

RECOMMENDATION OF DISSERTATION COMMITTEE

Initial committee

Revised committee

To: Dean of the Graduate College

From: Regents Professor, Department of Biological Sciences, Thomas G. Whitham

Re: Recommended Dissertation Committee Members

Please use this form to recommend a new dissertation committee or to recommend a change in membership of an approved committee. This form should be submitted for approval before the prospectus hearing.

Instructions:

1. The dissertation chair is responsible for completing this form.
2. If the outside member of the dissertation committee is not a member of the NAU faculty, please attach to this form the individual's vita or resume.
3. Attach a 2-3 paragraph summary of the proposed dissertation topic.
4. Submit completed form to department chair or graduate coordinator for approval.
5. Approved original must be submitted to the Graduate College.
6. The Graduate Dean will send a letter to each member of the committee acknowledging their participation.

Student Name: Matthew K. Lau

Student Program: PhD Biology

Dissertation Title or Topic: Evolution of Ecological Networks

Dissertation Chair: Thomas G. Whitham

Expertise related to dissertation: Community Genetics

Committee Member: Steven M. Shuster

Expertise related to dissertation: Quantitative Genetics

Committee Member: Matthew A. Bowker

Expertise related to dissertation: Statistical Modeling and Community Analyses

Committee Member (outside department): Stuart R. Borrett

Expertise related to dissertation: Network Ecology

Committee Member (additional; optional):

Expertise related to dissertation:



Please check to confirm:

Potential conflicts of interest have been addressed (e.g. committee members who stand to gain from specific results of the study or who may be relatives, friends, employers or peers of the student). If an unavoidable conflict is identified, continued participation by the committee member requires approval of the committee chair and a written plan to manage the conflict must be submitted to the Graduate College (for full policy, see <https://policy.nau.edu/policy/policy.aspx?num=200106>).

Dissertation Chair Signature: Thomas G. Whitham Date: Feb 7, 2014
Department Chair Signature: Steven G. Hempel Date: Feb. 7, 2014
Graduate College Approval: _____ Date: _____

Stuart R. Borrett

Assistant Professor of Biology and Marine Biology, University of North Carolina Wilmington, Wilmington, NC 28403
email: borretts@uncw.edu work: 910.962.2411 fax: 910.962.4066 web: <http://people.uncw.edu/borretts>

RESEARCH INTERESTS

- Systems ecology
- Ecological modeling, simulation, & analysis
- Network science
- Indirect effects
- Ecological informatics
- Coupled Human-Natural Systems

EDUCATION

2005 **Doctor of Philosophy**, University of Georgia, Athens, GA

Dissertation: *Ecosystem organization and transformation: The role of network architecture in the development of indirect effects.* Advisor: Dr. Bernard C. Patten

1997 **Bachelor of Arts**, Austin College, Sherman, TX
Biology Department, Center for Environmental Studies

EXPERIENCE

Associate Professor (Quantitative Ecologist) July 2013-2013. Department of Biology and Marine Biology, University of North Carolina Wilmington.

Visiting Research Fellow. Spring 2013. Duke Network Analysis Center, Social Science Research Institute, Duke University, Durham, NC.

Assistant Professor (Quantitative Ecologist). 2007–2013. Department of Biology and Marine Biology, University of North Carolina Wilmington. Full time tenure-track position.

Adjunct Assistant Professor. 2008-2012. Biology Department, Western Kentucky University.
Research mentor for graduate and undergraduate students in collaboration with Dr. Albert Meier.

Postdoctoral Research Scientist. 2005-2007. Computational Learning Laboratory, Center for the Study of Language and Information, Stanford University, Stanford, CA. *Computational Induction of Scientific Process Models.* Advisors: P. Langley and K.R. Arrigo.

Research Assistant. 2003–2005. Skidaway Institute of Oceanography. *Bio-feed back basis of self-organization in planktonic ecosystems using *Phaeocystis* as a model complex adaptive system.* PIs: P.G. Verity, M.E. Frischer, M.E. Hay, B.C. Patten. Skidaway, GA.

Research Assistant. 2002. Institute of Ecology, University of Georgia. *Effects of water withdrawal on inter-annual variability of stream low-flow characteristics.* PI: M. Freeman. Athens, GA.

Research Assistant. 1999–2002. Institute of Ecology, University of Georgia. *Community values and the long-term ecological integrity of rapidly urbanizing watersheds.* PIs: M.B. Beck, B.G. Norton, B.C. Patten, K.G. Porter, T.C. Rasmussen, A. Steinmann. Athens, GA.

Assistant Staff Scientist. 1997–1998. ENTRIX, Inc. Houston, TX. Environmental impact assessment and environmental management planning, primarily for oil and gas exploration and development in the US Gulf Coast and Latin America (Bolivia, Ecuador, Venezuela).

Research Assistant. 1995–1997. Austin College. *Dual interpretation of low intensity light by Japanese Quail and The effect of continuous release melatonin on reproduction in Japanese Quail.* PI: W. Meyer. Sherman, TX.

Teaching Assistant. 1995–1997. Austin College. *Cellular Biology and Anatomy and Physiology.* Undergraduate courses. Professor: W. Meyer. Sherman, TX.

HONORS & AWARDS

- 2009–present Recognized by one or more graduating senior at UNCW as a person whose impact on them was significant. 2009, 2010, 2011, 2012, 2013
- 2011 Research Reassignment, Dept. of Biology and Marine Biology, UNCW (1 semester without teaching to focus on research, completed Spring 2013)
- 2009 Chancellor's *Discere Aude* Award for outstanding mentorship, UNCW.
- 1997 Austin College, *cum laude*
- 1997 $\beta\beta\beta$, Biology Honor Society
- 1997 Austin College, M.D. "Bud" Bryant Fellowship, Outstanding Biology Student
- 1993–1997 Austin College, Trustees Scholarship (\$3000 per year)
- 1997 Austin College, Leadership Honor Society
- 1989 Eagle Scout, Troop 2, El Paso, TX

RESEARCH

Publications

* postdoc, ** graduate student, *** Undergraduate student

[Link to my profile on Google Scholar](#)

Peer Reviewed

In preparation

Borrett, S.R., M. Lau **. *enaR: An R package for Ecological Network Analysis*.

Borrett, S.R., Carter ***, M. *Four general ecosystem properties that are more intense in biogeochemical cycling networks than trophic webs*.

Borrett, S.R., J. Moody, J. A. Edelmann *. *Mapping topic networks and scientific collaboration in network ecology*.

Submitted

Hines, D.E. **, S.R. Borrett. *Comparison of Network, Neighborhood, and Node levels of analysis in two models of nitrogen cycling in the Cape Fear River Estuary*. **Ecological Modelling**. (July 15, 2013)

Hines, D.E. **, J.A. Lisa **, B. Song, C.R. Tobias, S.R. Borrett. *Estimating the impacts of sea level rise on the coupling of estuarine nitrogen cycling processes through comparative network analysis*. **Limnology and Oceanography** (June 5, 2013) IN REVISION

In Print (#14–#27 since arriving at UNCW)

27. Brasso **, R., B. Drummond ***, S.R. Borrett, A. Chiaradia, M. Polito, A. Raya-Rey. In press. *Unique pattern of molt leads to low intra-individual variation in feather mercury concentrations in penguins*. **Environmental Toxicology & Chemistry**. Accepted May 21, 2013.
26. Borrett, S.R. 2013. *Throughflow centrality is a global indicator of the functional importance of species in ecosystems*. **Ecological Indicators** 32:182–196. [doi:10.1016/j.ecolind.2013.03.014](https://doi.org/10.1016/j.ecolind.2013.03.014) Preprint: [arXiv:1209.0725 \[q-bio.QM\]](https://arxiv.org/abs/1209.0725).
25. Hines **, D.E., J.A. Lisa **, B. Song, C.R. Tobias, S.R. Borrett. 2012. *A network model shows the importance of coupled processes in the microbial N cycle in the Cape Fear River Estuary*. **Estuarine, Coastal and Shelf Science**. 20: 45–75. [doi:10.1016/j.ecss.2012.04.018](https://doi.org/10.1016/j.ecss.2012.04.018)
24. Fann ***, S.L. and S.R. Borrett. 2012. *Environ centrality reveals the tendency of indirect effects to homogenize the functional importance of species in ecosystems*. **Journal of Theoretical Biology**

- 294: 74–86. doi:10.1016/j.jtbi.2011.10.030 arXiv:1110.5385v1 [q-bio.PE]
23. Borrett, S.R., M.A. Freeze, and A.K. Salas**. 2011. *Equivalence of the ecological network analysis realized input and output oriented indirect effects metric*. **Ecological Modelling** 222:2142–2148. doi: 10.1016/j.ecolmodel.2011.04.003
22. Borrett, S.R. and M.A. Freeze. 2011. *Reconnecting environs to their environment*. **Ecological Modelling** 222: 2293–2403. doi:10.1016/j.ecolmodel.2010.10.015
21. Salas**, A.K. and S.R. Borrett. 2011. *Evidence for dominance of indirect effects in 50 trophic ecosystem networks*. **Ecological Modelling** 222: 1192–1204. arXiv:1009.1841v1 [q-bio.PE]; doi: 10.1016/j.ecolmodel.2010.12.002
20. Borrett, S.R., S.J. Whipple, & B.C. Patten. 2010. *Rapid development of indirect effects in ecosystem networks*. **Oikos** 119: 1136–1148. doi: 10.1111/j.1600-0706.2009.18104.x
19. Borrett, S.R., A.K. Salas**. 2010. *Evidence for resource homogenization in 50 trophic ecosystem network*. **Ecological Modelling** 221: 1710–1716. doi:10.1016/j.ecolmodel.2010.04.004.
18. Kaufman ***, A.G. & S.R. Borrett. 2010. *Ecosystem network analysis indicators are generally robust to parameter uncertainty in a phosphorus model of Lake Sidney Lanier, USA*. **Ecological Modelling** 221: 1230–1238 doi:10.1016/j.ecolmodel.2009.12.018
17. Bata, S.A., S.R. Borrett, B.C. Patten, S.J. Whipple, J.R. Schramski, D.K. Gattie. 2007. *Equivalence of throughflow- and storage-based environs*. **Ecological Modelling**. 206: 400–406 doi:10.1016/j.ecolmodel.2007.04.005
16. Bridewell, W., S.R. Borrett, & L. Todorovski. 2007. *Extracting constraints for process modeling*. Proceedings of the Fourth International Conference on Knowledge Capture (pp. 87-94). Whistler, BC.
15. Schramski, J.R., D.K. Gattie, B.C. Patten, S.R. Borrett, B.D. Fath, S.J. Whipple. 2007. *Indirect effects and distributed control in ecosystems: Distributed control in the environ networks of a seven-compartment model of nitrogen flow in the Neuse River Estuary, USA: Time series analysis*. **Ecological Modelling** 206: 18–30. doi:10.1016/j.ecolmodel.2007.03.023
14. Whipple, S.J., S.R. Borrett, B.C. Patten, D.K. Gattie, J.R. Schramski, S.A. Bata. 2007. *Indirect effects and distributed control in ecosystems: Comparative network environ analysis of a seven-compartment model of nitrogen flow in the Neuse River Estuary: Time series analysis*. **Ecological Modelling** 206: 1–17. doi:10.1016/j.ecolmodel.2007.03.002
13. Whipple, S.J., B.C. Patten, P.G. Verity, M.E. Frischer, J.D. Long, J.C. Nejstgaard, J.T. Anderson, A. Jacobsen, A. Larsen, J. Martinez-Martinez, and S.R. Borrett. 2007 *Gaining integrated understanding of *Phaeocystis spp.* through model-driven laboratory and mesocosm studies*. **Biogeochemistry** 83:293–309. doi:10.1007/s10533-007-9089-z
12. Borrett, S.R., W. Bridewell, P. Langley, K.R. Arrigo. 2007. *A method for representing and developing process models*. **Ecological Complexity** 4: 1–12. doi:10.1016/j.ecocom.2007.02.017
11. Borrett, S.R., B.D. Fath, B.C. Patten. 2007. *Functional integration of ecological networks through pathway proliferation*. **Journal of Theoretical Biology** 245: 98–111. doi:10.1016/j.jtbi.2006.09.024
10. Borrett, S.R. and O.O. Osidile. 2007. *Environ indicator sensitivity to flux uncertainty in a phosphorus model of Lake Sidney Lanier, USA*. **Ecological Modelling** 200: 371–383. doi:10.1016/j.ecolmodel.2006.08.011
9. Bridewell, W., P. Langley, S. Racunas, and S.R. Borrett. 2006. *Learning process models with missing data*. Proceedings of the Seventeenth European Conference on Machine Learning (pp. 557-565). Berlin: Springer.

8. Nejstgaard, J.C., M.E. Frischer, P.G. Verity, J.T. Anderson, A. Jacobsen, M.J. Zirbel, A. Larson, J. Martínez-Martínez, A.F. Sazhin, T. Walters, D.A. Bronk, S.J. Whipple, S.R. Borrett, B.C. Patten, and J.D. Long. 2006. *Plankton development and trophic transfer in sea water enclosures with added nutrients and Phaeocystis pouchetii*. **Marine Ecology Progress Series** 321: 99–121.
7. Gattie, D.K., J.R. Schramski, S.R. Borrett, B.C. Patten, S.A. Bata, S.J. Whipple. 2006. *Indirect effects and distributed control in ecosystems: Network environ analysis of a seven-compartment model of nitrogen flow in the Neuse River Estuary, USA—Steady-state analysis*. **Ecological Modelling** 194: 162–177. doi:10.1016/j.ecolmodel.2005.10.017
6. Borrett, S.R., S.J. Whipple, B.C. Patten, R.R. Christian. 2006. *Indirect effects and distributed control in ecosystems: Temporal variation of indirect effects in a seven-compartment model of nitrogen flow in the Neuse River Estuary, USA—Time series analysis*. **Ecological Modelling** 194: 178–188. doi:10.1016/j.ecolmodel.2005.10.011
5. Schramski, J.R., D.K. Gattie, B.C. Patten, S.R. Borrett, B.D. Fath, C.R. Thomas, S.J. Whipple, 2006. *Indirect effects and distributed control in ecosystems: Distributed control in the environ networks of a seven-compartment model of nitrogen flow in the Neuse River Estuary, USA—Steady-state analysis*. **Ecological Modelling** 194: 189–201. doi:10.1016/j.ecolmodel.2005.10.012
4. Fath, B.D. and S.R. Borrett. 2006. *A MATLAB® function for network environ analysis*. **Environmental Modelling & Software** 21: 375–405. doi:10.1016/j.envsoft.2004.11.007
3. Cowie, G.M. and S.R. Borrett. 2005. *Institutional perspectives on participation and information in water management*. **Environmental Modeling & Software** 20: 469–483. doi:10.1016/j.envsoft.2004.02.006
2. Borrett, S.R. and B.C. Patten. 2003. *Structure of pathways in ecological networks: Relationship between length and number*. **Ecological Modelling** 170: 173–184. doi:10.1016/S0304-3800(03)00224-2
1. Beck, M.B., B.D. Fath, A. K. Parker, O.O. Osidile, G.M. Cowie, T.C. Rasmussen, B.C. Patten, B.G. Norton, A. Steinmann, S.R. Borrett, D. Cox, M.C. Mayhew, X.-Q. Zeng, and W. Zeng. 2002. *Developing a concept of adaptive community learning: Case study of a rapidly urbanizing watershed*. **Integrated Assessment** 3:299–307.

Book Chapters & Reports

4. Borrett, S.R., R.R. Christian, R., R.E. Ulanowicz. 2012. *Network Ecology (Revised)*. In: A.H. El-Shaarawi and W.H. Piegorsch (Eds.). Encyclopedia of Environmetrics (2nd edition). John Wiley and Sons: Chinchester, pp. 1767-1772. doi:10.1002/9780470057339.van011.pub2
3. Bridewell, W., S.R. Borrett, P. Langley. 2009. *Innovative construction of explanatory scientific models*. In: A.B. Markman and K.L. Wood (Eds.) Tools for Innovation. Oxford University Press, NY.
2. Patten, B.C., B.D. Fath, J.S. Choi, S. Bastianoni, S.R. Borrett, S. Brandt-Williams, M. Debeljak, J. Fonseca, W.E. Grant, D. Karnawati, J.C. Marques, A. Moser, F. Müller, C. Pahl-Wostl, R. Seppelt, W.H. Steinborn, Y.M. Svirezhev. 2002. *Complex adaptive hierarchical systems*. In: R. Costanza and S.E. Jørgensen (Eds.). Understanding and Solving Environmental Problems in the 21st Century: Toward a New, Integrated Hard Problem Science. Elsevier Science, Ltd, Oxford, pp. 41–87.
1. Cowie, G.M., S.R. Borrett, and others. 2001. *Foresight for Lanier: A Workshop. Summary of Results*. University of Georgia. January 25, 2001. Athens, GA.

Software

2. Lau, M. Borrett, S.R., and Hines, D.E. 2012. *enaR: Tools for Ecological Network Analysis*. R package version 1.01. <http://CRAN.R-project.org/package=enaR>

1. Fath, B.D. and Borrett, S.R. 2004. NEA.m. Matlab Central File Exchange.
<http://www.mathworks.com/matlabcentral/fileexchange/5261-nea-m>.

Funding

In review

NSF-CHN. *Climate change, environmental change, and the relationships between migration and water related ecosystem services.* Griffith, D., Avenarius, C., Bean, E., Brewer, J., Contreras, R., Luczkovich, J., Manda, A., Miller, R., Van Holt, T. \$1,355,419. Subcontract to UNCW from ECU **\$67,549** for Borrett.

Funded

UNCW Cahill Award: *Creating interdisciplinary capacity and collaborations for ecological network analysis through an immersion at the Duke Network Analysis Center.* Borrett, S.R (PI). **\$2,331** for 1/2013-12/2013.

Duke-UNC Oceanography Consortium. *Proposal for 1-week of ship time in aid of research in Onslow Bay, NC.* Finelli, C. Freshwater, W., Long, Z., Borrett, S.R. Estimated ~**\$100,000** value. 2013.

NSF: Collaborative Research: *Impact of sea level rise on sedimentary nitrogen removal processes in tidal freshwater ecosystem.* B.K. Song (Lead PI), S.R. Borrett (CoPI Responsible for Modelling). **\$500,411** for 2010-2013.

NECSent Catalysis Meeting. *Ecological Models and Social Networks: How evolutionary forces shape networks and communities.* Duke Network Analysis Center (Moody, J lead PI with 11 collaborators including S.R. Borrett). Workshop Funded for 2012-2013.

Office for International Programs travel grant (**\$1500**) to attend the 2011 International Society for Ecological Modelling meeting in Beijing, China. I escorted one graduate and one undergraduate student to the meeting.

UNCW Special Tenure-Track Faculty Travel Fund (**\$1000**) and Office for International Programs (**\$600**) for travel to 2009 International Society for Ecological Modelling Meeting, UNCW. I Escorted one graduate and one undergraduate student to the meeting.

University of Georgia. University-wide Dissertation Completion Award, Ten months of funding (**\$15,000**) to complete dissertation. University of Georgia, Athens, GA.

University of Georgia OVPR International travel funds.. (a) 2004. Fourth European Conference for Ecological Modelling. Bled, Slovenia. (b) 2001. International Society for Ecological Modelling, European Chapter meeting. Dubrovnik, Croatia. (c) 2000. Ecosummit2000. Halifax, Canada.

Unfunded

NSF-INSPIRE: *Environ Analysis of Material and Energy Flows Through Cities: Building a Science of Infrastructure Ecology.* Weissburg, M., Crittenden, J., Guhathakurata, S. Yang, P.P., Leigh, N.G, Borrett, S.R. 2013. **\$3,000,000** for 2014-2017.

NSF- RCN-SEES: *Social, Economic, and Environmental Sustainability and Security of National Animal Protein Production.* DeOtte, R. (PI), and others. Borrett, S.R. (Supporting collaborator). **\$750,000** for 2012-2017.

WRRI Pre-Proposal for EPA Nutrient Center Proposal. *Phosphorus forms and cycling in stormwater runoff and impacts on receiving waters.* Mallin, M.A., Cahoon, L.B., and Borrett, S.R. **\$188,000**.

WRRI/Sea Grant, Land-Sea Margin. *Impact of sea level rise on coupled biogeochemical processes for N removal in the New River Estuary, NC.* Borrett, S.R., Song, B. **\$19,246** for 10/2012-09/2013

New Hanover County Community Foundation. Pre-Proposal: *Developing a Collaborative Study of the Greenfield Lake Environment: Connecting New Hanover County Schools, the Cape Fear River Watch and UNCW*. Borrett, S.R. (PI), Van Tuinen, M. (Co-PI), \$2,000.

UNCW Cahill Award: Visualizing the internal network architecture of marine sponges. Borrett, S.R (PI). \$3,000 for 10/2010-10/2011.

NSF-UMB: BioMaSS: Biological and Mathematic Synergistic Science. S.R, Borrett (Lead PI), S. Simmons, M. Freeze, M. Van Tuinen, A. Stapleton. \$238,879 for 6/15/2009 – 6/15/2012 (declined; Revision and Resubmitted 2009).

NSF-LTREB: Inter-annual variability in coupling of river discharge and estuarine biology. Cahoon, L. S.R, Borrett (CoPI Responsible for modelling), M. Mallin, J. Bailey, M. Posey. \$498,200 for 6/15/2009 – 6/15/2014.

NSF-Computational Discovery Initiative: Meta-modeling for the computational discovery of cross scale processes. Borrett, S.R (Lead PI), A. H. Levis, A.E. Stapleton, J. Sztipanovits. \$449,980 for 6/15/2009 – 6/15/2012.

UNCW Cahill Award: EcoNetBase: A database of ecological models to investigate ecosystem organization and transformation. Borrett, S.R (PI). \$3,000 for 10/2008- 10/2009.

Presentations & Posters

* postdoc, ** graduate student, *** Undergraduate student

81. **Borrett, S.R.**, Moody, J. 2013. *Topics in network ecology and the scientific community that studies them*. Systems Ecology: A Network Perspective and Retrospective. University of Georgia. (April).
80. Hines, D.E., **Borrett, S.R.** 2013. *Node-level and whole-network indicators of the impacts of sea level rise on an estuarine nitrogen cycle*. Systems Ecology: A Network Perspective and Retrospective. University of Georgia. (April).
79. Oxe, E.A., Hines, D.E., **Borrett, S.R.** 2013. *Network mutualism and synergism in a model of nitrogen cycling in the Cape Fear River Estuary, NC*. Systems Ecology: A Network Perspective and Retrospective. University of Georgia. (April).
78. Whipple, S.J., Patten, B.C., **Borrett, S.R.** 2013. *Evaluation of model size, topology, and currency in systems analysis: comparative network environ analysis and nitrogen model time series of the Neuse River estuary, USA*. Systems Ecology: A Network Perspective and Retrospective. University of Georgia. (April).
77. **Borrett, S.R.** 2013. *Throughflow centrality reveals important species in ecosystems and environmental impacts of shrimp trawling in Core Sound, NC*. Invited presentation. Duke Network Analysis Center, Social Science Research Institute, Duke University. (Feb. 26).
76. **Borrett, S.R.** 2012. *Connecting the dots: Developments in ecosystem network theory and the impact of climate change on estuarine N cycling*. Invited presentation. Department of Biology, University of North Carolina Charlotte. (Oct. 26)
75. Mejaski**, J., **Borrett, S.R.** 2012. *Network analysis of the urban water metabolism of Wilmington, North Carolina: Evaluating alternative recycling scenarios for city sustainability*. 4th International EcoSummit, Columbus, Ohio. (Poster, Oct, 4)
74. Hines **, D.E., Lisa **, J.A., Song, B., Tobias, C.R., **Borrett, S.R.** 2012. *Simulating the impact of sea level rise on the microbial nitrogen cycle in tidally influenced regions of the Cape Fear River Estuary, NC, USA*. 4th International EcoSummit, Columbus, Ohio. (Oct, 4)

73. **Borrett, S.R.**, Lau **, M.K. 2012. *An R package for Ecological Network Analysis*. 4th International EcoSummit, Columbus, Ohio. (Oct, 5)
72. Whipple, S.J., Patten, B.C., **Borrett, S.R.** 2012. *Evaluation of Model Size and Currency in Systems Analysis: Comparative Network Environ Analysis of Carbon and Nitrogen Model Time Series for the Neuse River Estuary, USA*. 4th International EcoSummit, Columbus, Ohio. (Oct, 5)
71. Borrett, S.R. 2012. *Connecting the Dots: Development in ecosystem theory and applications of ecosystem network analysis*. Department of Biology and Marine Biology, University of North Carolina Wilmington. (August 31)
70. **Borrett, S.R.**, Deehr, R., Johnson, J.C., Luczkovich, J. 2012. *Centrality Analysis Shows Ecosystem Impact of Trawling in Core Sound, North Carolina, USA*. American Fisheries Society Annual Meeting, St. Paul, MN.
69. Beblo, J. **, **Borrett, S.R.** 2012. *A network analysis comparison of energy flow through the Dublin Bay and Baie de Somme intertidal ecosystem*. Undergraduate Research Showcase, UNCW. (Poster) Winner of Biology and Marine Biology undergraduate poster award.
68. Hines **, D.E., Lisa **, J.A., Song, B., Tobias, C.R. and **Borrett, S.R.** 2012. *Environ analysis of a nitrogen mass balance network model*. 112th General meeting of American Society for Microbiology, San Francisco, CA
67. Hines **, D.E., Lisa **, J.A., Song, B., Tobias, C.R., **Borrett, S.R.** 2012. *Environ analysis of a nitrogen mass balance network model: quantifying microbial interactions in an estuarine nitrogen cycle*. UNCW Graduate Student Symposium, UNCW and Wilmington Information Technology Expo (WITX), Department of Computer Science, UNCW.
66. **Borrett, S.R.** 2012. *Connecting the dots: Developments in ecosystem theory and an application of ecosystem network analysis to investigate nitrogen cycling in the Cape Fear River Estuary, NC*. Invited presentation. Department of Biology, Eastern Carolina University. (Feb. 23)
65. **Borrett, S.R.** 2012. *Ecological network analysis: recent work and future opportunities at UNCW*. Invited presentation. Department of Computer Science, UNCW.
64. **Borrett, S.R.** 2011. *Undergraduate learning through biological research*, Center for Teaching Excellence, Teaching Celebration, UNCW.
63. Hines **, D.E., Lisa **, J.A., Song, B., Tobias, C.R., **Borrett, S.R.** 2011. *Modeling the effects of sea level rise on estuarine nitrogen cycle: examining the fate and transport of nitrogen in the Cape Fear River Estuary, NC, USA*. 21st Biennial Conference of the Coastal and Estuarine Research Federation. Daytona Beach, FL.
62. Hines **, D.E., Lisa **, J.A. Song, B., **Borrett, S.R.** 2011. *Sea level rise and the alternative fates of nitrogen in the Cape Fear River Estuary, NC, USA: a microbial view*. Biennial Meeting, International Society for Ecological Modelling, Beijing, China.
61. Carter ***, M., **Borrett, S.R.** 2011. *Indirect effects, network homogenization, and network aggradation are stronger in biogeochemical networks than in trophic ecosystem models*. Biennial Meeting, International Society for Ecological Modelling, Beijing, China. (Poster)
60. **Borrett, S.R.** 2011. *Node throughflow is a global centrality measure of species importance in ecosystem flow networks*. Biennial Meeting, International Society for Ecological Modelling, Beijing, China.
59. Missik ***, J., Coates, K., Meier, A.J., Kessler, B., **Borrett, S.R.** 2011. *Influences of microbial networks on food webs*. Annual Meeting, Ecological Society of America. Austin, TX. (Poster)

58. **Borrett, S.R.** 2011. *Importance of indirect effects in ecosystems revealed by network analysis.* Invited presentation. Northern Arizona University. Flagstaff, AZ.
57. **Borrett, S.R.** 2010. *Network Analysis Exposes Hidden Relationships in Ecological Systems.* Invited presentation. Duke Network Analysis Center, Duke University. Durham, NC.
56. Himes, M., Metwally ***, A. **Borrett, S.R.**, Bourdelais, A. Taylor, A.R. 2010. *Do algal toxins affect sensory behavior of marine ciliates?* Southeaster Phycological Colloquy, UNCW Center for Marine Science, NC. (Poster)
55. **Borrett, S.R.** Whipple, S.J., Patten, B.C. 2010. *Rapid Development of Indirect Effects in Ecological Networks.* Statistical and Applied Mathematical Sciences Institute workshop on Complex Networks. Research Triangle, NC. (Poster)
54. **Borrett, S.R.**, Salas **, A.K. 2010. *Evidence for resource homogenization in 50 trophic ecosystem networks.* Annual Meeting, Ecological Society of America. Pittsburgh, PA.
53. Missik ***, J.E., Meier, A.J., **Borrett, S.R.**, Ayers, K., Kessler, B. 2010. *Addition of microbial loops to food webs: Increases in connectivity, pathway proliferation, and dominant eigenvalues.* Annual Meeting, Ecological Society of America. Pittsburgh, PA. (Poster)
52. **Borrett, S.R.** 2009. *Resource roadmaps reveal how ecosystem connectivity influences species and whole -system functioning.* Biology Department, University of North Carolina Wilmington. Wilmington, NC.
51. **Borrett, S.R.** 2009. Network models for (soil) ecology. Invited presentation. NIMBioS Investigative Workshop: New Soil Black Box Math Strategies, NIMBioS, Knoxville, TN.
50. **Borrett, S.R.** 2009. *Dominance of indirect effects in ecological networks: Holoecology Emerging.* Invited presentation. Institute of Marine Science, University of North Carolina Chapel Hill, Morehead City, NC.
49. **Borrett, S.R.**, Freeze, M.A., Salas **, A. K. 2009. *Reconnecting environs to their environments.* Meeting of the International Society for Ecological Modelling, Quebec City, Canada.
48. Freeze, M.A., **Borrett, S.R.**, Salas **, A. K. 2009. *Sufficient conditions for threshold insensitivity of network environ analysis dominance of indirect indicators to boundary input.* Meeting of the International Society for Ecological Modelling, Quebec City, Canada.
47. Salas **, A.K., **Borrett, S.R.** 2009. *Evidence for the dominance of indirect effects in trophically-based ecosystem networks.* Meeting of the International Society for Ecological Modelling, Quebec City, Canada.
46. Whipple, S.J., **Borrett, S.R.**, Patten, B.C. 2009. *Storage-based comparative network environ analysis of a seven-compartment model of nitrogen flow in the Neuse River estuary, USA—Time series analysis.* Meeting of the International Society for Ecological Modelling, Quebec City, Canada.
45. Fann ***, S.L., **Borrett, S.R.** 2009. *Positional importance of species in ecosystems: considering direct and indirect effects through a network environ analysis approach.* Meeting of the International Society for Ecological Modelling, Quebec City, Canada.
44. Kaufman ***, A., **Borrett, S.R.** *Ecosystem network analysis indicators are generally robust to parameter uncertainty in a phosphorus model of Lake Sidney Lanier, USA.* Meeting of the International Society for Ecological Modelling, Quebec City, Canada. and UNCW CSURF Annual Showcase.
43. **Borrett, S.R.** 2009. *Network architecture and the development of indirect effects.* Invited presentation. North Carolina State University, Biomath group, Raleigh, NC (April 16th)

42. Fann ***, S.L. **Borrett, S.R.** 2009. *Quantifying species potential for controlling ecosystem dynamics*. UNCW CSURF Annual Showcase.
41. Fann ***, S.L. **Borrett, S.R.** 2009. *Measuring control in ecosystems: interpreting the eigenspectrum of the ecological network analysis flow intensity matrix*. CAA Undergraduate Research Conference Towson, MD.
40. Salas **, A.K. Borrett, S.R. 2009. *Modeling indirect selective in a co-evolving community: preliminary work*. Darwin's Legacy: Evolution's Impact on Science & Culture: A multidisciplinary conference, Wilmington, NC.
39. Muzychuk **, L.A., **Borrett, S.R.**, Finelli, C.M. 2009. *Feeding behavior of Upogebia affinis: Food source partitioning and effects on benthic-pelagic coupling*. 38th Benthic Ecology Meetings, Corpus Christi, TX.
38. **Borrett, S.R.** Whipple*, S.J., Patten, B.C. 2008. *Rapid development of indirect effects in ecological networks*. Annual Meeting, Ecological Society of America. Milwaukee, WI. and at UGA Ecological Network Analysis Meeting, Athens, GA.
37. Bowers **, J.L., Meier, A.J., and **Borrett, S.R.** 2008. *Eigenvector analysis of connectivity in food webs*. Annual Meeting, Ecological Society of America. Milwaukee, WI.
36. Bowers **, J.L., Meier, A.J., and **Borrett, S.R.** 2008. *Use of eigenvector and network environ analysis (NEA) in the quantification of keystone species*. Annual Meeting, Society for Conservation Biology. Chattanooga, TN.
35. **Borrett, S.R.** 2008. *Hidden links that sustain ecosystems: the rapid development of indirect effects in the Neuse River Estuary*. Invited Presentation, Eastern Carolina University, NC. Jan. 24th.
34. **Borrett, S.R.** 2007. *Network architecture determines the development of indirect effects in ecosystems*. Invited Presentation, Western Kentucky University, Bowling Green, KY. Nov. 30
33. **Borrett, S.R.** 2007. *Searching for ecosystem models that explain phytoplankton dynamics in the Ross Sea*. Invited Presentation, University of Georgia, Athens, GA.
32. **Borrett, S.R.** 2007. *Searching for ecosystem models that explain phytoplankton dynamics in the Ross Sea*. Invited Presentation, USGS, Menlo Park, CA.
31. **Borrett, S.R.**, W. Bridewell, P. Langley, K.R. Arrigo. 2007. *Value of information in modeling the Ross Sea ecosystem*. Polar Marine Science Gordon Research Conference. Ventura, CA.
30. **Borrett, S.R.** 2007. *Hidden links that sustain ecosystems*. Invited presentation, University of North Carolina, Wilmington, NC.
29. **Borrett, S.R.**, W. Bridewell, P. Langley, K.R. Arrigo. 2006. *Process sensitivity analysis for ecological modeling*. 5th International Conference on Ecological Informatics. Santa Barbara, CA.
28. **Borrett, S.R.**, W. Bridewell, P. Langley. 2006. *Computational discovery of process models of aquatic ecosystems*. 91st Annual Meeting, Ecological Society of America. Memphis, TN.
27. **Borrett, S.R.**, W. Bridewell, P. Langley, K.R. Arrigo. 2006. *A hierarchical process model of the Ross Sea ecosystem*. Eos Trans. AGU, 87(36), Ocean Sciences Meeting Supplement, Abstract OS43K-06.
26. **Borrett, S.R.** 2005. *Ecosystem organization and transformation: The role of network architecture in the development of indirect effects*. Dissertation Defense. Institute of Ecology, Athens, GA.
25. **Borrett, S.R.**, O.O. Osidile, B.C. Patten, M.B. Beck. 2005. *Environ sensitivity to flux uncertainty in a phosphorus model of Lake Sidney Lanier, USA: Preliminary Results*. Annual International Meeting, Institute of Biological Engineering. Athens, GA.

24. Patten, B.C., S. Bata, **S.R. Borrett**, B.D. Fath, D.K. Gattie, J.R. Schramski, H.J. Turk, S.J. Whipple. 2004. *Indirect effects and distributed control in ecosystems 1. Environ analysis and network environ analysis: Introduction and overview*. Fourth European Conference on Ecological Modelling. Bled, Slovenia.
23. Gattie, D.K., J.S. Schramski, **S.R. Borrett**, B.C. Patten, H.J. Turk. 2004. *Indirect effects and distributed control in ecosystems 2. Environ analysis of a seven-compartment model of nitrogen flow in the Neuse River Estuary, USA: The static case*. Fourth European Conference on Ecological Modelling. Bled, Slovenia.
22. **Borrett, S.R.**, S.J. Whipple, B.C. Patten. 2004. *Indirect effects and distributed control in ecosystems 3. Temporal variation of indirect effects in a nitrogen flow model of the Neuse River Estuary, USA: time series analysis*. Fourth European Conference on Ecological Modelling. Bled, Slovenia.
21. Whipple, S.J., **S.R. Borrett**, B.C. Patten. 2004. *Indirect effects and distributed control in ecosystems 4. Comparative environ analysis of a seven-compartment model of nitrogen flow in the Neuse River Estuary, USA: the discrete time case*. Fourth European Conference on Ecological Modelling. Bled, Slovenia.
20. Schramski, J.S., D.K. Gattie, B.C. Patten, S.J. Whipple, **S.R. Borrett**, and B.D. Fath. 2004. *Indirect effects and distributed control in ecosystems 5. Distributed Control in the environ network of a seven-compartment model of nitrogen flow in the Neuse River Estuary, USA: static analysis*. Fourth European Conference on Ecological Modelling. Bled, Slovenia.
19. **Borrett, S.R.** and B.D. Fath. 2004. *Pathway proliferation in ecological networks*. Annual Meeting, Ecological Society of America. Portland, OR.
18. Gattie, D.K., J.S. Schramski, **S.R. Borrett**, B.C. Patten, H.J. Turk, S.J. Whipple. 2004. *Analysis of ecosystems as a network of environments*. Annual Meeting, American Ecological Engineering Society. Fayetteville, AR.
17. **Borrett, S.R.** 2004. *Biodiversity determines pathway proliferation in ecological networks: Preliminary results*. Graduate Student Symposium, Institute of Ecology, University of Georgia. Athens, GA.
16. Whipple, S.J., B.C. Patten, **S.R. Borrett**. 2003. *Phaeocystis: a biocomplex life-form on a biogeochemically complex planet: using conceptual modeling to guide team research*. Meeting of Phaeocystis SCOR Work Group. Savannah, GA.
15. Patten, B.C., **S.R. Borrett**, S.J. Whipple, R.R. Christian, C.R. Thomas. 2003. *Discrete-time dynamic environ analysis of indirect effects in ecological networks: basic considerations*. Annual Meeting, Ecological Society of America. Savannah, GA.
14. **Borrett, S.R.** 2003. *Development of environ indirect effects in ecological flow networks: initial lessons from the Neuse River Estuary*. Annual Meeting, Ecological Society of America. Savannah, GA.
13. Gattie, D.K. and **S.R. Borrett**. 2003. *Indirect effects in transport networks*. Annual Meeting, American Ecological Engineering Society. College Park, MD.
12. Gattie, D.K. and **S.R. Borrett**. 2003. *Network indirect effects in transport networks: integral elements of system complexity*. Annual International Meeting, Institute of Biological Engineering. Athens, GA.
11. Patten, B.C., S.J. Whipple, **S.R. Borrett**. 2003. *Pattern and process in the steady-state transport of energy and matter in model ecosystems: perspectives from the theory of environs*. Annual International Meeting, Institute of Biological Engineering. Athens, GA.

10. **Borrett, S.R.** 2003. *Network indirect transactions in the Neuse River Estuary*. Graduate Student Symposium, Institute of Ecology, University of Georgia. Athens, GA.
9. **Borrett, S.R.** 2002. *Investigating pathway proliferation in ecological networks*. Annual Meeting, Ecological Society of America. Tucson, AZ.
8. **Borrett, S.R.** 2002. *Introduction to environs*. Long Term Ecological Research Program Network Analysis Workshop. Sevilleta, NM.
7. **Borrett, S.R.** and B.C. Patten. 2002. *System size and connectance determine the relationship between pathway length and the number of pathways in ecological networks: preliminary results*. Graduate Student Symposium, Institute of Ecology, University of Georgia. Athens, GA.
6. **Borrett, S.R.** 2001. *Incorporating citizen knowledge into an ecosystem model of Flower Branch Bay: an initial science-based model*. 3rd European Ecological Modelling Conference, International Society for Ecological Modelling European Chapter. Dubrovnik, Croatia.
5. Beck, M.B., A.K. Parker, T.C. Rasmussen, B.C. Patten, **S.R. Borrett**, B.G. Norton, A. Steinemann. 2001. *Community values and the long-term ecological integrity of rapidly urbanizing watersheds*. EPA-NSF Water and Watershed Grant Meeting. San Francisco, CA.
4. **Borrett, S.R.** 2001. *Sources of system complexity in the Lake Lanier ecosystem, Georgia*. Annual Meeting, Ecological Society of America. Madison, WI.
3. **Borrett, S.R.** 2001. *Exploring systems complexity*. Graduate Student Symposium, Institute of Ecology, University of Georgia. Athens, GA.
2. **Borrett, S.R.**, B.D. Fath, B.C. Patten. 2000. *Incorporating stakeholder concerns into a lake ecosystem model: a heuristic tool for Lake Lanier*. Graduate Student Symposium, Institute of Ecology, University of Georgia. Athens, GA; also presented at 9th Annual Conference, Southeastern Division, North American Lake Management Society. Columbus, GA.
1. **Borrett, S.R.**, B.D. Fath, B.C. Patten. 2000. *Incorporating stakeholder concerns into a lake ecosystem model: A heuristic tool for Lake Lanier*. Ecosummit2000. Halifax, Nova Scotia, Canada.

TEACHING

Classroom, Laboratory, & Field

Systems Ecology. 1-week intensive graduate course. Beijing Normal University, Summer 2013.
Invited by Bin Chen.

Systems Ecology and Ecological Network Analysis. Short course for graduate and undergraduate students. UNCW: SU2011

Introduction to Ecology. Undergraduate course. Large lecture format with 75-150 students. UNCW: SP 2008, SP 2009, SP 2010.

Ecology Laboratory. Undergraduate course. Faculty coordinator responsible for curriculum, lab preparation, and managing and preparing 3-4 TAs. I also occasionally teach sections. UNCW: SP 2008, F 2009, SP & SU 2010, SP & SU 2011, SP & SU 2012.

Senior Seminar: Bringing the Biosphere Home. Undergraduate seminar. UNCW: 2008

Fundamentals of Ecological Modeling. Graduate lecture and laboratory. UNCW: 2007, 2008, 2010, 2011, 2012. Co-taught this course with K.R. Arrigo at Stanford University in 2006.

Ecological Thought: Past to Present. Graduate seminar course. UNCW: F 2008, F 2010, F 2011. Co-developed and co-taught the course at the University of Georgia with B.C. Patten and S.J. Whipple where it is now a required course for UGA ecology graduate students.

Ecosystem Complexity in the Marine Environment – Seeking an Answer to the Question: What is Biocomplexity? Skidaway Institute of Oceanography: 2003. Three week short course for undergraduate and graduate students. Co-instructors: P.G. Verity, M.E. Fischer, B.C. Patten, S.J. Whipple. Skidaway, GA.

Theory of Systems Ecology, Guest Lecturer and Teaching Assistant for graduate course. Institute of Ecology 2002. Professor: B.C. Patten. Athens, GA.

Workshops

Ecological Network Analysis. (2011). Northern Arizona University. 1-Day workshop.

Network Environ Analysis: Windows into Eco-System Environments (2007). Western Kentucky University. 1-Day workshop.

Funding

Funded

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|------|--|
| 2013 | Borrett, S.R. <i>Development of a Systems Thinking Learning Module for UNCW</i> . Center for Teaching Excellence Summer Pedagogy Development Initiatives, University of North Carolina Wilmington. \$3500 . |
| 2013 | Pabst, A. Borrett, S.R. <i>Funds to purchase the ELMO TT-12 Interactive Document Camera</i> . Friends of UNCW, Wilmington, NC. \$885 . |
| 2011 | Frampton, A., Emslie, S, Finelli, C, Van Tuinen, M., Long, Z, Pyott, S., Pabst, A. and Borrett, S.R., UNCW Quality Enhancement Plan Pilot Grant. <i>UNCW: Enhancing applied learning through explorations of the natural world</i> , \$13,390 . |
| 2011 | Bruce, K. E., Atwill, W. D., Kelley, P.H., Borrett, S.R. UNCW Quality Enhancement Plan Pilot Grant, <i>Experience Research: Enhancing the CSURF program to promote engagement in research as applied learning</i> , \$31,500 . |
| 2010 | UNCW College of Arts and Sciences, <i>Summer Curriculum Development Initiative</i> . Proposal to revise the Ecology Laboratory (BIOL366) to (1) Better align the course activities and assessment with the departmental and university learning outcomes; (2) Formalize the laboratory report format so that it is consistent across labs in BIOL 366 and makes use of a biological writing text recently adopted by the department; and (3) Integrate the use of spreadsheets (e.g. Microsoft Excel) to teach the students to organize, manage, and analyze biological data, \$3,500 |
| 2008 | Borrett, S.R. and C. Finelli. UNCW Biology and Marine Biology Equipment Committee. We requested funds for a departmental video camera to record departmental seminars so that students can practice critiquing science presentations and witness and critique their own presentations. This purchase was targeted to help students in senior seminars, BIO495, \$600 |

Mentoring

Primary Mentor

Faculty

1. Todd LaMaskin. Assistant Professor, Department of Geology and Geography, University of North Carolina Wilmington. (2012–present)

Ph.D.

1. David E. Hines. PhD. Marine Biology (2011 – present)

M.S.

4. Emily Oxe. M.S. Biology (2012 – present).

3. John Mejaski. M.S. Marine Biology (2011 – present).
2. Youri N. Nelson. M.S. Applied Mathematics 2011. (Co-Advisor with Dr. Feng) *Hierarchical inductive process modeling and analysis.* Next Step: Mormon Mission.
1. Andria K. Salas. M.S. Marine Science. 2010. *Indirect effects in trophic and evolutionary networks.* Next Step: After completing her degree, Andria started a Ph.D. in Biology at the University of Texas at Austin.

Undergraduate Honors Theses

2. Sarah L. Fann. Honors Thesis (B.S. Marine Biology and Statistics, 2010). *Environ centrality quantifies the relative roles of species in generating ecosystem activity.* Next Step: After completing her degree, Sarah completed a Fullbright Scholarship in Australia.
1. Anthony G. Kaufman. Honors Thesis (B.S. Marine Biology, 2009) *Ecological network analysis indicators are robust to flux uncertainty in Lake Sidney Lanier, USA.* Next Step: After completing her degree, Tony started a MS degree at the University of Maryland.

Directed Independent Study Students

Monty Carter, 2009-2011	Nathan Marceil, 2008
Peter Thompson, 2009-2011	Youri Nelson, 2010
Jasmyn Ferbish, 2011	Louis Shakleton, 2012
Jeremy Miller, 2011	Julienne Beblo, 2011-2012
John Webber, 2011	Kasey Palmquest, 2013
Drew Braden, 2010	Amanda Laraia, 2011
Rachel Feller, 2008	

Advisory Committee Member

Ph.D.

Astrid Layton (Engineering, GA Tech)	Leigh Ann Harden	Lindsey Deignan
Lisa Hollensead	Nikolai Klibansky	Mike Polito (UNCW, 2012)
Rebekka Brasso	Matt Lau (NAU)	Christi Visaggi (UNCW, 2012)
	Jess Lisa	

M.S.

Tiffany Lewis	Amber Morris	Brad Parnell
Andrew Long	Lou Muzuczek	Jessica Mallindine
Wai Long	Lisa OGawa	Jennifer Idol (2013)

Honors Advisory Committees

Peter Lawson, Honors (Biology, 2013). Primary mentor: Dr. Stapleton.

Corey Rand, Honors (Mathematics, 2013). Primary mentor: Dr. Freeze.

Drew Howard, Honors (Marine Biology, 2012). *Effects of beach re-nourishment on ocean surf-zone turbidity: Assessment using a predictive model.* Primary mentor: Dr. Lankford.

Ahmed Metwally, Honors (Marine Biology, 2011). *Do algal toxins affect the swimming behavior of microzooplankton?* Primary mentor: Dr. Taylor.

Anna Robuck, Honors (Marine Biology, 2010). *Testing natural products from the sponge *Aplysilla longispina* and tunicate *Eudistoma hepaticum* for the development of nontoxic antifouling paints.* Primary mentor: Dr. Pawlik.

SERVICE & LEADERSHIP

Professional

Reviewer. *Ecological Modelling, Environmental Modelling & Software, Oikos, Ecology Monographs, Ecology Letters, Ecological Indicators, Acta Ecologica Sinica, Environmental Management, Landscape and Urban Planning, Environmetrics.*

Organizing Committee. *Systems Ecology: A Network Perspective and Retrospective.* A workshop in honor of the 45th anniversary of Professor Bernard C. Patten at the University of Georgia (April 12-14, 2013). One of 3 co-organizers (Stuart J. Whipple, Brian D. Fath).

Judge, *Theory Section Award for best presentation.* (2010). 95st Annual Meeting, Ecological Society of America. Pittsburgh, PA.

Organizing committee. *University of Georgia Ecological Network Analysis Conference* (2008). Athens, GA

Moderator. Contributed Session, Ecological Society of America Meeting, August 2008.

Judge, *Buell Student Award for best presentation* (2006), 91st Annual Meeting, Ecological Society of America. Memphis, TN.

Conference Assistant (2002). Lilly Conference on College & University Teaching (South). Athens, GA.

Conference Assistant (2001). Annual Meeting, Ecological Society of America. Madison, WI.

Community

Advisory Board Member. *Cape Fear Economic Development Council* (2013-present), Wilmington, NC.

Advisory Board Member. *Cape Fear Museum of Science and History* (2010-present), New Hanover County, NC.

Invited Lecture. *Ecological address and neighbors of the Lower Cape Fear Region.* Cape Fear River Watch, First Saturday public lecture series. (June 2, 2012).

Member. *STEM Regional Roundtable* (2011-2012). Committee of formal and informal educators, businesses, and NPOs and NGOs.

Member. *Environmental Sustainability Committee* (2009-2010). Church of the Servant Episcopal Church, Wilmington, NC. This committee is planned and executed a community meeting to learn about environmental stewardship from a faith perspective held Feb. 2010. I participated in regular meetings and co-led the search for the keynote speaker. Wilmington, NC.

Organizer & Leader. Tour of the Wilmington Northside Waste Water Treatment Plant. (2009). Environmental Sustainability group from the Church of the Servant Episcopal Church. Wilmington, NC.

Department, College, and University

Member, University Curriculum standing committee, Faculty Senate, UNCW. (2013-present).

Advisory Board Member, Center for Teaching Excellence, UNCW. (2010-present).

Advisory Board Member, Center for the Support of Undergraduate Research and Fellowships. UNCW. (2009-present).

Co-Led (with Roger Shew and Amanda Willard) CTE Workshop. *A Tour of UNCW's Outdoor Classrooms.* March 12, 2013

Liaison. Department Liaison to campus Information and Technology Services (2010-present).

Liaison. Department Liaison to Center for Teaching Excellence (2010-2013).

Member, Advancement and Student Relations Committee, Dept. Biology and Marine Biology, UNCW. (2012).

This committee evaluated the merits of starting a Departmental Facebook page and helped hire Jen Cole to initiate the page.

Undergraduate Assessment Committee Member (2009-2013). *Coordinator* (Fall 2011– Spring 2013).

This committee met approximately every other week during Fall 2009 and Spring 2009 to design and implement the assessment of the departmental learning objectives. It currently meets a 3-4 times a semester.

Faculty Search Committee Member, *Coastal and Marine Biologist* (4 Faculty Positions). UNCW Dept. of Biology and Marine Biology. Reviewed ~300 applications. Successfully recruited Susanne Brander, Susanna Lopez-Legentil, Rob Condon, and Stephanie Kamel.

Provost and Vice Chancellor for Academic Affairs Search Committee Member (2012). UNCW.

Successfully recruited Dr. Denise Battles

Organizing Committee. *Walking Tour of UNCW's Natural Areas*, an Osher Life Long Learning Institute event held for UNCW Chancellor Miller's Installation. One of 6 committee members and tour leaders.

Organizing Committee Member. *Gulf of Mexico Symposium*, UNCW Dept. of Biology and Marine Biology. Public symposium was held at UNCW Spring 2012. Mike Tidwell was the keynote speaker. A discussion followed with an expert panel.

Panel Member. Center for Teaching Excellence round-table discussion on *Teaching Innovation*. Oct. 6, 2011.

Chair's Advisory Committee Member. (2010-2012). UNCW Dept. of Biology & Marine Biology.

Assisted the Department Chair as needed on departmental policies and procedures. Reviewed all faculty annual reports each year.

Hosted and assisted Matt Lau for a campus wide *R Tutorial*, UNCW Center for Teaching Excellence (2011).

Member. *ITSD Search Committee for Academic Research Systems Analyst*. (2011). Reviewed 13 full applications, interviewed 3 candidates.

Mentor. *Honor Scholars Program Cultural Dinner* (2010). Hosted dinner and cultural experience for 7 UNCW freshman.

Orientation Leader. (2010). Spoke with beginning freshman about college life.

Member. *Ad hoc B.S. Marine Biology Curriculum Review Committee*. (2009). This committee met ~5 times during Fall 2009. Our proposed curriculum changes were adopted by the Biology faculty Spring 2010.

Advisor. *University Institutional Effectiveness Committee* (2009). Advised with modeling the university planning process for SACHS review. Facilitated two participatory modeling meetings with university administrators.

Member. *Faculty Search Committee, Coastal Plant Ecologist* (2008–2009). Reviewed ~60 applications and interviewed 4 candidates for the position. I hosted one candidate reception at my home. Successfully hired Dr. Z. Long.

Chairperson. *Faculty Symposium Committee* (2003). Institute of Ecology. Athens, GA.

Graduate Student Representative. *Curriculum Committee* (2002-2004). Institute of Ecology, University of Georgia, Athens, GA.

Graduate Student Representative. *Faculty* (2002-2003). Institute of Ecology. University of Georgia, Athens, GA.

- Organizing Committee Member. *Graduate Student Symposium* (2000-2002), Chairperson 2002.
Institute of Ecology, University of Georgia, Athens, GA.
- Graduate Student Representative. *Quantitative Ecologist Search Committee* (2000-2001). Institute of Ecology, University of Georgia, Athens, GA.
- Graduate Student Representative. *Computer Oversight Committee* (1999-2001). Institute of Ecology, University of Georgia, Athens, GA.

ADDITIONAL PROFESSIONAL ACTIVITIES

Invited Workshop & Conference Participation

- 2010 *Workshop on Complex Networks*. Statistical and Applied Mathematical Sciences Institute. Research Triangle, NC.
- 2009 *Investigative Workshop: New Soil Black Box Math Strategies*. NIMBioS, Knoxville, TN.
- 2008 *University of Georgia Ecological Network Analysis Conference*, Athens, GA.
- 2005 *Annual International Meeting, Institute of Biological Engineering*. Athens, GA.
- 2005 *University of Georgia Ecological Network Analysis Conference*, Athens, GA.
- 2004 *Ecosystem Complexity Workshop*, Fourth European Conference on Ecological Modelling, Bled, Slovenia.
- 2004 *Microbiological Networks*, NSF FIBR Workshop, Athens, GA.
- 2002 *Network Analysis Workshop*, Long Term Ecological Research Program, Sevilleta, NM.
- 2001 *Vulnerability of Water Quality in Intensively Developing Watersheds*. Warnell School of Forest Resources, University of Georgia, Athens, GA.
- 2001 *Foresight for Lanier: A Workshop*. Gainesville, GA. Co-organizers: G.M. Cowie, M.B. Beck, O.O. Osidile, A.K. Parker, S.R. Borrett.

Continuing Education

- 2011-present Center for Teaching Excellence (CTE) Book Circles, UNCW.
- 2013 "Creating and Delivering Powerful Lectures", UNCW CTE, April 2.
- 2012 Mentoring Camp. UNCW CTE. Focus on faculty mentoring programs for departments, colleges, and whole university.
- 2012 "4 Easy Steps to Preparing Proposal Submissions for Courses to be Included in a Cluster", UNCW CTE, February 7, 2012.
- 2011 "Balancing work/life issues in a demanding environment", UNCW CTE, April 13.
- 2011 "UNCW Learning Goals Series: Teaching and Assessing Information Literacy", UNCW CTE, March 10.
- 2010 How to prepare ecological data sets for effective analysis and sharing. Workshop at 95th Annual Meeting, Ecological Society of America. Pittsburgh, PA. Organized by: Robert Cook, Viv Huthchinson, Stephanie Hampton, and Tammy Beaty.
- 2007-2011 Attended 13 workshops at the UNCW Center for Teaching excellence including "Taming Large Lectures", "Promoting an Undergraduate Research Culture", and "Best Practices in Advising".
- 2007 Teaching for Understanding in Science: Building Learner-Centered Classrooms. Workshop at UNCW led by D. Ebert-May.

- 2006 Innovative teaching and active learning in the biological sciences. Workshop at 91st Annual Meeting, Ecological Society of America. Memphis, TN. Organized by: D. Ebert-May, J. Batzli, and D. Luckie.
- 2004 An overview of structural equation modeling and path analysis. Workshop at 89th Annual Meeting, Ecological Society of America. Portland, OR. Organized by: J.B. Grace and S.M. Scheiner
- 2003 Twenty-five years of ecological chaos: Do mathematical models really work after all?. Workshop at 88nd Annual Meeting, Ecological Society of America. Tucson, AZ. Organized by: R.F. Costantino and W.M. Schaffer

Society Memberships

Ecological Society of America, International Society for Ecological Modelling, Society for Mathematical Biology, Systems Dynamics Society.