

# Travis O. Brenden, Ph.D.

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## Work Address

Quantitative Fisheries Center  
Department of Fisheries and Wildlife  
Michigan State University  
153 Giltner Hall  
East Lansing, MI 48824-1101

## Education

**Ph.D. - Fisheries & Wildlife Science (2005)**

**Virginia Polytechnic Institute & State University**

Dissertation: Optimizing management of Virginia's New River muskellunge *Esox masquinongy* fishery: modeling habitat use and the impact of alternative harvest regulations

**M.S. - Statistics (2001)**

**Virginia Polytechnic Institute & State University**

Coursework: Exploratory and Robust Data Analysis, Applied Multivariate Analysis, Regression Analysis, Applied Statistics, Probability and Distribution Theory, Inference, Linear Models Theory, Experimental Design, Nonparametric Statistical Methods, Philosophy and Methodology of Statistical Inference and Modeling

**M.S. - Fisheries & Wildlife Science (1999)**

**Virginia Polytechnic Institute & State University**

Thesis: Competition Between Age-0 Largemouth Bass and Juvenile Bluegills in a Virginia Pond

**B.S. - Biological Sciences (1996)**

**South Dakota State University**

Major: Wildlife and Fisheries Science      Minor: Criminal Justice

## Professional Experience

**Research Assistant Professor/Associate Director, Quantitative Fisheries Center, Department of Fisheries and Wildlife, Michigan State University, East Lansing, Michigan (2/2006 – present)**

- Appointment: 30% Research, 30% Administrative, 20% Outreach, 20% Teaching
- Responsible for day-to-day administration of the QFC, including staff supervision, point-of-contact for QFC contributing partners, and coordination of QFC courses/workshops and research activities
- Conduct and direct research on the ecology and population dynamics of managed fish populations in the Great Lakes

**Research Associate II, School of Natural Resources and Environment, University of Michigan, Ann Arbor, Michigan (3/2004 – 1/2006)**

- Collaborated on an EPA Star Grant project entitled "Development of watershed classification systems for diagnosing of biological impairment in watersheds"
- Developed and programmed a spatially-constrained clustering procedure for delineation of ecological valley segments through digital GIS river networks
- Collaborated in the development of a GIS data model for analyzing multi-scale landscape variables across spatially extensive areas for river conservation and management
- Developed a stream classification system for delineated river segments

**Graduate Research Assistant, Virginia Polytechnic Institute & State University, Blacksburg, Virginia (1/1997 – 12/2003)**

- Conducted dissertation research examining the effect of alternative harvest regulations on the New River muskellunge fishery and modeling muskellunge habitat selection through telemetry and hydroacoustic sampling of habitat availability
- Conducted thesis research examining competitive effects between age-0 largemouth bass and juvenile bluegills

## **Teaching Experience**

### **Michigan State University**

- Introduction to AD Model Builder (Short Course – Instructor)
- Resampling Approaches to Data Analysis in Natural Resources and Ecology (Center for Statistical Training and Consulting Workshop – Instructor)
- Resampling Approaches to Data Analysis in Natural Resources and Ecology (Online Course – Course Developer)
- Maximum Likelihood Estimation for Natural Resources and Ecology (Online Course – Course Maintainer)
- Landscape Ecology (Guest Lecturer)

### **Virginia Polytechnic Institute and State University**

- Graduate Seminar: Statistical Issues in Fisheries & Wildlife Sciences (Instructor)
- Fisheries Techniques (Instructor/Guest Lecturer/Teaching Assistant)
- Fisheries Management (Instructor/Teaching Assistant)
- Introduction to Renewable Natural Resources (Instructor/Teaching Assistant)
- Principles of Fisheries and Wildlife Management (Teaching Assistant)
- Ichthyology (Guest Lecturer/Teaching Assistant)

## **Professional Development and Service**

- Attended two short-courses on the use of AD Model Builder software entitled “AD Model Builder Basics” and “AD Model Builder Advanced Fishery Applications” taught by Dr. Jim Bence and Brian Linton in East Lansing, MI (June 2006)
- Attended workshop entitled “Regression Modeling Strategies” taught by Dr. Frank Harrell and sponsored by the American Statistical Association in East Lansing, MI (May 2006)
- Attended workshop entitled “Mixed Modeling Smoothing: From Theory to Applications with SAS Software” taught by Dr. Oliver Schabenberger in East Lansing, MI (April 2006)
- Attended workshop entitled “Applied Structural Equation Modeling” taught by the University of Michigan Center for Statistical Consultation and Research in Ann Arbor, MI (November 2004)
- Attended continuing education workshop entitled “Tagging Models: Estimating Population Size and Mortality” taught by Dr. Ken Pollock, Dr. Joe Hightower, and Bill Pine at the 2003 AFS Southern Division Spring Meeting in Wilmington, NC (February 2003)
- Manuscript peer review for *Environmental Management, Environmental Modelling and Software, Fisheries Management and Ecology, Journal of Fish Biology, North American Journal of Fisheries Management, Proceedings of the Annual Conference Southeastern Association of Fish and Wildlife Agencies, Transactions of the American Fisheries Society*
- Book chapter peer review for *Influences of Landscapes on Stream Habitats and Biological Assemblages, 4<sup>th</sup> International Reservoir Symposium*

## **Awards, Honors, Certifications**

- Associate Fisheries Professional, American Fisheries Society (2003)
- Georgia-Pacific Endowed Dean’s Graduate Fellowship, College of Natural Resources, Virginia Tech (2001)
- Burd McGinnes Fellowship, Department of Fisheries & Wildlife Sciences, Virginia Tech (2000, 2003)
- Graduate Student Service Award, Virginia Tech (1999)
- Best Student Paper Award, Honorable Mention (1999) - Virginia - North Carolina Joint AFS Meeting
- Member-of-the-Year Award, Virginia Tech Chapter of the American Fisheries Society (1997-1998)
- Graduated “With Highest Honors” from South Dakota State University (1996)
- South Dakota Conservation Officer’s Association Scholarship, South Dakota State University (1996)
- Wilbur Allen Scholarship, South Dakota State University (Spring & Fall 1995, Spring & Fall 1996)

### Grants Received

- Brenden, T.O.**, and J. He. 2007. Coordination workshops concerning lake trout age-1 mortality in the Great Lakes. Funding Source: Great Lakes Fishery Commission, Amount: \$8,746.
- Brenden, T.O.**, J.R. Bence, and M.J. Jones. 2007. Development of an on-line course on resampling approaches to data analysis in natural resource sciences and an on-line module for data simulation and resampling programming using Microsoft Excel VBA. Funding Source: Michigan State University Graduate School, Amount: \$40,000.
- Bence, J.R., and **T.O. Brenden**. 2006. Estimating the relationship between sea lamprey-induced mortality on lake trout and observed marking rates. Funding Source: Great Lakes Fishery Commission, Amount: \$36,296.
- Wiley, M.J., C. Riseng, **T.O. Brenden**, L. Wang, E.S. Rutherford, and P.W. Webb. 2005. Evaluation and synthesis of methods for identifying and quantifying critical fisheries habitat for Great Lakes lower riverine and nearshore zones. Funding Source: Great Lakes Fishery Trust, Amount: \$94,631.
- Murphy, B.R., **T.O. Brenden**, and E.M. Hallerman. 2001. Assessment of Virginia's management of riverine muskellunge fisheries. Funding Source: Virginia Department of Game and Inland Fisheries, Amount: \$54,436.

### Manuscripts/Reports in Preparation

- Brenden, T.O.**, M.P. Ebener, K. Reid, and T.J. Newcomb. In prep. Great Lakes commercial fisheries: historical overview and prognosis for the future. *In* W.W. Taylor and N. Leonard, editors. Great Lakes fisheries policy and management: a binational perspective, 2<sup>nd</sup> edition.
- Wagner, T., M.L. Jones, M.P. Ebener, M.T. Arts, M. Faisal, **T.O. Brenden**, D. Honeyfield, and G. Wright. In prep. Spatial and temporal dynamics of lake whitefish health measures: linking individual-based indicators to a management-relevant endpoint. Target Journal: Journal of Great Lakes Research
- Ebener, M.P., **T.O. Brenden**, and M.L. Jones. In prep. Estimates of fishing and natural mortality rates for four lake whitefish stocks in northern lakes Huron and Michigan. Target Journal: Journal of Great Lakes Research
- Brenden, T.O.**, M.L. Jones, and M. Ebener. In prep. Sensitivity of tag recovery mortality estimates to tag shedding, handling mortality, and reporting rate inaccuracies. Target Journal: Journal of Great Lakes Research
- Wehrly, K.E., **T.O. Brenden**, and L. Wang. Under review. A comparison of statistical approaches for predicting regional stream temperatures from landscape features. Target Journal: Journal of the American Water Resources Association

### Published Manuscripts/Reports

- Brenden, T.O.**, L. Wang, and P.W. Seelbach. In press. A river valley segment classification of Michigan streams based on fish and physical attributes. Transactions of the American Fisheries Society
- Brenden, T.O.**, T. Wagner, and B.R. Murphy. In press. Novel tools for analyzing proportional size distribution (PSD) index data. North American Journal of Fisheries Management
- Brenden, T.O.**, L. Wang, and Z. Shu. 2008. Quantitative identification of disturbance thresholds in support of aquatic resource management. Environmental Management 42: xxx-xxx.
- Wagner, T., M.E. Benbow, **T.O. Brenden**, J. Qi, and R.C. Johnson. 2008. *Buruli ulcer* disease prevalence in Benin, West Africa: associations with land use/cover and the identification of disease clusters. International Journal of Health Geographics 7:25. (Available at <http://www.ij-healthgeographics.com/content/7/1/25>)
- Brenden, T.O.**, and J.R. Bence. 2008. Comment: use of piecewise regression models to estimate changing relationships in fisheries. North American Journal of Fisheries Management 28: 844-846.

- Jones, M.L., M.P. Ebener, M.T. Arts, M. Faisal, T. Wagner, **T.O. Brenden**, D. Honeyfield, and G. Wright. 2008. Magnitude and potential causes of mortality in four lake whitefish populations in Lakes Michigan and Huron: a multidisciplinary approach. Great Lakes Fishery Trust, Project Completion Report, Lansing, Michigan.
- Riseng, C., L. Wang, M. Wiley, E. Rutherford, and **T. Brenden**. 2008. State-of-the-art approaches for assessment of Great Lakes nearshore and large river fish habitat. Great Lakes Fishery Trust, Project Completion Report. Lansing, Michigan.
- Wang, L., **T. Brenden**, P. Seelbach, A. Cooper, D. Allan, R. Clark, Jr., and M. Wiley. 2008. Landscape based identification of human disturbance gradients and reference conditions for Michigan streams. *Environmental Monitoring and Assessment* 141:1-17.
- Brenden, T.O.**, L. Wang, P.W. Seelbach, R.D. Clark, Jr., M.J. Wiley, and B.L. Sparks-Jackson. 2008. A spatially-constrained clustering program for river valley segment delineation from GIS digital river networks. *Environmental Modelling and Software* 23:638-649.
- Brenden, T.O.**, E.M. Hallerman, B.R. Murphy, J.R. Copeland, and J.A. Williams. 2007. The New River, Virginia, muskellunge fishery: population dynamics, harvest regulation modeling, and angler attitudes. *Environmental Biology of Fishes* 79:11-25.
- Brenden, T. O.**, L. Wang, P.W. Seelbach, R.D. Clark, Jr., and J. Lyons. 2007. Comparison between model-predicted and field-measured stream habitat features for evaluating fish assemblage-habitat relationships. *Transactions of the American Fisheries Society* 136:580-592.
- Brenden, T.O.**, B.R. Murphy, and E.M. Hallerman. 2006. The effect of discharge on daytime habitat use and selection of muskellunge in the New River, Virginia. *Transactions of the American Fisheries Society* 135:1546-1558.
- Brenden, T.O.**, R.D. Clark, Jr., A.R. Cooper, P.W. Seelbach, L. Wang, S.S. Aichele, E.G. Bissell, and J.S. Stewart. 2006. A GIS framework for collecting, managing, and analyzing multi-scale landscape variables across large regions for river conservation and management. Pages 49-74 *in* R.M. Hughes, L. Wang, and P.W. Seelbach, editors. Influences of landscapes on stream habitats and biological assemblages. American Fisheries Society, Symposium 48, Bethesda, Maryland.
- Brenden, T.O.**, E.M. Hallerman, and B.R. Murphy. 2006. Sectioned pelvic fin ray ageing of muskellunge *Esox masquinongy* from a Virginia river: comparisons among readers, with cleithrum estimates, and with tag-recapture growth data. *Fisheries Management and Ecology* 13:31-37.
- Brenden, T.O.**, and B.R. Murphy. 2006. Variance-covariance estimation of standard weight equation coefficients. *Journal of Freshwater Ecology* 21:1-7.
- Brenden, T.O.**, B.R. Murphy, and E.M. Hallerman. 2005. Predatory impact of muskellunge on New River, Virginia, smallmouth bass. *Proceedings of the Southeastern Association of Fish and Wildlife Agencies* 58(2004):12-22.
- Lindell, S., B. Delbos, R. Perham, J. Goldman, E.M. Hallerman, **T.O. Brenden**. 2004. Hatchery and grow-out performance of sunshine bass and backcross hybrid striped bass in recirculating aquaculture systems. *International Journal of Recirculating Aquaculture* 5:43-54.
- Brenden, T.O.**, and B.R. Murphy. 2004. Experimental assessment of age-0 largemouth bass and juvenile bluegill competition in a small impoundment in Virginia. *North American Journal of Fisheries Management* 24:1058-1070.
- Brenden, T.O.**, B.R. Murphy, and E.M. Hallerman. 2004. Estimating total error in locating radiotelemetry transmitters by homing in a riverine environment. *Journal of Freshwater Ecology* 19:295-304.
- Brenden, T.O.**, B.R. Murphy, and J.B. Birch. 2003. Statistical properties of the relative weight ( $W_r$ ) index and an alternative procedure for testing  $W_r$  differences between groups. *North American Journal of Fisheries Management* 23:1136-1151.
- Murphy, B.R., **T.O. Brenden**, and E.M. Hallerman. 2003. Assessment of Virginia's management of riverine muskellunge fisheries. Virginia Department of Game and Inland Fisheries, Federal Aid in Sport Fish Restoration, Project Number F-122-R, Project Completion Report, Richmond.

- Brenden, T.O.**, and B.R. Murphy. 2002. Trophic dynamics of a slow growing age-0 largemouth bass cohort from a Virginia small impoundment. *Journal of Freshwater Ecology* 17:609-619.
- Brenden, T.O.**, and J.A. Williams. 2001. New records of *Esox niger* Lesueur, 1818 and *Lepisosteus osseus* (Linnaeus, 1758) in the New River, Virginia. *Banisteria (Journal of the Virginia Natural History Society)* 18:44.
- Brenden, T.O.**, B.R. Murphy, S. Manos, C.S. Vandergoot. 1999. A submerged cage designed for aquatic research. *North American Journal of Aquaculture* 61:359-362.

### **Presentations (\*Presenter)**

- Wang, L.\*, J. Stewart, P. Seelbach, and **T. Brenden**. 2007. Landscape based identification of human disturbance gradients and references for streams in Michigan and Wisconsin. Oral Presentation: 2007 AFS Annual Meeting, San Francisco, California.
- Wang, L.\*, J. Stewart, P. Seelbach, and **T. Brenden**. 2007. A multi-state stream network classification and database for bioassessment and aquatic resources management. Oral Presentation: 2007 AFS Annual Meeting, San Francisco, California.
- Benbow, M.\*, T. Wagner, **T. Brenden**, and 13 others. 2007. New frontiers into the ecology of Buruli ulcer disease – an update on using satellite imagery to quantify landscape-ecology linkages with disease occurrence in West Africa. World Health Organization: Annual meeting of the Global Buruli Ulcer Initiative.
- Mckenna, J.E.\*, C. Castiglione, J. Stewart, J. Schaeffer, **T. Brenden**. 2007. Great Lakes basin scale-dependent aquatic habitat classification guided by biotic distributions. Oral Presentation: 2007 International Association of Great Lake Research Conference, May 30, University Park, Pennsylvania
- Brenden, T. O.**, L. Wang\*, R. Clark, Jr. P. W. Seelbach, and M. J. Wiley. 2006. Ecological stream segment identification for digital river networks. Oral Presentation: 2006 Michigan AFS Conference, February 7, East Lansing, Michigan.
- Brenden, T. O.**, L. Wang\*, R. Clark, Jr. P. W. Seelbach, and M. J. Wiley. 2005. Ecological stream segment identification for digital river networks. Oral Presentation: 2005 Midwest Fish and Wildlife Conference, December 12, Grand Rapids, Michigan.
- Brenden\***, **T. O.**, E. M. Hallerman, B. R. Murphy, J. R. Copeland, and J. A. Williams. 2005. The New River, Virginia, muskellunge fishery: population dynamics, harvest regulation modeling, and angler attitudes. Dr. E. J. Crossman International Muskie Symposium, October 29, Indianapolis, Indiana.
- Brenden\***, **T. O.**, L. Wang, R. Clark, Jr. P. W. Seelbach, and M. J. Wiley. 2005. A clustering algorithm for ecological stream segment identification from spatially extensive digital databases. Oral Presentation: 2005 Annual Meeting of the North American Benthological Society, May 27, New Orleans, Louisiana.
- Brenden, T. O.**, L. Wang\*, R. Clark, Jr. P. W. Seelbach, and M. J. Wiley. 2005. A clustering algorithm for ecological stream segment identification from spatially extensive digital databases. Oral Presentation: 2005 International Association of Great Lake Research Conference, May 27, Ann Arbor, Michigan.
- Brenden, T. O.**, L. Wang\*, R. Clark, Jr. P. W. Seelbach, and M. J. Wiley. 2005. A variable selection process for identification of ecological stream segments. Oral Presentation: 2005 International Association of Great Lake Research Conference, May 27, Ann Arbor, Michigan.
- Brenden\***, **T. O.**, B. R. Murphy, and E. M. Hallerman. 2004. Predatory impact of muskellunge on New River, Virginia, smallmouth bass. Oral Presentation: 2004 Southeastern Association of Fish and Wildlife Agencies, November 1, Hilton Head, South Carolina.
- Brenden\***, **T. O.**, B. R. Murphy, and E. M. Hallerman. 2003. Modeling habitat use and the effect of alternative harvest regulations on the New River muskellunge fishery. Oral Presentation: 2003 AFS Virginia-Virginia Tech Joint Meeting, March 20, Blacksburg, Virginia.
- Brenden\***, **T. O.**, B. R. Murphy, and E. M. Hallerman. 2003. Modeling the effect of alternative harvest regulations on the New River muskellunge fishery. Oral Presentation: 2003 AFS Southern Division Spring Meeting, February 16, Wilmington, North Carolina.

- Brenden\*, T. O.**, B. R. Murphy, and J. B. Birch. 2003. Statistical properties of the relative weight ( $W_r$ ) index and an alternative procedure for testing  $W_r$  differences between groups. Poster Presentation: 2003 AFS Southern Division Spring Meeting, February 16, Wilmington, North Carolina.
- Brenden\*, T. O.**, B. R. Murphy, and E. M. Hallerman. 2002. Habitat influence on the spatio-temporal distribution of muskellunge in a 17-km reach of the New River, VA. Oral Presentation: 2002 AFS Annual Meeting, August 26, Baltimore, Maryland.
- Brenden\*, T. O.**, S. D. Klopfer, and B. R. Murphy. 1999. GutChek 2.0: software for computing diet-breadth and overlap indices. Poster Presentation: The 4<sup>th</sup> Microcomputer Applications in Fish and Wildlife Conference, October 24-27, Lake Tahoe, Nevada.
- Brenden\*, T. O.**, and B. R. Murphy. 1999. Competition between largemouth bass and bluegill and its implications for management of small impoundments. Oral Presentation: 1999 AFS Annual Meeting, September 2, Charlotte, North Carolina.
- Brenden\*, T. O.**, and B. R. Murphy. 1999. Trophic interactions of age-0 largemouth bass and juvenile bluegill. Oral Presentation: Southern Division AFS Mid-Year Meeting, February 28, Chattanooga, Tennessee.
- Brenden\*, T. O.**, and B. R. Murphy. 1999. Competitive interactions between age-0 largemouth bass and juvenile bluegill. Oral Presentation: Virginia - North Carolina Joint AFS Meeting, January 28, Dansville, Virginia.