**Christopher J. Patrick, Ph.D.**

Curriculum Vitae

October 24, 2016

Assistant Professor

Life Sciences Department

Texas A&M University Corpus Christi

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**EDUCATION**

Ph.D. Ecology

University of Notre Dame (UND), South Bend, Indiana, 2012

BS: Behavior, Ecology, Evolution, and Systematics, *High Honors*

University of Maryland (UMD), College Park, Maryland, 2006

**APPOINTMENTS**

Texas AM University – Corpus Christi

Assistant Professor Department of Life Sciences

American Association for the Advancement of Science (AAAS)

AAAS S&T Fellow

Working with EPA Office of Water, 2014 - 2015

Smithsonian Environmental Research Center

Research Associate Ecological Modeling Laboratory, 2014 - present

Ecologist Ecological Modeling Laboratory, 2011- 2014

University of Maryland, Baltimore County

Adjunct Professor Department of Geography, 2013

**PUBLICATIONS (13 print, 2 accepted, 1 revision, 1 review, 3 prep)**

**Print**

1. Patrick, C.J. & Weller, D. (2015) Interannual variation in submerged aquatic vegetation and its relationship to water quality in subestuaries of Chesapeake Bay. *Marine Ecology Progress Series* 537: 121–135

2. Patrick, C.J., Weller, D., & Ryder, M. (2015) Effects of shoreline armoring on adjacent submerged aquatic vegetation in Chesapeake Bay and nearby Atlantic Coastal Bays. Estuaries and Coasts. online early

3. Patrick, C.J. (2014). A description of the environment and benthic invertebrate communities in transitional habitats between lakes, streams, and wetlands in the Upper Peninsula of Michigan. Fundamental and Applied Limnology. online early

4. Patrick, C.J., Cooper, M., & Uzarski, D. (2014). The effect of spatial scale and dispersal ability on aquatic invertebrate community organization in a drowned rivermouth wetland complex. Wetlands. 34(6): 1133--1143

5. Patrick, C.J., Peters, H., Cavannaugh, K., and Knotochick, T. (2014). Application of network theory to understanding spatio-temporal stability in freshwater and marine communities. Limnology & Oceanography. Ecodas X Symposium Proceedings

6. Roley, S., Levi, P., Grifiths, J.R., Patrick, C.J., Peter, H., Sadro, S., & Zarnetske, J. (2014). The state of ecosystems: progress in quantifying ecosystem health. Limnology & Oceanography

7. Stauffer, B., Patrick, C.J., Peters, H., & Robinson, K. (2014). Temporal scales of drivers of community dynamics: from microbes to macrofauna across the salinity gradient. Limnology & Oceanography

8. Patrick, C.J., Weller, D., Ryder, M., & Xuyong, L. (2014) Effects of shoreline alteration and other stressors on submerged aquatic vegetation in subestuaries of Chesapeake Bay and the mid- Atlantic Coastal Bays. Estuaries & Coasts

9. Patrick, C.J. & D.H. Fernandez (2013) Invertebrate β-richness affects ecosystem functioning in stream networks. Oecologia 172: 1105-1115

10. Patrick, C.J. (2013) The effect of shredder diversity on the quality and quantity of fine particulate organic matter. Freshwater Science 32(3): 1026-1035

11. Choate, D., C. Prather, M. Michel, A. Baldridge, M. Barnes, D. Hoekman, C. J. Patrick, & J. Rueeg. (2012) Integrating theory: a graphical model for graduate students and researchers. Bioscience. 62(6): 594-602

12. Brown, B.L., C.M. Swan, D.A. Auerbach, E.H. Grant, N.P. Hitt, K.O. Maloney, C.J. Patrick. (2011) The metacommunity concept as a multi-species, multi-scale framework for studying the influence of river network structure on riverine communities and ecosystems. Journal of the North American Benthological Society. 30(1): 310-327

13. Patrick, C.J. & C.M. Swan. (2011) Reconstructing aquatic insect metacommunity assembly after a severe disturbance. Journal of the North American Benthological Society. 30(1): 259-272

14. Patrick, C.J. (2009) Ballast Water Law: An examination of the problem and the last 25 years of ineffective legislation. Virginia Environmental Law Journal 27(1): 68-89.

**Accepted**

15. Sciance, B., Patrick, C.J., Weller, D.E., Williams, M.E., McCormick, M., Hazelton, E. (2016). Local vs Regional Drivers of an invasive species: *Phragmites australis* in Chesapeake Bay. *Biological Invasions*

16. Kornis, M.S., Brietburg, D., Balouskus, R., Bilkovic, D.M., Davias, L.A., Giordano, S., Heggie, K., Hines, A.H., Jacobs, J.M., Jordan, T.E., King, R.S., Patrick, C.J., Seitz, R.D., Soulen, H., Targett, T.E., Weller, D.E., Whigham, D.F., Uphoff Jr., J. Evidence that abundance of estuarine fishes and crustaceans are affect by shoreline hardening and land Cover. *Estuaries & Coasts*

**In Revision**

17. Patrick, C.J. & Yuan, L.L. (2015). Modeling hydrologic metrics to demonstrate linkages between hydrologic alteration and stream assemblages. *Ecological Applications*

**In Review**

18. Patrick, C.J. & Brown, B.L. (2016). The role of functional diversity of the regional species pool in determining stream invertebrate β-richness for a watershed. Target journal: *American Naturalist*.

19. Christopher J. Patrick, Donald E. Weller, Michael Hannam, Robert J. Orth, David E. Wilcox (2016). Heirarchical controls on macrophyte community composition and recovery rates. Target Journal: *Estuaries & Coasts*

**Preparation (in order of closest to submission)**

20. Patrick, C.J. & Yuan, L.L. (2016). The modifiable areal unit problem and implications for metacommunity ecology. Target Journal: *Ecology*

21. Patrick, C.J. & Yuan, L.L. (2016). Continental scale patterns in niche and neutral processes across aquatic systems. Target Journal: *PNAS*

22. Patrick, C.J. & Kirby K. (2014). Leaf identify modifies the relationship between shredder diversity leaf break down rates. Target Journal: *Freshwater Biology*

**ACADEMIC HONORS & AWARDS**

TAMU-CC RCO Internal Funding, 2016 Spring ($1,500)

AAAS Policy Fellowship Award, 2014 Spring

EPA SAV Technical Synthesis 3 ($100,000; SERC Award: $16,500)

Invited Participant of Eco-DAS X: Ecological Dissertations in the Aquatic Science, 2012 Fall ($2,800)

Entomological Society of America Runner-up for the President’s Prize in

Biodiversity, 2010 Winter

University of Notre Dame Professional Development Grant ($475), 2010 Fall

Carey Institute for Ecosystem Studies Academic Scholarship ($525), 2010 Fall

Bayer Fellowship ($9,333), 2010 Spring

GLOBES IGERT Trainee Fellowship ($10,000), 2010 Winter

UND Environmental Research Center Mentor Fellowship ($6,250), 2010 Winter

*American Institute of Biological Sciences*Emerging Public Policy Leadership Award,

 Honorable Mention, 2009

UND Center for Aquatic Conservation Fellowship ($8,333), 2008 Spring

UND Environmental Research Center Research Fellowship ($18,750), 2007 Winter

Arthur J. Schmitt Presidential Fellowship ($50,000), 2006 Fall

Senior Summer Scholars Research Grant ($3,000), 2005 Summer

UMD Honors Research Grant ($500), 2005 Winter

UMD Department of Entomology Cory Scholarship ($1,000), 2005 Winter

UMD Life Science Scholars Citation, 2004 Fall

**PRESENTATIONS [41 total, 15 invited\*, 2 posterŧ**

Cross, W., D. Allen, A. Benke, T. Brey, A. Huryn, J. Jones, D. McGarvey, C. Murphy, **C. Patrick**, C. Ruffing, P. Saffarinia, M. Whiles, G. Woodward (2016). Toward understanding drivers of community-level invertebrate production using structural equation modeling. Society for Freshwater Science, Sacramento, CA

Ruffing,C., J. Jones, M. Whiles, D. Allen, K. Anderson, A. Argerich, A. Chara-Serna, S. Cooper, W. Cross, N. Galic, J. Grace, A. Holland, S. Johnson, J. Larson, D. McGarvey, C. Murphy, R. Nisbet, **C. Patrick**, B. Penaluna, P. Saffarinia (2016). Challenges and opportunities for advancing food web theory and analysis in stream ecosystems through modeling. Society for Freshwater Science, Sacramento, CA

Patrick, C.J., D.E. Weller, C. Gallegos, M. Williams, M. Ryder, X. Li, M. Hannam, L. Karrh, B. Landry, B. Golden, M. Lewandowski, E. Koch, D. Booth, B. Swerida, & L. Sanford (2016) Interacting Effects of Land Use and Shoreline Armoring on Submerged Aquatic Vegetation (SAV) in Chesapeake Bay. Seagrass Monitoring Workgroup Meeting. UTMSI, May 18, 2016

Patrick, C.J. (2016) Observing spatial and temporal changes in the patterns of drivers and responses in aquatic ecosystems. Harte Research Institute Seminar Series. April 29, 2016

Patrick, C.J., D.E. Weller, M.E. Williams (2015) Integrating long-term and large scale data to understand SAV responses to multiple stressors. Coastal Estuarine Research Federation, Portland, Oregon

Patrick, C.J. & L.L. Yuan (2015) Biotic response to flow alteration in mid-atlantic streams. Society for Freshwater Science, Milwaukee, WI

Sciance, B., **C.J. Patrick**, M.N. Williams, & D.E. Weller (2014) Factors affecting an invasive marsh plant in Chesapeake Bay. Esri Users Conference, San Diego, CA

Williams, M.N., **C.J. Patrick**, & D.E. Weller (2014) Does it take a village to raise a seedling? Esri Users Conference, San Diego, CA

ŧLandry, J.B., **C.J. Patrick**, R.R. Golden, D. Weller, E. Koch, & L. Karrh (2014) Interacting effects

 of land-use and shoreline hardening on submerged aquatic vegetation. Atlantic Estuarine

 Research Federation Meeting, Ocean City, MD

Patrick, C.J., D.E.,Weller, & M.N. Williams (2014) Fluctuations in SAV abundance in subestuaries of Chesapeake Bay. Chesapeake Bay Modeling Symposium, Annapolis, MD

\*Patrick, C.J. (2014) A post-doctoral perspective on life after grad school stuck in the weeds.

 Preparing the next generation of scientists: photography exhibition and presentation.

 Smithsonian Environmental Research Center, Edgewater, MD

\*Patrick, C.J. & Brown, B.L. (2014) Disentangling the effect of macroinvertebrate species pool

 functional diversity from the influence of environmental variation on the β-diversity of

 watersheds. Chesapeake Bay Modeling Symposium, Annapolis, MD

\*Patrick, C.J. (2014) Aquatic community ecology at multiple spatial scales. ECODAS Reunion

 Meeting. Portland, Oregon

Patrick, C.J., D.E.,Weller, & M.N. Williams (2014) Fluctuations in an underwater garden: Linking year-to-year variation in Chesapeake Bay SAV to water quality and prior SAV distribution.

 Joint Aquatic Sciences Meeting, Portland, Oregon

Patrick, C.J. & Weller, D.E (2013) Multi-scale controls of submerged aquatic vegetation in

 Chesapeake Bay. Coastal Estuarine Research Federation, San Diego, CA

Kurtz, E. E., **C. J. Patrick**, and D. E. Weller. (2013) The effects of shoreline alteration and land

use on the abundance of submerged aquatic vegetation. Landscape Dynamics along Environmental Gradients, 2013 Annual Symposium, Austin, TX

\*Patrick, C.J. & Weller, D.E. (2013) Relationships between inter-annual variability in water quality

 and SAV at broad scales in Chesapeake Bay. SAV Workgroup Meeting. USFWS

 Chesapeake Bay Field Office, August 19, 2013

\*Patrick, C.J. & Weller, D.E. (2013) Land use and shoreline armoring effects on different aquatic

 plant communities throughout Chesapeake Bay. Special Session: Estuaries, rivermouths,

 and coastal wetlands. Society for Freshwater Science, Annual Meeting, Jacksonville, FL

\*Patrick, C.J., Weller, D.E., & Ryder, M. (2013) Effects of land use and shoreline alteration on SAV. Smithsonian Environmental Research Center, February 7, 2013

\*Patrick, C.J., Weller, D.E. & Ryder, M. (2012) Multiple stressors affecting the distribution of

 submerged aquatic vegetation in the Chesapeake Bay region. Horn Point Laboratory,

 University of Maryland

\*Patrick, C.J., Weller, D.E. & Ryder, M. (2012) Multiple stressors affecting the distribution of

 submerged aquatic vegetation in the Chesapeake Bay region. Carey Institute for Ecosystem

 Studies

\*Patrick, C.J. (2012) Things in the now and the stuff back then: Achieving integration in

 aquatic research by crossing sub-disciplines of ecology. Biological Sciences Departmental

 Seminar Series: University of Pittsburgh, Pittsburgh, PA

\*Patrick, C.J. (2012) The causes, and potential effects of variation in the spatial configuration of

shredder species among headwater streams in networks. Behavior, Evolution, Ecology, & Systematics Departmental Seminar Series: University of Maryland, College

 Park

\*Patrick, C.J. (2012) The causes, and potential effects of variation in the spatial configuration of

 shredder species among headwater streams in networks. Stream Team Seminar:

Virginia Tech University, Blacksburg, VA

Patrick, C.J., Weller, D.E. & Ryder, M. (2012) Multiple stressors affecting the distribution of

 submerged aquatic vegetation in the Chesapeake Bay region. Chesapeake Modeling

 Symposium, Annapolis, MD

Patrick, C.J., Weller, D.E. & Ryder, M. (2012) Multiple stressors affecting the distribution of

 submerged aquatic vegetation in the Chesapeake Bay region. Benthic Ecology Meeting,

 Norfolk, VA

\*Patrick, C.J. (2012) The causes and consequences of aquatic invertebrate diversity in stream

networks. Department of Geography & Environmental Systems Seminar: University of Maryland, Baltimore County.

Patrick, C.J. (2011) The causes and consequences of aquatic invertebrate diversity in stream

 networks. Notre Dame Department of Biological Sciences Departmental Seminar. Notre

 Dame, IN

\*Patrick, C.J. (2011) Biological Diversity. Lecture and discussion with undergraduates in a course on Climate change and research at SERC. Smithsonian Environmental Research Center, Edgewater, Maryland

\*Patrick, C.J. (2011) Getting into graduate school. Lecture and discussion with students in the UMD Biological Sciences Departmental Honors Program, University of Maryland, College Park.

Patrick, C.J. (2011) The causes and consequences of aquatic invertebrate diversity in stream

 networks. Smithsonian Environmental Research Center (SERC) Seminar Series. SERC

 Edgewater, MD

Patrick, C.J. (2011) What’s a metacommunity? Why does it matter for stream networks? Trout

 Lake Station, LTER and Field Station of the Center for Limnology at the University of

 Wisconsin, Madison, Minocqua, WI

Patrick, C.J. (2011) What’s a metacommunity? Why does it matter for stream networks?

 University of Notre Dame Environmental Research Center. Land O’ Lake WI

Patrick, C.J. & M. Cooper (2011) Invertebrate community organization across spatial scales in a

 wetland complex. Ecological Society of America Annual Meeting. Austin, Texas

Patrick, C.J. & D. Fernandez (2011) The effect of stream insect β-richness on network scale

decomposition and particle export. North American Benthological Society Annual Meeting. Providence, Rhode Island

Patrick, C.J. & D. Fernandez (2010) The effect of β-richness on fine particulate organic

 matter export through interspecific interactions in artificial stream networks.

 Entomological Society of America Annual Meeting. San Diego, California

Fernandez, D. & **C.J. Patrick** (2010) A closer look at the behavioral dynamics of

 shredders in leaf litter break down. Midwest Fish & Wildlife Annual Meeting.

 Minneapolis, Minnesota

Patrick, C.J. (2010) The effect of shredder species richness on the production and character

 of fine organic particles in aquatic habitats. Ecological Society of America Annual

 Meeting, Pittsburgh, Pennsylvania.

\*Patrick, C.J. & C.M. Swan. (2009) Determining the relative roles of space, habitat quality,

and interspecific interactions in the assembly of a stream insect metacommunity. *Symposium- Advances in aquatic entomology: Celebrating the role of aquatic insects in scientific research.*Entomological Society of America Annual Meeting, Indianapolis, Indiana.

Patrick, C.J., C.M. Swan, N.M. Seta, & A.A. Marrah. (2009) Disentangling habitat quality

from spatial effects in the analysis of stream insect community assembly in multiple watersheds.  North American Benthological Society Meeting, Grand Rapids, Michigan.

ŧPatrick, C.J. (2008) Community composition changes in a hydrologic network in

Pennsylvania following the implementation of the Clean Water Act. North American Benthological Society Meeting, Salt Lake City, Utah.

**PROFESSIONAL EXPERIENCE**

Co-Organizing a special issue in Canadian Journal of Fisheries and Aquatic Sciences on the effects

 of climate change on species interactions in aquatic systems.

Participant in Chesapeake Bay Program Working Group to develop the SAV Technical Synthesis

 III, a report on advances in submerged aquatic vegetation science over the past 14 years

Special Session Co-Organizer: Co-developed the special session – Effects of climate

 change on species interactions in aquatic systems. Joint Aquatic Sciences Meeting,

Portland, Oregon 2014

Participant in Chesapeake Bay Program Workshop to update the analysis of trends in water quality and bio-monitoring data, March 2014

Member of the Chesapeake Bay Program SAV Workgroup 2012 - present

Session Moderator - Estuaries, rivermouths, and coastal wetlands. Society for Freshwater Science,

 Annual Meeting, Jacksonville, FL

Symposium Co-Organizer: Co-developed the symposium- Getting wet and making friends outside

 of Academia. 2011. Entomological Society of America Annual Meeting, Nevada,

 California

Symposium Co-Organizer: From January to December 2010

Co-developed the symposium- Across systems and biomes: ecology and evolution of insects in aquatic habitats. 2010. Entomological Society of America Annual Meeting,

 San Diego, California

Reviewer for *Methods in Ecology & Evolution, Ecology*, *Oecologia, Freshwater Science,*

 *Conservation Biology,* *Community Ecology,* *Hydrobiologia*, *Ecological Entomology*, *Aquatic Sciences, PLOS ONE*

UND Biology Graduate Student Organization, 2007-2009

Responsible for planning and bringing in the American Institute of Biological Sciences for the graduate student run *Science and Society: Bridging the Divide* seminar series.

**TEACHING EXPERIENCE**

Adjunct Professor, University of Maryland, Baltimore County 2013

 Teaching Aquatic Ecology GES 406/606 (Lecture & Field Lab)

SERC Summer Intern Program, 2012

 Worked closely with an intern to develop and implement a research project.

UND Sensing Our World Science Camp, 2010

 Lead middle school students in activities designed to teach them about ecology, chemistry,

 and physics.

UND Teaching Apprenticeship: Ecology, 2010 Fall

I participated in the design and implementation of General Ecology. My responsibilities included writing exam questions, creating and delivering original lectures, grading papers and exams, and aiding in the development of original lesson plans and the overall curriculum.

UND TA: Introduction to Molecular Biology Lab, 2008 Fall

General introduction to molecular techniques including electrophoresis, DNA Isolation, PCR, and culturing cells.

UND TA: Aquatic Ecology, 2007 Fall

Course teaches students with a biology background the ecology of lakes and rivers and ecological methods for studying those systems.

UNDERC Fellow Summer Mentor 2007- 2011

Work with two students for 6 months to develop an independent research project and then help them carry out the research over the summer at UNDERC.  Work culminates with a report and presentation.

UMD TA: Honors Practicum, 2006 Spring

Discussion style introduction to the philosophy, ethics, and procedures of research across disciplines.

**SPECIAL COURSES & TRAINING**

SESYNC Bayesian Modeling 2 week Course 2015 Winter

EPA Water Quality Standards Academy 2014 Winter

Crucial Conversation Communication Training Workshop 2014 Fall

Negotiations Training Workshop 2014 Fall

SEM Short Course taught by Jim Grace 2014 Fall

ESRI Introduction to PYTHON 2013 Spring

Advanced Biostatistics: Maximum Likelihood & Bayesian Analysis 2011 Spring

Stable Isotope Analysis – ND Center for Environmental Science & Technology 2011 Spring

Fundamentals of Ecosystem Ecology-Carey Institute for Ecosystem Ecology 2011 Winter

American Institute of Biological Science Policy Training Workshop 2009 Winter

ESRI GIS Training Workshop, 2008 Fall

COMPASS Policy Training Workshop, 2008 Fall

COMPASS Communication Workshop, 2008 Winter

Advanced Environmental Law, University of Notre Dame School of Law, 2007 Spring

Introduction to GIS, University of Maryland, 2006 Spring

**RELATED PROFESSIONAL SKILLS**

ArcGIS 9.3, 10.1/2/3

Statistical Program R (Data Analysis and Management)

Statistical program SYSTAT

Aquatic macroinvertebrate taxonomy

Elemental analysis

Basic water chemistry procedures

**OUTREACH**

Interviews:

What’s Up Annapolis Magazine, August 2014. Chesapeake Now: Underwater Grasses

SERC Shorelines, Spring 2014. What’s Threatening the Bay’s Underwater Plants?

South River Living, Spring 2014. What’s Killing Underwater Plants in the Chesapeake?

Radio Interview on WNAV 1430 – Living Green – 2013

 Go to the link to listen: <http://annapolisgreen.com/audio/livinggreen_2013-11-13.mp3>

Smithsonian Evening Lecture Series: Organizer – 2013

 Organized monthly lectures at SERC for the public on Smithsonian Research as well as

 other interesting research programs around the region.

Commissioner, Annapolis Environmental Commission 2012 – 2013

Science Cafe:Organizer and Co-developer of the Notre Dame – South Bend Science Café 2009-2011. Responsible for planning a monthly community outreach event. Responsibilities include scheduling speakers, securing funding and venue space, organizing events, and recording disseminating events via podcast on ND-iTunesU

Popular Science Writer

 - Invasivore.org 2012

- Chesapeake Taste Magazine 2011- 2012

-What’s Up Annapolis Magazine 2007 – 2011

**PROFESSIONAL SOCIETIES & ORGANIZATIONS**

Society for Freshwater Science 2012 – Present

Coastal Estuarine Research Federation 2013 - Present

Benthic Ecology Meeting Society 2012

Indiana Academy of Science 2010 - Present

Entomological Society of America 2009- Present

Ecological Society of America 2008-Present

North American Benthological Society 2005-2012

Sigma Xi, 2005-Present

Golden Key Honor Society, 2003-Present