, Felicia (Fall 2011 – Spring 2012). “Determining the Intraclass Correlations of MatScan Observations on Elderly Subjects.”
- Andersen, Bonnie (Summer/Fall 2011). “Applying Machine Learning Techniques to develop RAOB Based Warm-Season Convective Wind Forecasting Tools.”
- Jones, Felicia (Spring 2011). “Student Achievement in Mathematics Courses with an Eye Towards Retention.”
- Kempson, Ryan (Spring 2011). “Factor Analysis of MatScan Balance Measures.”
- Lasell, Ian (Spring 2011). “Viability Analysis of the New Hampshire Loon Population.”
- Pingree, Katherine (Spring 2008). “Analysis of the CCSM3’s Representation of Heinrich Event 2’s Southern Hemispheric Bipolar Seesaw.” Capstone project.
- Reczko, Katie (Spring 2008), “Using the Parametric Bootstrap in Likelihood Ratio Tests of Nested Population Models.”
- Lassen, Stephanie (Spring 2007), “How are the Actuarial Exams Graded?”

## **CONSULTING/COMMITTEES – Faculty and Graduate Research**

- Christ, J. (2012). “Winter Climate Change and the Northern Hardwood Forest”. M.S. thesis, Biology, Plymouth State University.
- Comeau, N. (2012), “Evaluation of Aversive Conditioning on Nuisance Activity Levels of Black Bear Using Low Cost GPS Telemetry Collars”. MS thesis, Plymouth State University, College of Graduate Studies, Environmental Science and Policy.
- Crowell, M. (2012). M.S. thesis, Environmental Science & Policy, Plymouth State University.
- Fessenden, R. (2012). M.S. thesis, Applied Meteorology, Plymouth State University.
- Henningsen, B. (2012). M.S. thesis, Biology, Plymouth State University.
- Palmer, M. (2012). “Predicting cloud ceiling height for the Mount Washington Auto Road and Cog Railway”. M.S. thesis, Applied Meteorology, Plymouth State University.
- Ramberg-Pihl, N. (2012). “Habitat preferences of northern crayfish”. M.S. thesis, Biology, Plymouth State University.
- Van Gyzen, J. (2012). “How does climate affect the phenology of northern hardwood forests?”. M.S. thesis, Environmental Science & Policy, Plymouth State University.
- Andersen, B. (2011). “Applying Machine Learning Techniques to develop RAOB Based Warm-Season Convective Wind Forecasting Tools”. M.S. thesis, Applied Meteorology, Plymouth State University.
- Baumann, Adam (2011). “Assessing the effectiveness of federal acid rain policy using remote and high elevation lakes in northern New England”. MS thesis, Plymouth State University, College of Graduate Studies, Environmental Science and Policy.
- Jacques, A. (2011). “Comparison of the United States Precision Lightning Network™ (USPLN™) and the Cloud-to-Ground Lightning Surveillance System (CGLSS)”. M.S. thesis, Applied Meteorology, Plymouth State University.
- Terborg, A. (2011). “Forecasting Low-level Icing in Complex Terrain: A Non-model Approach”. M.S. thesis, Applied Meteorology, Plymouth State University.
- Votta, K. (2011). “Establishing baseline phenology patterns for northern hardwood trees along an elevation gradient”. MS thesis, Environmental Science and Policy, Plymouth State University.
- Bradbury, C. (2010). “The Prosper Credit Risk Rating System: Does it Improve Market Decision Making Efficacy?”. International Atlantic Economics Society, Charleston SC.
- Callahan, K. (2010), “Estimating Fine-Scale Movement Patterns of Black Bear using GPS Telemetry”. MS thesis, Plymouth State University, College of Graduate Studies, Environmental Science and Policy.
- Kelly, Regina (2010). “Brief Mindfulness Meditation and Its Effect on One’s Happiness”. Doctoral dissertation, San Diego University for Integrative Studies.
- McCue, M. (2010). “Validation and Development of Existing and New RAOB Based Warm-Season Convective Wind Forecasting Tools for Kennedy Space Center and Cape Canaveral Air Force Station”, M.S. thesis, Applied Meteorology, Plymouth State University.
- Rennie, J. (2010). “Evaluation of WSR-88D Methods to Predict Warm Season Convective Wind Events at the Kennedy Space Center And Cape Canaveral Air Force Station”. M.S. thesis, Applied Meteorology, Plymouth State University.
- Conrod, Chris (2008), “Rodent Population and Habitat Dynamics in a Northern Hardwood Forest”. MS thesis, Plymouth State University, College of Graduate Studies, Biological Sciences.
- Conrod, Chris (2008), “Habitat selection of the woodland jumping mouse (*Napaeozapus insignis*) in a northern hardwood forest: cover density or water proximity?”. In preparation.
- Roache, David (2008) "The Impact of Discrete Phases of ENSO Neutral Conditions on Atlantic Tropical Cyclone Activity". MS thesis, Plymouth State University, College of Graduate Studies, Meteorology.

## *T. Boucher - Curriculum Vitae*

- Garner, Greg (2007), "New Hampshire air quality forecasting: the development and interpretation of classification and regression tree models". MS thesis, Plymouth State University, College of Graduate Studies, Meteorology.
- Loconto, Andrew (2006), "Improvements of warm-season convective wind forecasts at the Kennedy Space Center and Cape Canaveral Air Force station", MS thesis, Plymouth State University, College of Graduate Studies, Meteorology.

### **REVIEWING/REFEREEING**

Journal of the American Statistical Association  
Statistics and Probability Letters  
Mathematical Reviews  
Psychometrika  
Communications in Statistics – Theory and Methods  
Far East Journal of Mathematical Sciences  
John Wiley & Sons, Inc  
Nature Panel Reader 2010

### **SERVICE AND OUTREACH**

Director, PSU Statistical Consulting Center, 2005 - present  
Associate, PSU Math NH Impact Center, 2010 - present  
Reader Panel, *Nature*, 2010 – 2011  
PSU Atmospheric Sciences Promotion and Tenure Committee 2010-2011  
PSU Environmental Science and Policy Search Committee 2010-2011  
PSU Math Promotion and Tenure Committee (Chair) 2009-2010, 2010-2011  
PSU Math Search Committee 2010-2011  
PSU Math Assessment Committee  
PSU Math Strategic Planning 2009-2010  
PSU Academic Integrity Committee 2008 – 2009  
PSU Math Technological Advisory Committee 2006 - 2007  
*MathCounts* 2006 and 2007 competition committees  
PSU Math Department Review Committee  
PSU Math Strategic Planning Committee  
Loon Preservation Center Technical Committee

### **AWARDS AND HONORS**

Edward and Marilyn Wixson Endowed Professor (2011 – 2012)  
Nominee, Edward and Marilyn Wixson Endowed Professor (2007)  
Dean's Scholar, Texas A&M University  
Merit Fellowship, Texas A&M University  
Graduate Enhancement Fellowship, Texas A&M University  
Mathematics Achievement Award, University of Massachusetts-Lowell

### **PROFESSIONAL MEMBERSHIPS**

International Statistics Institute  
The International Environmetrics Society

## **TECHNICAL SKILLS**

Platforms: Windows, UNIX/Linux

Software: R, Minitab, StatCrunch, MATLAB, SAS, S+, SPSS, some familiarity with Weka, WinBUGS, ArcGIS

Languages: C, some familiarity with Python, C++, Perl, Fortran

Publishing: TeX, LaTeX, Word, Powerpoint, HTML

Learning Management Systems: Moodle 2, Moodle, Blackboard, WebCT

## **REFERENCES**

William J. Roberts, Professor and Chair  
Department of Mathematics  
Plymouth State University  
Plymouth, NH 03264-1595  
603.535.2233

James P. Koermer, Professor  
Atmospheric Sciences and Chemistry  
Plymouth State University  
Plymouth, NH 03264-1595  
603.535.2574

Larry Blaine, Professor  
Department of Mathematics  
Plymouth State University  
Plymouth, NH 03264-1595  
603.535.2506

Brian Eisenhauer, Director and Associate Prof.  
Center for the Environment  
Plymouth State University  
Plymouth, NH 03264-1595  
603.535.2497

John Cooley, Staff Biologist  
Loon Preservation Committee  
Lee's Mill Road, PO Box 604  
Moultonborough, NH 03254  
603.476.5666