Jeffrey A. Nichols
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Education and Training

2008 University of Tennessee-Knoxville, Mathematical Ecology, PhD

1990 University of Alabama-Birmingham, Mathematics with a minor in Physics (summa cum laude), BS

Research and Professional Experience

2008-Present Post-Doctoral Research Associate. Environmental Sciences Division, Oak Ridge National Laboratory. Research mentor is Dr. Wilfred "Mac" Post. Applying computational, digital media, and data analysis techniques to parallel computation of climate, carbon-cycle, and soil models.

Projects:

1) *Climate Change Program* – Forcing SFA. Advisors: Peter Thornton and Mac Post. Recent work has been on development and analysis of CCSM/CLM-CN Point Mode models for calibration from site-level data.

2) *IMPACTS* – Sudden Arctic region vegetation/albedo change. Advisor: Mac Post. Utilizing point-mode CLM and global CCSM to investigate potential trigger points and positive feedbacks for rapid climate change.

3) *Great Lakes Bioenergy Research Center* – Optimizing biodiversity and bioenergy crops. Advisors: Tris West, Cesar Izzaraulde (PNNL), and Mac Post. Calculating, storing, and delivering 56m-level EPIC simulation data for states and regions. Consumers of the data include economists, life-cycle analysts, and biodiversity experts for evaluating bioenergy scenarios.

2008 Short-term, Post-doctoral Research. University of Tennessee. Expanding dissertation research to agent-based models of Mexican free-tailed bat populations. Utilizing parallel computing, media- and web-technology experience to compile an archive of quarter million NEXRAD radar images from the south-central Texas region as a tool for use by bat population experts. Delivered video and Google Earth-based solutions used to confirm and reinforce hypotheses about bat behavior. Have continued research assistance for investigations into causes, spread, and mitigation of white-nose syndrome (WNS) that is currently decimating cave bat populations throughout the Appalachian chain.

1999-2006 Principal Researcher. Digital Media Technologies, Jewelry Television. Jewelry Television is a rapidly growing, $500M+ cable, satellite, and Internet retailer headquartered in Knoxville. Core-member of "Skunkworks" group given free-reign to seek out and solve information and digital asset management problems. Research enabled core business analysis and fundamental improvements to how JTV evaluated, purchased, and presented product and did business. Developed in-house system that presented the second-by-second heartbeat of each of the core business functions of the company. Consultant to JTV for two years prior to being selected as IT Director.

Publications

1. X. Zhang, R.C. Izaurralde, D. Manowitz, T.O. West, W.M. Post, A.M. Thomson, V.P. Bandaru, J. Nichols, and J.R. Williams (2010). An Integrative Modeling Framework to Evaluate the Productivity and Sustainability of Biofuel Crop Production Systems. Submitted, Special Bioenergy issue of Global Change Biology.

2. Nichols, J. A., Hallam, T. G., and Dimitrov, D. T. (2008). Parallel Simulation of Ecological Structured Communities: Computational needs, hardware capabilities, and nonlinear applications. Nonlinear Analysis: Theory, Methods, and Applications. 69(3):832-842.
3. Ramachandramurthi, S., Hallam, T. G., and Nichols, J. A. (1997). Parallel simulation of individual-based, physiologically structured population models. Mathematical and Computer Modelling, 25(12):55–70.

Presentations and Meetings:

1. Invited Auditor of Annual CCSM4/CESM Tutorial Sessions, NCAR, July 2010.
2. CCSM Annual Meetings, Breckenridge, July 2010.
3. Poster "Region-wise Assembly of High-Resolution EPIC Simulations Using High-Performance Computation", GLBRC (Great Lakes Bioenergy Research Center) Annual Retreat, South Bend, IN, May 2010.
4. Fish and Wildlife Service, White-Nose Syndrome in Bat Populations Workshop, Pittsburgh, May 2010.
5. CCSM Land Model and Biogeochemistry Working Group Meetings, NCAR, February 2010.
6. GLBRC - Great Lakes Bioenergy Research Center - Science Retreat, Kellogg Biological Research Station, Michigan, February 2010.
7. AGU Meeting, Fall 2009. "Modeling the Net Ecosystem Carbon Balance and Net Ecosystem Exchange of Agroecosystems of the Mid-Continent Intensive Campaign Region during 2000-2008" Izaurralde, R C, Zhang, X, Post, W M, Thomson, A M, West, T O, Williams, J R, Manowitz, D, Nichols, J, Bandaru, V, Doraiswamy, P C
8. GLBRC - Great Lakes Bioenergy Research Center - Science Retreat, "Approaches for high resolution land use and bioenergy modeling," W.M. Post, J.A. Nichols, T.O. West, V.P. Bandaru, R.C. Izaurralde, D. Manowitz, and A. Thomson. June 2009, South Bend, IN

Graduate and Postdoctoral Advisors

PhD Advisor: Dr. Tom Hallam (University of Tennessee, Mathematics and Ecology)