

# Melissa A. Kenney

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## I. Education

**Duke University**, Nicholas School of the Environment and Earth Sciences, Durham, NC.

**Ph.D. Candidate** in Water Quality Modeling and Decision Analysis. May 2007.

Dissertation title: *Which nutrient criteria should States and Tribes choose to determine waterbody impairment?: Using science and judgments to inform decision-making.*

Committee members: Kenneth H. Reckhow (advisor), Robert T. Clemen, Ralph L. Keeney, and Craig A. Stow.

**University of Virginia**, Charlottesville, VA.

**B.A. with Distinction** in Environmental Sciences. May 2002.

Thesis title: *Development of a Value-Based Model to Provide Options for Reuse of Superfund Sites.*

Thesis Advisors: Janet S. Herman and Mark A. White

## II. Research Interests

Water quality modeling, decision analysis, environmental public policy, statistical models, subjective judgments

## III. Publications

### A. Refereed Publications

1. Arhonditsis, G.B., C.A. Stow, L.J. Steinberg, **M.A. Kenney**, R.C. Lathrop, S.J. McBride, and K.H. Reckhow. (2006) Exploring Ecological Patterns with Structural Equation Modeling and Bayesian Analysis. *Ecological Modelling*. 192: 385-409.
2. Reckhow, K.H., G.B. Arhonditsis, **M.A. Kenney**, L. Hauser, J. Tribo, C. Wu, L.J. Steinberg, C. A. Stow, S. J. McBride. (2005) A Predictive Approach to Nutrient Criteria. *Environmental Science and Technology*. 39(9): 2913-2919.

### B. Book Chapters, Reports, and Unrefereed Publications

3. **Kenney, M.A.** and M.A. White. (in press) A Benefit-Cost Model for Evaluating Remediation Alternatives at Superfund Sites Incorporating the Value of Ecosystem Services. Reclaiming the Land: Rethinking Superfund Institutions, Methods, and Practices. G. Macey and J. Cannon, eds.
4. **Kenney, M.A.**, K.H. Reckhow, and G.B. Arhonditsis (2007) Evaluating Eutrophication-Related Water Quality Parameters in North Carolina Lakes and Reservoirs. North Carolina Department of Environment and Natural Resources, Division of Water Quality. Report. pp. 102.
5. Sutton-Grier, A.E. and **M.A. Kenney**. (2005) Recruiters and Academia: A Class Act. *Nature*. 436: 886.
6. Reckhow, K.H., G.B. Arhonditsis, **M.A. Kenney**, S. J. McBride, R.J. Gosnell, C.A. Stow, and H.W. Paerl. (2006) Water Quality Indicators: Nutrient Impacts on Chlorophyll or Algae Species Composition. Water Environment Research Federation. Report 02-ECO-1. pp. 79.
7. **Kenney, M.A.** (2003) Development of Teaching Assistant Support Materials and Training Workshop for the Nicholas School of the Environment and Earth Sciences. Duke University Center for Teaching, Learning, and Writing. Report. pp. 4.
8. **Kenney, M.A.** (2002) Development of a Value-Based Model to Provide Options for Reuse of Superfund Sites. University of Virginia Department of Environmental Sciences Distinguished Majors Program Thesis.

### C. Publications (submitted)

9. **Kenney, M.A.** (submitted and accepted) Making the Most of your Teaching Assistantship (TA) Experience. *Frontiers in Ecology and the Environment*.

## IV. Grants Received (total = \$59,450)

1. **Kenney, M.A.** (2006-2007) Which Nutrient Criteria Should States and Tribes Choose to Determine Water Body Impairment? Using Science and Judgment to Inform Decision-Making. Funding from National Water Resources Institute. Awarded \$10,000.
2. **Kenney, M.A.**, K.H. Reckhow, and G.B. Arhonditsis. (2005-2006) Evaluating Eutrophication-Related Water Quality Parameters in North Carolina Lakes and Reservoirs. Funding from North Carolina Department of Environment and Natural Resources, Division of Water Quality. Awarded \$45,000.
3. **Kenney, M.A.** (2007) FORWARD (Focus on Reaching Women for Academics, Research, and Development) to Professorship. Funding from National Science Foundation ADVANCE leadership award. Awarded \$350.
4. **Kenney, M.A.** (2003-2004) Development of Teaching Assistant Support Materials and Training Workshop for the Nicholas School of the Environment and Earth Sciences. Funding from Duke University Center for Teaching, Learning, and Writing. Awarded \$2,000.
5. **Kenney, M.A.** (2006) Conference Travel Grant Award. Funding from North American Lake Management Society (NALMS). Awarded \$800.
6. **Kenney, M.A.** (2006) Conference Travel Grant Award. Funding from Decision Analysis Society, Institute for Operations Research & the Management Sciences (INFORMS). Awarded \$200.
7. **Kenney, M.A.** (2006) Conference Travel Grant Award. Funding from Duke University Graduate School. Awarded \$500.
8. **Kenney, M.A.** (2006) Conference Travel Grant Award. Funding from Duke University Nicholas School of the Environment and Earth Sciences. Awarded \$300.
9. **Kenney, M.A.** (2004) Conference Travel Grant Award. Funding from Duke University Nicholas School of the Environment and Earth Sciences. Awarded \$300.

## V. Presentations

### A. Invited Presentations and Keynote Addresses

1. **Kenney, M.A.** and R.T. Clemen. (2006) Combining Expert Judgment using Structural Equation Models. Invited presentation in Decision Analysis at Institute for Operations Research & the Management Sciences. Pittsburgh, PA.
2. **Kenney, M.A.** (2006) North Carolina Nutrient Criteria and the Reservoir Protection Act. Invited keynote speaker for the North Carolina Water Resources Association. Raleigh, NC.
3. **Kenney, M.A.** (2005) What are my responsibilities? Questions to ask the lecturing professor about your Teaching Assistantship. Invited panelist for Duke University Teaching IDEAS "TA Survival Skills" workshop.
4. **Kenney, M.A.** (1997) Best Management Practices Installed for Stream-Bank Restoration at Cooks Creek. Invited presentation at the Virginia Environmental Education Conference. Bridgewater, VA.

### B. Presentations

5. **Kenney, M.A.**, K.H. Reckhow, C.A. Stow and R.T. Clemen. (2006) Selection of water quality variables for nutrient criteria using structural equation modeling. Presented at North American Lake Management Society Conference. Indianapolis, IN.
6. **Kenney, M.A.**, K.H. Reckhow, C.A. Stow and R.T. Clemen. (2006) Selection of water quality variables for nutrient criteria using structural equation modeling. Presented and Presided at Ecological Society of America Conference. Memphis, TN.
7. **Kenney, M.A.**, K.H. Reckhow, G.B. Arhonditsis, and S.J. McBride. (2005) Method to develop predictive eutrophication criteria for lakes and reservoirs. Presented at Virginia Lakes and Watersheds Association Conference. Virginia Beach, VA.
8. **Kenney, M.A.** and K.H. Reckhow. (2004) Predictive Approach to Nutrient Criteria. Presented at American Water Resources Association Conference. Orlando, FL.
9. **Kenney, M.A.**, M. A. White, and J.S. Herman. (2003) Use of a value-based model to assess residential and ecological reuse of Superfund Sites. Presented at Virginia Lakes and Watersheds Association Conference. Virginia Beach, VA.

10. White, M.A., **M.A. Kenney**, and J.S. Herman, (2003) Use of a value-based model to assess residential and ecological reuse of Superfund sites, Presented at Technische Universität Dresden. Dresden, Germany.
11. **Kenney, M.A.** (2002) Development of a Value-Based Development of a Value-Based Model to Provide Options for Model to Provide Options for Reuse of Superfund Sites Reuse of Superfund Sites. **Best Undergraduate Presentation**, University of Virginia Environmental Sciences Research Symposium.

## C. Poster Presentations

12. **Kenney, M.A.**, K.H. Reckhow, and R.T. Clemen. (2006) Results of the North Carolina Lake User Survey. Poster presented at Water Resources Research Institute Conference. Raleigh, NC. **Received 3<sup>rd</sup> place**, best poster contest.
13. **Kenney, M.A.**, K.H. Reckhow, G.B. Arhonditsis, and S.J. McBride. (2005) Selecting Appropriate Eutrophication Criteria Using Structural Equation Modeling. Poster presented at Water Resources Research Institute Conference. Raleigh, NC.
14. **Kenney, M.A.**, K.H. Reckhow, G.B. Arhonditsis, and S.J. McBride. (2004) Selecting Appropriate Eutrophication Criteria Using Structural Equation Modeling. Poster presented at Statistical and Applied Mathematical Sciences Institute. Research Triangle Park, NC.

## VI. Reviews for Scientific Journals

- Environmental and Ecological Statistics (1)
- Academy of Management, Organizations & the Natural Environment (4)

## VII. Articles Featuring My Research, Activities, and Service

1. Webb, S. (2006) Decision Analysis Meets Environmental Policy. ScienceCareers by Science. Issue: June 30, 2006.
2. Featured in Sigma Xi, the Scientific Research Society. (2006) Making a Difference in Science & Engineering. DVD. Distributed by Sigma Xi.
3. Featured in Kaplan, Ben. (2003) The Scholarship Scouting Report: An Insider's Guide to America's Best Scholarships. HarperResource: New York. p.193-201.

## VII. Awards, Honors, and Scholarships

- **National Water Resources Institute Fellowship (\$10,000; 2006)**
- **Morris K. Udall Scholar for Environmental Policy and Leadership (\$5000; 2001)**
- **Center for Teaching Learning and Writing Fellow (\$2000; 2003 – 2004)**
- Honorable Mention in National Science Foundation Graduate Research Fellowship (2004)
- National Winner of FFA Soil and Water Management Proficiency Award (\$500; 1999)
- University of Virginia Environmental Sciences Department Chair's Award (\$100; 2000)
- University of Virginia Environmental Sciences Distinguished Majors Program (2001-2002)
- American FFA Degree (2001)
- Bronze Rating in National FFA Environmental Science Proficiency Award (1998)
- Virginia Lakes and Watersheds Association Scholarship (\$1000; 2001)
- Varsity Books Scholarship (\$5000; 2000)
- Virginia Association of Soil and Water Conservation Districts Scholarship (\$1000; 1998)

## VIII. Research Experience

### **Water Quality Modeling and Decision Analysis**, Duke University (2004 – present)

*Research Assistant*: Conducted research on setting nutrient criteria explicitly linked to the water quality goal. Developed method using structural equation models and multiattribute utility analysis. Applied method to North Carolina. Designed and successfully executed lake user survey. Created data collection protocol for expert elicitations.

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## **Total Maximum Daily Load (TMDL) Modeling**, Duke University (Summer 2003)

Research Assistant: Conducted literature review and wrote report on fecal coliform and total maximum daily load. Organized data, began exploratory data analysis, and created preliminary model structure.

## **Independent Consulting**, Parsons Engineering Science, Inc., (Spring 2004)

Water Quality Consultant: Provided synopsis of eutrophication research for quantitative analysis and support for measurable predictive water quality criteria. Placed special emphasis on attainment of the designated use. Traveled with contractors to present at a workshop and offer expertise on establishing state nutrient criteria.

## **Center of Expertise for Superfund Site Recycling**, Environmental Protection Agency and University of Virginia (2001 –2002)

Research Assistant: Worked with multidisciplinary team that included scientists, engineers, commerce, law, architecture, and conflict resolution scholars to determine key parameters leading to reuse of Superfund sites. Published research on a cost-benefit model developed to evaluate both optimal remediation strategies and site reuse alternatives.

## **Shenandoah Watershed Study**, University of Virginia (2000 – 2001)

Research Assistant / Field Research Manager: Collected samples in the Shenandoah National Park to assess the impact of air pollution (acid deposition) on water quality of low order streams. Analyzed data collected using principle component analysis and discovered possible explanations relationships between correlated factors.

## IX. Teaching Experience

### **Duke University Women's Studies and Nicholas School of the Environment and Earth Sciences** (2005)

Instructor: Co-designed and co-taught an interdisciplinary course on Gender and the Environment (entitled Feminism & Ecology) with Ariana Sutton-Grier. Experimented with active learning techniques, such as discussions, role-plays, and small-group activities. Received excellent evaluations from students.

### **Teaching Assistantship Coordinator, Center for Teaching Learning and Writing** (2003 – 2004)

CTLW Fellow: Developed manual and training workshop to provide incoming graduate students with fundamental information for their teaching assistantship. Provided support for professional development. Following the initial development of these support materials, the Nicholas School of the Environment and Earth Sciences has created a permanent position for a graduate student to update material to improve the pedagogic training provided to the incoming graduate students and first-time teaching assistants.

### **Duke University Nicholas School of the Environment and Earth Sciences** (2005 – present)

#### Guest Lecturer:

- Water Quality Assessment
- Water Quality Management
- Applied Regression Analysis
- Applied Statistics for Environmental Sciences

### **Duke University Nicholas School of the Environment and Earth Sciences** (2002 – 2005)

#### Teaching Assistant:

- Applied Regression Analysis
- Water Quality Assessment
- Water Quality Management
- Water Quality Modeling
- Integrating Environmental Science and Policy
- Introduction to Environmental Science and Policy

Teaching responsibilities included: teaching statistical laboratories, lecturing, leading discussion, developing course materials, assisting with field trips, organizing classroom logistics, and grading policy memos, problem sets, projects, and exams. Contributed to the development and teaching of a new graduate level course. Received excellent evaluations from students.

*References, portfolio, and writing samples available upon request.*

## **Virginia Governor's Schools** (Summer 1999, 2001 – 2005)

Environmental Educator: Taught gifted high school students about environmental problems in the Chesapeake Bay Watershed and possible solutions. Lead discussions on environmental decision-making. Featured in articles because of hands-on approach to learning.

## **University of Virginia Recycling Office** (1998 – 1999)

Environmental Educator: Solely responsible for educating freshmen about campus recycling. Coordinated recycling programs and made presentations. Key player in instituting recycling on the Lawn (historical center of campus). Recognized with the Outstanding Employee Award.

## **Rockingham County Schools** (Summer 1999)

Assistant Teacher: Taught remedial mathematics, reading, and writing to elementary students.

## X. Undergraduate and Graduate Student Research Projects Mentored

1. Banjoko, Modupe. (2006) Comparing the results of different ways to generate model hypotheses using discovery method and confirmatory/exploratory method. North Carolina Central University. Undergraduate Thesis in Mathematics and Computer Science.
2. Xiao, Zengtao. (2005) Using MVE and MCD Robust Covariance Matrices in Path Analysis: A Case Study of Lake Washington. North Carolina Central University. Master of Science Thesis in Mathematics.
3. Barkley, Matthew. (2005) Statistical Modeling Assessment of Western North Carolina Lakes. Duke University. Masters of Environmental Management Project.
4. Caldwell, Linda. (2005) A Predictive Framework of Designated Use Attainment: An Application of Nutrient Criteria Selection for Florida Lakes. Duke University. Masters of Environmental Management Project.
5. Estes, Emily. (2005) Statistical Analysis of Water Quality Criteria and Designated Use Attainment for 125 Finnish Lakes. Duke University. Masters of Environmental Management Project.
6. Elcock, Karen. (2004) A Statistical Modeling Assessment of the National Nutrient Criteria: Lake Mendota. Duke University. Masters of Environmental Management Project.
7. Hauser, Lauren. (2004) Water Quality Indicators: Nutrient Impacts on Designated Use Attainment in Lake Washington. Duke University. Masters of Environmental Management Project.
8. Tribo, Jennifer. (2004) A Statistical Modeling Assessment of the National Nutrient Criteria in South San Francisco Bay. Duke University. Masters of Environmental Management Project.
9. Wu, Christopher. (2004) A Statistical Modeling Assessment of the National Nutrient Criteria in the Neuse River Estuary. Duke University. Masters of Environmental Management Project.

## XI. Activities

- Preparing Future Faculty, Fellow (2003 – 2004)
- Duke University Nicholas School of the Environment and Earth Sciences Ph.D. Advisory Committee, Chairperson (2003, 2005 – 2006)
- Duke University Consortium in Scholarship of Teaching and Learning (2005 – present)
- Duke University Graduate and Professional Women's Network (2002 – present)
- Duke University Women in Science and Engineering (2002 – present)
- Duke University Commencement Committee (2006)
- Duke University Graduate Student Ballroom Dance Club (2004 – present)
- University of Virginia Alumni (TriangleHoos) Education and Outreach Committee (2005 – 2006)
- WUNC, National Public Radio Volunteer (2003 – present)
- Expanding your Horizons, program to encourage middle school girls in math and science (2005)
- Pathways to the Professoriate (2003)
- Duke University Chapel Choir (2002)
- University of Virginia Environmental Sciences Organization, President (1998 – 2002)
- University of Virginia Singers (1999 – 2002)
- Charlottesville Environmental Education Program, Program Director (2000 – 2002)

## XII. Professional Organizations, Membership

- Sigma Xi, the Scientific Research Society (2005 – present)
  - National Committee on Nominations (2006 – 2009)
  - Duke University Chapter of Sigma Xi, President (2005 – present)
- American Association for the Advancement of Science (AAAS) (2005 – present)
- Institute for Operations Research & the Management Sciences (INFORMS) (2005 – present)
- Ecological Society of America (ESA) (2006 – present)
- American Water Resources Association (AWRA) (2003 – present)
- North American Lakes Management Society (NALMS) (2003 – present)
- North Carolina Water Resources Association (NCWRA) (2005 – present)
- Virginia Lakes and Watersheds Association (VLWA) (2002 – present)