Michelle L. Davis

Dept. of Fisheries and Wildlife Sciences
349 Latham Hall
Virginia Tech
Blacksburg, VA 24061-0321

Telephone: (540) 231-1424
Fax: (540) 231-7580
Email: midavis1@vt.edu
http://filebox.vt.edu/users/midavis1/index.htm

Education:

- Ph.D., Virginia Polytechnic Institute and State University (2006-present)
  - Major: Fisheries Science
  - Dissertation: Incorporating protogyny into stock assessment and management
  - Advisor: Dr. Brian R. Murphy
- M.S., Virginia Polytechnic Institute and State University (2003)
  - Major: Fisheries Science
  - Thesis: Assessment of the South Atlantic red porgy (*Pagrus pagrus*) population under a moratorium
  - Advisor: Dr. Jim Berkson
- B.S., Auburn University (1999)
  - Major: Zoology; graduated with honors
- B.S., Auburn University (1999)
  - Major: Marine Biology; graduated with honors
  - Attended Shoals Marine Laboratory (Cornell University)

Honors and Awards:

- Sustainability Ideas Competition: 2nd Place Award. Virginia Tech Committee for Energy and Sustainability (2007)
- American Fisheries Society Certification: Associate Fisheries Professional (2007)
- Southeast Association of Fish and Wildlife Agencies Annual Meeting, Best Student Presentation (2006)
- American Fisheries Society Skinner Memorial Award Honorable Mention (2003)
- American Fisheries Society Marine Fisheries Section Student Award (2003)
- American Fisheries Society Equal Opportunity Section Student Award (2003)
- National Merit Scholar (1995)
- Howard Hughes Future Life Science Scholar Fellowship (1995-1999)
- Auburn University President's Scholar Scholarship (1995-1999)

Professional Development:

- Member of the joint horseshoe crab-shorebird population assessment working group, through Atlantic States Marine Fisheries Commission (2007-present)
- Member of Horseshoe Crab Stock Assessment Subcommittee of the Atlantic States Marine Fisheries Commission (2005-present)

- South Atlantic Fishery Management Council and National Marine Fisheries Service Southeast Data, Assessment, and Review (SEDAR) process participant. Participated in data review meetings, stock assessment model development meetings, stock assessment review meetings, and presentation to the Council.
    - SEDAR-I (2002) for red porgy
    - SEDAR-II (2002-2003) for vermilion snapper and black seabass
- Member of American Fisheries Society: Marine Fisheries Section and Education Section

Teaching Experience:

Visual Basic Programming for Natural Resource Scientists (FIW 5984, 2 credits, 2007)

- Description: Custom-designed computer programs are often useful tools in the natural resource sciences. In this course, graduate students with little or no computer programming experience learned both the logic and syntax of writing programs. I employed a problem-based approach to teaching, using in-class exercises, homework assignments, and class projects all based on real-world situations in which a program could be beneficial. These assignments and projects required students to think critically, solve problems, and be creative.
- Involvement: designed syllabus; developed all handouts, in-class exercises, homework assignment, group projects, and online course management information; presented course materials and facilitated discussion; graded assignments and projects; assigned final grades
- Overall student rating (4.0 scale): 3.93

Web Page Design (1 class period of FIW 5004 Graduate Seminar, 2007)

- Description: As part of the department's graduate requirements, graduate students are required to create a webpage explaining their research project, so I helped them navigate the web design process. I used in-class exercises in which the students learned basic web design techniques and made significant progress towards completing their own web pages.
- Involvement: designed lesson plan; developed handout and in-class exercises; presented course materials; helped students design and post web pages after course was over

Aquatics Biomonitoring (1 class period of NR 1114 Introduction to Renewable Natural Resources, 2007)

- Description: As part of the college's introduction to the various natural resource majors, students participate in field and lab experiences that are representative of each major. I led a lab section of aquatics biomonitoring, where students sampled the invertebrate community of a stream in order to estimate the "health" of the stream.
- Involvement: presented course materials and facilitated the discussion of lab findings

Other Pedagogical Experiences:

- Panel member: Life in Academe for Future Faculty: Disciplinary Courses in Teaching and Learning, presented by Center for Excellence in Undergraduate Teaching, Virginia Tech, 2007

- Attended Center for Excellence in Undergraduate Teaching (Virginia Tech) workshops:
  - Cooperative Learning, 2008
  - Writing Case Studies and Case Teaching Notes, 2008
  - Case Study Types and Teaching Methods that Reach your Learning Goals, 2008
  - Introduction to Case Study Pedagogy, 2008
  - Team-Based Learning: a Transformative Use of Small Groups, 2008
  - Teaching Excellence at a Research-Centered University, 2007
  - Engaging Students: Active and Cooperative Learning, 2006
- Completed courses related to pedagogy:
  - Contemporary Pedagogy, 2007
  - Graduate Teaching Assistant Training Workshop, 2007
  - Pedagogy for the Natural Resource Scientist, 2006

Research Experience:

Fisheries Extension Associate, Virginia Cooperative Extension, Virginia Tech, 2007-present.
I work extensively with citizens, planners, local decision makers, non-governmental organizations, and agencies to incorporate considerations for fisheries and aquatic resources into land-use and water-use plans and decisions. I assist extension agents in the development and delivery of research-based information related to fisheries, land, and water resources education.

Ph. D. Candidate, Department of Fisheries and Wildlife Sciences, Virginia Tech, 2006-present.
Commercial harvest of fishes often removes the largest, most productive individuals from the population. For species that change sex during their lifetimes, harvest may selectively remove one sex, possibly affecting population productivity. I am currently working on a project to investigate ways to incorporate the effects of protogyny (female to male sex transition) into stock assessments and management of reef fishes, particularly red porgy and black sea bass.

Research Associate**,** Department of Fisheries and Wildlife Sciences, Virginia Tech, 2003-present.
Current projects: I am conducting population modeling and simulation studies on black sea bass and red porgy to identify methods to incorporate protogyny into stock assessment and management. In another project, I am evaluating grass carp movement patterns, growth, and consumption rates to develop bioenergetics models to predict optimum stocking densities, locations, and frequencies, with the goal of controlling hydrilla in Lake Gaston, NC. Additionally, I am working with a team of researchers to develop an assessment model that links population dynamics of horseshoe crabs in the Delaware Bay with population dynamics of migrating shorebirds that feed on horseshoe crab eggs, including red knot.

Past research projects: Evaluated use of the fisheries-based technique of cohort analysis for harvested terrestrial wildlife populations. Developed the first regional-scale stock assessment models for horseshoe crabs on the Atlantic coast, incorporating data from a wide range of fishery-independent and fishery-dependent sources. Evaluated effects of timber

harvest and disturbance on small mammal communities. Designed and taught graduate-level course: Visual Basic programming for natural resource scientists. Prepared journal manuscripts and final reports; presented results to management agencies and at scientific meetings.

Graduate Research Assistant, Department of Fisheries and Wildlife Sciences, Virginia Tech, 2001-2003.

Used stock assessment models to investigate how data loss during a moratorium or sampling change affected stock assessment of red porgy and other south Atlantic reef fishes. Worked closely with the South Atlantic Fisheries Management Council and the National Marine Fisheries Service. Participated in two SEDAR stock assessment workshops. Defended thesis entitled "Assessment of the South Atlantic Red Porgy (Pagrus pagrus) Population Under a Moratorium" in December 2003. Presented results to South Atlantic Fisheries Management Council and published article in Fishery Bulletin.

Fisheries Technician, Department Fisheries and Allied Aquaculture, Auburn University, 2000. Conducted growth study of young-of-the-year largemouth bass to identify latitudinal effects in condition, growth, and energy allocation. Conducted bioenergetics modeling and field sampling.

Undergraduate Research Assistant, Department of Zoology, Auburn University, 1995-1999. Received Howard Hughes Future Life Science Scholar Fellowship to conduct research on neurobiology, neuroendocrinology, and ecotoxicology. Also conducted research at Savannah River Ecology Lab, SC, and Emory University, GA.

Publications:

1. Davis, M. L., J. Berkson, D. Steffen, and M. K. Tilton. 2007. Evaluation of accuracy and precision of Downing population reconstruction. Journal of Wildlife Management 71: 2297-2303.
2. Kaminski, J. A., M. L. Davis, M. Kelly, and P. D. Keyser. 2007. Disturbance effects on small mammal species in a managed Appalachian forest. American Midland Naturalist 157: 385-397.
3. Davis, M. L., and J. Berkson. 2006. Effects of data loss from a simulated moratorium on the stock assessment of red porgy (*Pagrus pagrus*). Fishery Bulletin 104: 585-592.
4. Davis, M. L., J. Berkson, and M. Kelly. 2006. A production modeling approach to the assessment of the horseshoe crab (*Limulus polyphemus*) population in Delaware Bay. Fishery Bulletin 104: 215-225.
5. Davis, M. L. 2003. Assessment of the South Atlantic red porgy (*Pagrus pagrus*) population under a moratorium. M.S. Thesis. Virginia Polytechnic Institute and State University, Blacksburg, VA.

Publications in Preparation:

1. Murphy, B. R., D. W. Willis, and M. L. Davis. *Case Studies in Fisheries Conservation and Management*. American Fisheries Society.

Funded Grants:

- Incorporating protogyny into stock assessment models (2005)
    - Principal Investigators: B. Murphy, M. Davis, and Y. Jiao
    - Submitted to National Marine Fisheries Service, Marine Fisheries Initiative

Presentations:

Invited:

Davis, M. L. 2006. Horseshoe crab population status. Virginia General Assembly, Agriculture, Chesapeake, and Natural Resources Subcommittee, with regards to Virginia House Bill 435, Section 28.2-203.2, Richmond, VA. Oral presentation.

Davis, M. L., J. Berkson, and M. J. Kelly. 2006. Delaware Bay horseshoe crab population assessment using surplus production models. Atlantic States Marine Fisheries Commission, Horseshoe Crab Stock Assessment Subcommittee, Philadelphia, PA. Oral presentation.

Davis, M. L. 2005. Delaware Bay horseshoe crab population assessment using surplus production models. Atlantic States Marine Fisheries Commission, Horseshoe Crab Technical Committee, Norfolk, VA. Oral presentation.

Davis, M. L. 2003. Assessment of South Atlantic red porgy during a moratorium. South Atlantic Fishery Management Council, St. Simons Island, GA. Oral presentation.

Davis, M. L. 2002. Stock assessment during a moratorium. Invited lecturer for FIW 4714 Fisheries Management, Virginia Tech, Blacksburg, VA. Oral presentation.

Conferences:

Davis, M. L., and B. R. Murphy. 2007. Harvest impacts on population dynamics of sex changing fishes. PICES/ICES Early Career Scientists Conference, Baltimore, MD. Oral presentation.

Davis, M. L., J. Berkson, D. Steffen, and M. K. Tilton. 2006. Evaluating Downing population reconstruction: simulations for black bear and white-tailed deer populations. Annual Meeting of the Southeastern Association of Fish and Wildlife Agencies, Norfolk, VA. Oral presentation. Received Best Student Presentation Award.

Davis, M. L., J. Berkson, and M. J. Kelly. 2005. Delaware Bay horseshoe crab population assessment using surplus production models. Annual Meeting of the American Fisheries Society, Anchorage, AK. Poster presentation.

Davis, M. L., and J. Berkson. 2003. Stock assessment during a moratorium: the role of fishery-independent data in the red porgy assessment. Annual Meeting of the American Fisheries Society, Quebec City, Quebec. Oral presentation.

Davis, M. L., and J. Berkson. 2003. Red porgy population status determination: optimizing data during data-poor periods. Annual Meeting of the Ecological Society of America, Savannah, GA. Poster presentation.

Berkson, J., A. Harrison, and M. Davis. 2003. Will telling students the truth about environmental management scare them away? Annual Meeting of the Ecological Society of America, Savannah, GA. Oral presentation.

Berkson, J., A. Harrison, and M. Davis. 2003. Will telling students the truth about conservation scare them away? Annual Meeting of the Society for Conservation Biology, Duluth, MN. Oral presentation.

Davis, M. L., and J. Berkson. 2002. Using fishery-independent data to assess a stock under moratorium: a case study of red porgy. Annual Meeting of the American Fisheries Society, Baltimore, MD. Poster presentation.

Davis, M. L., M. T. Mendonca, and L. J. Young. 1999. Seasonal differences in oxytocin receptor distribution in the big brown bat. Annual Meeting of the Society for Integrative and Comparative Biology, Denver, CO. Oral presentation.

Davis, M. L., M. T. Mendonca, and L. J. Young. 1998. Seasonal differences in oxytocin distribution in the big brown bat, *Eptesicus fuscus*. Annual Meeting of the Alabama Academy of Science, Mobile, AL. Oral presentation.

Davis, M. L., M. T. Mendonca, and L. J. Young. 1997. Distribution of oxytocin receptors in the brain: a comparison of bats and voles. Annual Meeting of the Alabama Academy of Science, Montgomery, AL. Oral presentation.

Service:

College-Level:

- Member, College of Natural Resources Planning Committee on Engagement (2007-present)

Department-Level:

- Member, Aquatic Extension Specialist Selection Committee, Department of Fisheries and Wildlife Sciences, Virginia Tech (2007-present)
- Member, Graduate Program Review Task Force, Department of Fisheries and Wildlife Sciences, Virginia Tech (2006-present)
- Treasurer, Fisheries and Wildlife Graduate Student Association (2007-present)
- Graduate Student Mentor, Department of Fisheries and Wildlife Sciences, Virginia Tech (2006, 2008)

Professional:

- Member, Joint Horseshoe Crab-Shorebird Population Assessment and Adaptive Resource Management Committee, Atlantic States Marine Fisheries Commission (2007-present)
- Member, Horseshoe Crab Stock Assessment Subcommittee, Atlantic States Marine Fisheries Commission (2005-present)
- Manuscript reviewer:
    - *Fishery Bulletin* (2005, 2007)
    - *Marine and Freshwater Research* (2004)
- Member, Marine Fisheries Section, American Fisheries Society (2001-present)
- Member, Education Section, American Fisheries Society (2000-present)
- Member American Fisheries Society (2000-present)

References:

Dr. Brian R. Murphy, Professor
Dept. Fisheries and Wildlife Sciences
442 Latham Hall
Virginia Tech
Blacksburg, VA 24061-0321
Email: murphybr@vt.edu
Phone: 540-231-6959

Dr. Jim Berkson, Associate Professor
Dept. Fisheries and Wildlife Sciences
114 Cheatham Hall
Virginia Tech
Blacksburg, VA 24061-0321
Email: jberkson@vt.edu
Phone: 540-231-5910