

John M. Zobitz

- CONTACT INFORMATION** Department of Mathematics *Office:* (801) 585-1637
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Salt Lake City, UT 84112-0090 USA *Internet:* www.math.utah.edu/~zobitz
- RESEARCH INTERESTS** Ecosystem ecology, Bayesian parameter estimation, statistical methods for large datasets, process-based modeling of carbon fluxes using stochastic and deterministic models.
- EDUCATION** **University of Utah**, Salt Lake City, Utah USA
Ph.D., Applied Mathematics, Expected May 2007
Focus: Mathematical Biology
Advisors: Dr. Frederick R. Adler (Mathematics) & Dr. David R. Bowling (Biology)
- University of Utah**, Salt Lake City, Utah USA
M.A., Applied Mathematics, May 2004
Focus: Mathematical Biology
Advisor: Dr. Frederick R. Adler
- Saint John's University**, Collegeville, Minnesota USA
B.A., Mathematics and Spanish (Summa cum laude), May 2002
Minor: Physics
- Research Experience for Undergraduates**, Pullman, Washington USA
May-July 2000
Topic: Mathematical Biology
Advisor: Dr. V. S. Manoranjan
- HONORS, AWARDS AND SCHOLARSHIPS**
- 2005-present: Department of Energy Graduate Research Environmental Fellowship (\$19200 annual stipend)
 - 2002-2005: NSF Integrative Graduate Education and Research Traineeship (IGERT) Fellow (\$20400 annual stipend)
 - 2001 Barry M. Goldwater Scholarship Recipient (\$7500)
 - University of Utah Graduate Research Travel Grant (2003, 2004, 2005, ~\$700 conference funding each year)
 - Biosphere Atmosphere Stable Isotope Network Workshop Travel Grant (September 2004, funding to attend workshop)
 - Biosphere Atmosphere Stable Isotope Network Workshop Travel Grant (December 2005, funding to attend American Geophysical Union Fall Meeting)
 - 2002 NSF Graduate Fellowship Honorable Mention
 - St. John's University Dean's List, 1998-2002

PUBLICATIONS

1. J.M. Zobitz, "Pascal Matrices and Differential Equations," 2003. *Pi Mu Epsilon Journal*, Vol. 11(8): 437-444.
2. J. M. Zobitz, J. P. Keener, H. Schnyder, D. R. Bowling, "Sensitivity analysis and quantification of uncertainty for isotopic mixing relationships in carbon cycle research," 2006. *Agricultural and Forest Meteorology*, 136:56-75, doi:10.1016/j.agrformet.2006.01.003.
3. D. Pataki, D.R. Bowling, J.R. Ehleringer, J. M. Zobitz, "High resolution atmospheric monitoring of urban CO₂ sources," 2006. *Geophysical Research Letters*, 33, L03813, doi:10.1029/2005GL024822.
4. J. M. Zobitz, S. P. Burns, J. Ogée, M. Reichstein, D. R. Bowling, "Partitioning net ecosystem exchange of CO₂: Comparison of an isotope approach to environmental regression methods," *In review at Journal of Geophysical Research-Biogeosciences*.
5. J. M. Zobitz, S. P. Burns, M. Reichstein, D. R. Bowling, "An analysis of the isotopic disequilibrium between whole-ecosystem photosynthesis and respiration fluxes in a subalpine forest," *In final preparation for submission to Global Change Biology*.

TEACHING
EXPERIENCE

University of Utah, Salt Lake City, Utah USA

Department of Mathematics

Instructor

August 2004 - May 2005

Math 1100: Quantitative Analysis (Fall 2004)

Math 2270: Linear Algebra (Spring 2005)

- Primary lecturer for course with 30 enrolled students.
- Implemented pre-approved curricula and designed syllabus and lectures.
- Developed additional curricula and project applications for students.
- Graded homework and exams, administered final grades.
- Assisted in the Mathematics department tutoring center.

Saint John's University, Collegeville, Minnesota USA

Department of Mathematics

Teaching Assistant

Fall 2000, Fall 2001-Spring 2002

Calculus I (Fall 2000, Fall 2001)

Calculus II (Spring 2002)

- Taught undergraduate calculus lab sections.
- Grade and correct homework.
- Assisted in the Mathematics department tutoring center.

Escuela de Pijije, Bagaces, Guanacaste, Costa Rica

Department of Mathematics

Teaching Intern

Spring 2001

- Taught mathematics and English to 4th-6th grade students in a rural school.
- Instruction was done entirely in Spanish.

ACADEMIC AND
PROFESSIONAL
EXPERIENCE

University of Utah, Salt Lake City, Utah USA

Department of Mathematics

Graduate Student

August 2002 - present

Researching the application of mathematical models to the carbon cycle in order to determine diurnal patterns of ecosystem-scale photosynthesis and respiration patterns at a high-elevation coniferous forest west of Boulder, Colorado.

Advisors: Dr. Frederick Adler (Mathematics) and Dr. David R. Bowling (Biology)

Institut National de la Recherche Agronomique, Bordeaux, France

Research Assistant

May - July 2004

Collaborated to quantify and describe error propagation for ecosystem-scale photosynthetic and respiratory fluxes of CO₂.

Advisor: Dr. Jerome Ogée

University of Utah, Salt Lake City, Utah USA

Biology Department, Bowling Laboratory

Research Assistant

June - August 2003

Developed and implemented a model for carbon dioxide gas fluctuations in the soil and assisted with field measurements at a field site near Canyonlands National Park.

Advisor: Dr. David R. Bowling

Saint John's University, Collegeville, Minnesota USA

Department of Physics

Research Assistant

June - September 1999, June - September 2000

Assisted in development of improved radon gas detector used in experimental research, conducted a quality control/quality assurance review of experimental data set, and developed a turbulent particle deposition model of retrospective radon detector (RRD) chips.

Advisor: Dr. Daniel Steck

PRESENTATIONS

Presented talk: *Solving a Mathematical Representation of the Allee Effect: My Summer with a Differential Equation*, November 2000

Pi Mu Epsilon Regional Conference

Saint Norbert's College, De Pere, Wisconsin USA

Presented talk: *Matrices and Particular Solutions to Differential Equations: Towards a More Concise Method*, April 2002

Pi Mu Epsilon Regional Conference

Saint John's University, Collegeville, Minnesota USA

Invited talk: *Pascal Matrices and Differential Equations*, October 22, 2002

Mathematics Department Graduate Colloquium

University of Utah, Salt Lake City, Utah USA

Invited talk: *Pascal Matrices and Differential Equations*, November 26, 2002

Mathematics Department Undergraduate Colloquium

University of Utah, Salt Lake City, Utah USA

Presented poster: *Process Based Carbon Dioxide Modeling in a Desert Ecosystem*, December 11, 2003

American Geophysical Union Fall Meeting
San Francisco, California, USA

Invited talk: *Time Out for Delay Equations*, February 10, 2004

Mathematics Department Graduate Colloquium
University of Utah, Salt Lake City, Utah USA

Presented poster: *Analysis of Linear Regression Techniques to Determine $\delta^{18}\text{O}_R$ and $\delta^{13}\text{C}_R$: Implications and Applications*, September 20, 2004

Biosphere Atmosphere Stable Isotope Network workshop "Oxygen isotopes as a tracer linking global O_2 , CO_2 , and H_2O Cycles"
Point Reyes, California, USA

Invited talk: *Challenges and perspectives on partitioning net ecosystem exchange in heterogeneous forests*, October 2004

Biology Department Graduate Seminar
University of Utah, Salt Lake City, Utah USA

Presented poster: *Sensitivity Analysis and Quantification of Uncertainty for Isotopic Mixing Relationships in Carbon Cycle Research*, December 14, 2004

American Geophysical Union Fall Meeting
San Francisco, California, USA

Invited talk: *Using mathematical inverse theory to estimate respiratory and photosynthetic fluxes in a heterogeneous conifer canopy*, May 13, 2005

Utah-Arizona IGERT Biomathematics Summit
University of Utah, Salt Lake City, Utah USA

Presented poster: *Estimating respiratory and photosynthetic fluxes in a heterogeneous conifer forest*, May 19, 2005

NSF IGERT Project Meeting
Washington D.C., USA

Invited talk: *Comparison and Assessment of Methods to Partition Net Ecosystem Exchange of CO_2 in Heterogeneous Environments*, August 22, 2005

Global Change Education Program End-of-Summer Workshop
Washington D.C., USA

Invited talk: *Consistent Linear Regression*, November 1, 2005

Mathematics Department Graduate Colloquium

Presented talk: *High-resolution stable-isotope partitioning of net ecosystem exchange into respiration and photosynthesis*, December 5, 2005

American Geophysical Union Fall Meeting
San Francisco, California, USA

Invited talk: *High resolution atmospheric monitoring of urban carbon dioxide sources*, June 15, 2006

Global Change Education Program Summer Orientation Workshop
Portland, Oregon USA

Invited talk: *Heterogeneous soil substrate modeling in a high-elevation subalpine forest*, October 16, 2006

Institut National de la Recherche Agronomique (INRA)
Bordeaux, France

Session co-organizer: *Using Stable Isotopes to Quantify Terrestrial Carbon Cycle Processes at Multiple Spatial and Temporal Scales*, December, 2006

American Geophysical Union Fall Meeting
San Francisco, California, USA

Invited talk: *Linking ecosystem uptake and release of carbon to mesophyll conductance*, January 26, 2007

Biology Department Graduate Colloquium
University of Utah, Salt Lake City, Utah USA

Invited talk: *Mathematical estimation of whole-forest uptake and release of carbon*, February 5, 2007

Mathematics Department Colloquium
Augsburg College, Minneapolis, MN USA

Invited talk: *Evaluation and analysis of partitioning ecosystem CO₂ fluxes with stable carbon isotopes*, February 13, 2007

Department of Earth System Science Colloquium
University of California-Irvine, Irvine, CA USA

CONFERENCES
ATTENDED

Pi Mu Epsilon Regional Conference, November 2000
Saint Norbert's College, De Pere, Wisconsin USA

Pi Mu Epsilon Regional Conference, April 2002
Saint John's University, Collegeville, Minnesota USA

TA Training for new graduation students, August 2002

Presented by University of Utah Department of Mathematics and Center for Teaching and Learning Excellence
University of Utah, Salt Lake City, Utah USA

Infectious Disease Mathematical Modeling and Epidemiology, April 2003

Presented by University of Utah and Harvard School of Public Health
University of Utah, Salt Lake City, Utah USA

American Geophysical Union Fall Meeting, December 9-12, 2003

San Francisco, California USA

Utah-Arizona IGERT Biomathematics Summit, May 14-16, 2004
University of Arizona, Tucson, Arizona USA

Biosphere-Atmosphere Stable Isotope Network workshop: “Oxygen isotopes as a tracer linking global O₂, CO₂, and H₂O Cycles”, September 19-22, 2004
Point Reyes, California, USA

American Geophysical Union Fall Meeting, December 15-17, 2004
San Francisco, California USA

Utah-Arizona IGERT Biomathematics Summit, May 13-15, 2005
University of Utah, Salt Lake City, Utah USA

2005 NSF IGERT Project Meeting, May 18-20, 2005
Washington D.C. USA

Utah Mathematical Biology IGERT Student Workshop, June 17-19, 2005
University of Utah, Salt Lake City, Utah USA

Global Change Education Program End-of-Summer Workshop, August 21-24, 2005
Washington D.C., USA

Fluxnet Science Team Meeting, October 18-20, 2005
Boulder, Colorado USA

American Geophysical Union Fall Meeting, December 5-8, 2005
San Francisco, California USA

Global Change Education Summer Orientation Workshop, June 13-17, 2006
Portland, Oregon USA

Global Change Education Program End-of-Summer Workshop, August 20-23, 2006
Washington D.C., USA

American Geophysical Union Fall Meeting, December 11-15, 2006
San Francisco, California USA

COMPUTER SKILLS Programming Languages: Matlab, Java
 Mathematical Packages: Maple, Mathematica
 Statistical Programming and Packages: R
 Applications: \LaTeX , Microsoft Office
 Operating Systems: Unix/Linux, Windows

PROFESSIONAL Society for Physics Students, 1999-2000
MEMBERSHIPS Pi Mu Epsilon Mathematical Society, 2001-present
 American Mathematical Society, 2001-present
 Society for Industrial and Applied Mathematics (SIAM), 2005-present

American Geophysical Union, 2003-present

MANUSCRIPT Journal of Geophysical Research-Biogeosciences; Plant, Cell, and Environment; Journal of the
REVIEWS Franklin Institute; Isotopes in Environmental and Health Studies;

OTHER ACTIVITIES Volunteer Assistant at YWCA in Salt Lake City (October 2003-April 2004)
University of Utah Mathematics Graduate Student Advisory Committee (GSAC) - Colloquium
Organizer (August 2003-May 2004)
University of Utah Mathematics Graduate Student Advisory Committee (GSAC) - Co-chair (Au-
gust 2004-May 2006)
Utah Mathematical Biology IGERT Student Workshop - Co-organizer (June 17-19, 2005)
University of Utah College of Science Academic Appeals and Academic Misconduct Committee
Member (September 2004-July 2006)