Christopher J. Patrick, Ph.D.

Curriculum Vitae
January 24, 2020

Assistant Professor
Biology Department
Virginia Institute of Marine Science
College of William and Mary
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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

Virginia Institute of Marine Science – College of William and Mary
Assistant Professor in Biology, 2020 – Present

Texas AM University – Corpus Christi
Assistant Professor in the Department of Life Sciences, 2016 – 2020

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, 2014 - present
Ecologist in the Ecological Modeling Laboratory, 2011- 2014

University of Maryland, Baltimore County
Adjunct Professor in the Department of Geography, 2013

PUBLICATIONS (25 Published or Accepted, 5 in Review or Revision)

In Review or Revision

Hogan, J.Aaron[1*], Russell A. Feagin[2], Gregory Starr[3], Michael Ross[4], Teng-Chiu Lin[5], Christine O'Connell[6], Thomas Huff[2], Beth A. Stauffer[7], Kelly L. Robinson[7], Maria Chapela Lara[8], Jianhong Xue[9], Brandi Kiel Reese[10], Simon J. Geist[10], Elizabeth R. Whitman[1], Sarah Douglas[9], Victoria M. Congdon[9], Joseph W. Reustle[10], Rachel S. Smith[11], David Lagomasino[12], Bradley A. Strickland[1], Sara S. Wilson[1], C. Edward Proffitt[10], J. Derek Hogan[10], Benjamin L. Branoff[13], Anna R. Armitage[14], Scott A. Rush[15], Rolando O. Santos[4], Marconi Campos-Cerqueira[16], Paul A. Montagna[18], Brad Erisman[9], Lily Walker[17], Whendee L. Silver[6], Todd A. Crowl[1,18], Michael Wetz[19], Nathan Hall[20], Xiaoming Zou[21], Steven C. Pennings[22], Lih-Jih Wang[23], Chung-Te Chang[24], Miguel Leon[8], William H.

McDowell[8], John S. Kominoski[1], Christopher J. Patrick[10]. (in revision). A research framework to investigate ecosystem responses to tropical cyclones. *Bioscience*

Patrick, C.J., K. McCluney, J. Sabo, A. Gregory, A. Ruiz, & J. Thorpe. (In Review). Multi-scale biodiversity affects stability in macrosystems. *Frontiers in Ecology and the Environment*

Patrick, C.J., K.E. Anderson, B.L. Brown, C.P. Hawkins, A. Metcalfe, P. Saffarinia, T. Siqueira, C.M. Swan, J.D. Tonkin, & L. Yuan (In Review). The application of metacommunity theory to the management of running waters. *Freshwater Biology*

Kornis M.S., Ogburn M.B., Patrick C.J., Hogan J.D. (In Revision). Promoting commercial or recreational harvest as a tool for controlling aquatic invasive species: risks and rewards of the invasivore movement. *Biological Invasions*.

Published or accepted

Patrick, C.J., Yeager, L., Armitage, A.R., Carvallo, F., Congdon, V., Dunton, K.H., Fisher, M., Hardison, A., Hogan, J., Hosen, J., Hu, X., Kiel Reese, B., Kinard, S., Kominoski, J., Lin, X., Liu, Z., Montagna, P.A., Pennings, S., Walker, L., Weaver, C.,Wetz, M. (accepted). A systems level analysis of hurricane impacts on a coastal region. *Estuaries and Coasts*

Orth, R.J., W.C. Dennison, C. Gurbisz, M. Hannam, J. Keisman, J.B. Landry, J.S. Lefcheck, K.A. Moore, R.R. Murphy, C.J. Patrick, J. Testa, D.E. Weller, D.J. Wilcox, R.A. Batuik (accepted). Long-term annual aerial surveys of submersed aquatic vegetation (SAV) support science, management, and restoration. *Estuaries and Coasts*

Patrick, C.J. (2019). Analysis of Statewide Probabilistic Data- Texas Bays & Estuaries. Texas Commission on Environmental Quality. Contract 582-18-80199

Patrick, C.J., McGarvey, D., Cross, W., Allen, D., Benke, A., Brey, T., Huryn, A., Jones, J., Murphy, C., Ruffing, C., Saffarinia, P., Whiles, M., Wallace, B., & Woodward, G. (*2019)*. Precipitation and temperature drive global patterns in stream invertebrate secondary production. *Science Advances* 5: eaav2348

Tiegs et al. The CELLDEX Consortium (2018). Global patterns and drivers of ecosystem functioning in rivers and riparian zones. *Science Advances* 5(1): eaav0486

Patrick, C.J. & Yuan, L.L. (2018). The challenge of spatial context for community ecology across scales. *Oikos – Forum Article.* 128: 297-308

Lefcheck, J.S., Orth, J.J., W.C., Gurbisz, C., Hannam, H., Keisman, J., Landry, J.B., Moore, K.A., Murphy, R.R., Patrick, C.J., Testa, J., Weller, D.E., & Wilcox, D.J. (2017). Nutrient reductions lead to unprecedented recovery of a temperate coastal ecosystem. *Proceedings of the National Academy of Science* 115(14): 3658-2662

Patrick, C.J. & Brown, B.L. (2018). The role of functional diversity of the regional species pool in determining stream invertebrate β-richness for a watershed. *American Naturalist*. 191(5): E159-170

Orth, J.J., Dennison, W.C., Lefcheck, J.S., Gurbisz, C., Hannam, H., Keisman, J., Landry, J.B., Moore, K.A., Murphy, R.R., Patrick, C.J., Testa, J., Weller, D.E., & Wilcox, D.J. (2017) Submersed aquatic vegetation in Chesapeake Bay: sentinel species in a changing world. *Bioscience* 67(8): 698-712

Patrick, C.J. & Yuan, L.L. (2017). Modeling hydrologic metrics to demonstrate linkages between hydrologic alteration and stream assemblages. *Ecological Applications* 27(5): 1605-1617

Patrick, C.J., D.E. Weller, M. Hannam, R.J. Orth, D.E. Wilcox (2017). Land use and salinity drive changes in SAV abundance and community composition. *Estuaries & Coasts* DOI: 10.1007/s12237-017-0250-1

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. (2017). Evidence that abundance of estuarine fishes and crustaceans are affect by shoreline hardening and land cover. *Estuaries & Coasts.* 40(5): 1464-1486

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* 18:2661-2677

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

Patrick, C.J., Weller, D., & Ryder, M. (2015) The relationship between shoreline armoring and adjacent submerged aquatic vegetation in Chesapeake Bay and nearby Atlantic Coastal Bays. *Estuaries and Coasts*. 39:158-170

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*. 185(3-4):223-234

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

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

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*. Ecodas X Symposium Proceedings

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*. Ecodas X Symposium Proceedings

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* 37(6): 1516-1531

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

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

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

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

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

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.

ACADEMIC HONORS & AWARDS ($2,293,825 in total funding garnered)

PI, National Academy of Science, Engineering, and Medicine. Moving Upstream: Quantifying materials flow between estuaries and coastal rivers, 2020 ($128,495)

PI, Coastal Bend Bays and Estuaries Program. MarineGEO Texas Biodiversity Assessment, 2019 ($32,732 to PI and Co-PI: C. Bird)

PI, National Science Foundation Directorate of Environmental Biology. Ecosystem Science Cluster: Collaborative Proposal: TERRG: Thresholds in Ecosystem Responses to Rainfall

Gradients. Proposal 1927645, 2019 ($1,200,000 total to PI and 3 Co-PI: J.D. Hogan, A. Ulseth, and M. Whiles, $926,680 to TAMU-CC)

PI, National Science Foundation Directorate of Environmental Biology. Ecosystem Science Cluster: Supplement to Ecosystem Responses to Hurricanes Synthesis Workshop. Proposal 1903760, 2019 ($19,164 total to PI and 2 Co-PI: J. Kominoski, W. McDowell, $8,000 to TAMU-CC)

PI, National Science Foundation Directorate of Environmental Biology. Macrosystems Biology: Collaborative Proposal: MRA: Teleconnections Among Great Plains NEON Sites by Wind and Wing. Proposal 1926565, 2019 ($500,000 total to PI and 3 Co-PI: J.D. Hogan, J. Thorp, K. McCluney, $286,318 to TAMU-CC)

PI, Harvey Weil Sportsman Conservationist Grant: Developing a Public Genomic Library, 2018 ($10,000 total to PI)

PI, National Science Foundation Directorate of Environmental Biology. Ecosystem Science Cluster: Ecosystem Responses to Hurricanes Synthesis Workshop. Proposal 1903760, 2018 ($96,525 total to PI and 2 Co-PI: J. Kominoski, W. McDowell, $96,525 to TAMU-CC)

National Academy of Science, Engineering, & Medicine Gulf Research Fellow, 2018-2020 ($76,000)

Co-PI, Chesapeake Bay Trust. Threshold effects of altered shorelines and other stressors on forage species and key habitats in Chesapeake Bay ($40,000 total to Co-PI's R. Seitz, D. Breitbug, M. Kornis, T. Jordan, R. Lipcius, C. Patrick, & D. Weller, $2000 in travel to Co-PI Patrick)

PI, National Science Foundation Directorate of Environmental Biology. Supplemental Funding Request to RAPID: Measuring the response of stream communities to Hurricane Harvey across a semi-arid to sub-humid gradient. Proposal 1819968, 2018 ($16,00 total to PI and 2 Co-PI: JD Hogan, B.K. Reese, $8,000 to PI Patrick Lab)

PI, National Science Foundation Directorate of Environmental Biology. RAPID: Measuring the response of stream communities to Hurricane Harvey across a semi-arid to sub-humid gradient. Proposal 1761677, 2017-2018 ($199,952 total to PI and 2 Co-PI: JD Hogan, B.K. Reese,, $103,719 to PI Patrick Lab)

Co-PI, Wisconsin Seagrant. Spatial and temporal distribution of the benthic macroinvertebrate community of lower Green Bay, 1938-present, 2018-2020 ($180,000 total to C. Houghton & P. Forsythe from UW Green Bay, V. Klump from UW Milwaukee; 0$ to C. Patrick from TAMU-CC)

PI, Texas Commission on Environmental Quality. Analysis of Statewide Probabilistic Data – 2010 Coastal Condition Assessment, Federal Grant #I-98665309-0, 2017-2018 ($30,000)

PI, Texas Comprehensive Research Fund. Effect of climate change on coastal stream ecosystems. 2017-2018 ($20,000)

Collaborator, National Science Foundation Directorate of Biological Oceanography. Collaborative Research: The tropicalization of Western Atlantic seagrass beds. Proposal 1737247, 2017-2020 ($699,095.00 awarded to PI's J. Campbell, A. Altieri, V. Paul; materials ($2000) and technician support ($20,000) to Patrick Lab)

PI, TAMU-CC Faculty Research Enhancement Grant. Impact of invasive fish removal on macroinvertebrates in Hawaiian streams, 2016 ($2,900)

PI, TAMU-CC Research Commercialization and Outreach Research Enhancement Grant. Impact of invasive fish removal on macroinvertebrates in Hawaiian streams, 2016 ($1,500)

AAAS Science & Technology Policy Fellowship Award, 2014 Spring ($186,000)

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

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

ESA 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 EPPLA 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 (67 total, 20 invited*, 11 poster[t])

Patrick, C.J., J. Kominoski, and W.H. McDowell. Synthesizing and understanding ecosystem responses to tropical cyclones. Coastal Estuarine Research Federation. 6 November 2019.

Landry, J.B., W. Dennison, R.J. Orth, D. Wilcox, J. Lefcheck, C. Gurbisz, J. Keisman, K. Moore, R. Murphy, C.J. Patrick, D.E. Weller, and J. Testa. Data synthesis for environmental management: A case study of Chesapeake Bay. Coastal Estuarine Research Federation. 5 November 2019.

Rhoades, O.K., Wied, W.L., Altieri, A.H., Barry, S.C., Bethel, E., Gaffey, B., Gruninger, T., Jenkins, V.J., Jones, M.S., Martin, C.W., Martinez Lopez, I., McDonald, A.M., O'Shea, O.R., Patrick, C.J., Paul, V.J., Reynolds, L.K., Rodriguez Bravo, L.M., Selwyn, J.D., Sun, U., van Tussenbroek, B.I., and Campbell, J.C., "Predation and herbivory vary consistently across spatial and temporal scales: a fishy tale." Coastal Estuarine Research Federation. 7 November 2019.

Rhoades, O.K., Wied, W.L., Altieri, A.H., Barry, S.C., Bethel, E., Gaffey, B., Gruninger, T., Jenkins, V.J., Jones, M.S., Martin, C.W., Martinez Lopez, I., McDonald, A.M., O'Shea, O.R., Patrick, C.J., Paul, V.J., Reynolds, L.K., Rodriguez Bravo, L.M., Selwyn, J.D., Sun, U., van Tussenbroek, B.I., and Campbell, J.C., "Predation and herbivory vary consistently across spatial and temporal scales: a fishy tale." Western Society of Naturalists. 30 October 2019.

Kinard, S., J.D. Hogan, F. Carvallo, A. Solis, B.K. Reese, & C.J. Patrick (2019). Lightning Talk: Heterogenous Fish Recolonization along a Climate Gradient Following Hurricane Harvey. Ecosystem Responses to Hurricanes Workshop, Corpus Christi, TX, USA

Reese, B.K., J.D. Hogan, B.K. Reese, S. Kinard, F. Carvallo, M. Sobol, & C.J. Patrick (2019). Lightning Talk: Microbial Community and Nutrient Responses within Stream Ecosystems Following Hurricane Harvey. Ecosystem Responses to Hurricanes Workshop, Corpus Christi, TX, USA

Patrick, C.J., J.D. Hogan, B.K. Reese, S. Kinard, F. Carvallo, M. Sobol, & A. Solis (2019). Lightning Talk: Stream Ecosystem Responses to Hurricane Harvey Stressors. Ecosystem Responses to Hurricanes Workshop, Corpus Christi, TX, USA

Patrick, C.J., K. McCluney, & A. Ruhi (2019). The role of multi-scale biodiversity in metacommunity temporal stability. Society for Freshwater Science Annual Meeting, Salt Lake City, Utah, USA

Kinard, S., F. Carvallo, D. Gonzalez, A. Solis, J.D. Hogan, B.K. Reese, & C.J. Patrick (2019). Heterogeneous fish recolonization along a climate gradient following Hurricane Harvey. Society for Freshwater Science Annual Meeting, Salt Lake City, Utah, USA

*Patrick, C.J. (2019). Submerged Aquatic Vegetation in Chesapeake Bay: A Model System for Application and Theory. Departmental Seminar, Virginia Institute for Marine Sciences – College of William and Mary, Gloucester, VA, USA

*Patrick, C.J. (2019). Drivers and Consequences of Multi-Scale Biodiversity in Aquatic Ecosystems. Departmental Seminar, Texas State University, San Marcos, TX, USA

Patrick, C.J., Yeager, L., Armitage, A.R., Carvallo, F., Congdon, V., Dunton, K.H., Fisher, M., Hardison, A., Hogan, J., Hosen, J., Hu, X., Kiel Reese, B., Kinard, S., Kominoski, J., Lin, X., Liu, Z., Montagna, P.A., Pennings, S., Walker, L., Weaver, C.,Wetz, M. (2019). A systems level analysis of hurricane impacts on a coastal region. American Society of Limnology and Oceanography, Puerto Rico, USA

Carvallo, F., S. Kinard, D. Gonzalez, A. Solis, J.D. Hogan, B.K. Reese, & C.J. Patrick (2019). Immediate impacts of a hurricane disturbance on streams across an aridity gradient. American Society of Limnology and Oceanography, Puerto Rico, USA

Kinard, S., F. Carvallo, D. Gonzalez, A. Solix, J.D. Hogan, B.K. Reese, & C.J. Patrick (2019). Heterogeneous fish recolonization along a climate gradient following Hurricane Harvey. Southern Division of the American Fisheries Society Annual Meeting, Galveston, TX

ŧHightower, M., C.J. Patrick, J.D. Hogan, B.K. Reese, S. Kinard, F. Carvallo, D. Gonzalez, V. Jenkins, & A. Solis (2019). Climate and hurricane disturbance drive temporal variation in stream algal communities along the Texas coastal bend. Southern Division of the American Fisheries Society Annual Meeting, Galveston, TX

ŧCarvallo, F., S. Kinard, D. Gonzalez, A. Solix, J.D. Hogan, B.K. Reese, & C.J. Patrick (2019). Differential hurricane recoveries by benthic invertebrates along an aridity gradient. Southern Division of the American Fisheries Society Annual Meeting, Galveston, TX

ŧSolis, A., F. Carvallo, C.J. Patrick (2019). Mapping the current range of species in genus Macrobrachium across Texas. Southern Division of the American Fisheries Society Annual Meeting, Galveston, TX

ŧWhitt, J., P. Lisi, P. McIntyre, M. Blum, D. Hogan, & C.J. Patrick (2019). Targeted invasive species removal cascades to reduce non-target invasive species through apparent facilitation. Southern Division of the American Fisheries Society Annual Meeting, Galveston, TX

Patrick, C.J., J. Lefcheck, R. Orth, W. Dennsion, C. Gurbisz, J. Keisman, J.B. Landry, K. Moore, R. Murphy, J. Testa, D.Weller, D. Wilcox, & R. Batiuk (2018). Nutrient reductions promote submersed aquatic vegetation: Thirty year of change in Chesapeake Bay. Water We Going To Do? Conference. Happauge, NY. Keynote Presentation

Hogan, D.J., Patrick, C.J., B.K. Reese, F. Carvallo, D. Gonzalez, S. Kinard, & J. Hosen. (2018). Short-term stream responses to hurricane Harvey along an aridity gradient. Hurricane Harvey Symposium, Port Aransas, TX. Oral Presentation

Patrick, C.J.*, Yeager, L., Armitage, A.R., Carvallo, F., Congdon, V., Dunton, K., Fisher, M., Hardison, A., Hogan, J., Hosen, J., Hu, X., Kiel Reese, B., Kinard, S., Kominoski, J., Lin, X., Liu, Z., Montagna, P.A., Pennings, S., Walker, L., Weaver, C.,Wetz, M. (2018). A tale of two storms: Wind and rain impacts of Hurricane Harvey. Hurricane Harvey Symposium, Port Aransas, TX. Oral Presentation

Patrick, C.J., D. Hogan, B.K. Reese, F. Carvallo, D. Gonzalez, S. Kinard, & J. Hosen. (2018). Short-term stream responses to hurricane Harvey along an aridity gradient. Society of Freshwater Science, Detroit, MI. Oral Presentation

McCluney, K., C.J. Patrick, A. Ruhi, J. Sabo, J. Thorp, & A. Gregory (2018). Multi-scale biodiversity drives stability in macrosystems. Society of Freshwater Science, Detroit, MI. Oral Presentation

[t]Kinard, S., F. Carvallo, & C. Patrick (2018). Precipitation restricts fish and macroinvertebrate assemblages. Society of Freshwater Science, Detroit, MI. Poster Presentation

[t]Solis, A. & C.J. Patrick (2018). Mapping the current range of species of genus macrobrachium across Texas. Society of Freshwater Science, Detroit, MI. Poster Presentation

Patrick, C.J. & J. Lister (2018). Nutrient loads explain spatial checkerboarding of oysters and seagrass along the U.S. Gulf of Mexico. Benthic Ecology Meeting. Corpus Christi, TX, USA. Oral Presentation

*Patrick, C.J. (2018). What aquatic insects can tell us about the factors driving biodiversity and ecosystem functioning across scales in aquatic ecosystems. Departmental Seminar. Virginia Tech, Blacksburg, VA, USA.

Orth, J.J., Dennison, W.C., Lefcheck, J.S., Gurbisz, C., Hannam, H., Keisman, J., Landry, J.B., Moore, K.A., Murphy, R.R., Patrick, C.J., Testa, J., Weller, D.E., & Wilcox, D.J. (2017). Submersed aquatic vegetation in Chesapeake Bay: Sentinel species in a changing world. Coastal Estuarine Research Federation Bi-Annual Meeting. Providence, RI, USA. Poster Presentation.

Gurbisz, C., C.J. Patrick, J. Lefcheck, & M. Hannam (2017). Inflection point in Chesapeake Bay submersed aquatic vegetation research: recent progress and future potential. Coastal Estuarine Research Federation Bi-Annual Meeting. Providence, RI, USA. Oral Presentation.

Patrick, C.J., J. Lefcheck, R. Orth, W. Dennsion, C. Gurbisz, J. Keisman, J.B. Landry, K. Moore, R. Murphy, J. Testa, D.Weller, D. Wilcox, & R. Batiuk (2017). Nutrient reductions promote submersed aquatic vegetation: Thirty year of change in Chesapeake Bay. Coastal Estuarine Research Federation Bi-Annual Meeting. Providence, RI, USA. Oral Presentation.

*Patrick, C.J. & D.Weller (2017). Caught between a rockwall and farmed place: landuse and Shoreline alteration impacts on SAV. NOAA Webinar Series

Patrick, C.J. & D. Stoker (2017). The promise of spatial community ecology for enhancing the monitoring and management of lotic systems. Society for Freshwater Science, Annual Meeting, Raleigh, NC, USA. Oral Presentation

Tiegs, S.D., Costello, D., Szlag, D., Isken, M., Ethaiya, D. and the CELLDEX Consortium. 2017. Global-scale Patterns and Drivers of Organic Matter Decomposition in Streams and Riparian Zones. Society for Freshwater Science, Annual Meeting, Raleigh, NC, USA. Oral Presentation

*Patrick, C.J. (2017) Roles of watershed development and shoreline alteration on temporal dynamics in seagrass communities. Departmental Seminar at Texas A&M University-Galveston

[£]Whitt, J.H., Patrick, C.J., Hogan, D.J., Blum, M., McIntyre, P., Lisi, P. (2017) Effect of non-native species removal on benthic communities in Hawaiian streams. American Society of Limnology and Oceanography, Honolulu, HI

*Patrick, C.J. (2017) Spatial and temporal controls on community assembly and ecosystem functioning. Departmental Seminar at University of Texas Marine Science Institute

*Patrick, C.J. (2016) Spatial and temporal controls on community assembly and ecosystem functioning. Departmental Seminar at Texas Tech University

[£]Patrick, C.J. & Yuan, L.L. (2016) Macro Ecological Spatial Smoothing: A new tool for spatial ecology. Gordon Research Conference – Unifying Ecology Across Scales. University of New England, Maine

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

[t]Landry, 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, 201

*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, F

*Patrick, C.J., Weller, D.E., & Ryder, M. (2013) Effects of land use and shoreline alteration on SAV. Smithsonian Environmental Research Center, February 7, 201

*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 W

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, Californi

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

[t]Patrick, 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.

TEACHING EXPERIENCE

Texas A&M University-Corpus Christi
- Limnology BIOL 4405/5412 (Lecture & Lab)
- Biostatistics BIOL 4590 (Lecture)
- Science Communication MARB 6102 (Lecture)
- Field and Sampling Techniques BIOL 5409 (Lecture & Lab)
- Professional Skills for Scientists BIOL/BIMS 2201 (Lecture)

University of Maryland, Baltimore County
- Aquatic Ecology GES 406/606 (Lecture & Field Lab)

Smithsonian Environmental Research Center
- Summer Intern Program, 2012-2014
- Worked closely with an intern to develop and implement a research project.

University of Notre Dame
- Sensing Our World Science Camp, 2010
- Lead middle school students in activities designed to teach them about ecology, chemistry, and physics.
- Teaching Apprenticeship: Ecology, 2010 Fall
- Teaching Assistant: Introduction to Molecular Biology Lab, 2008 Fall
- Teaching Assistant: Aquatic Ecology, 2007 Fall
- Environmental Research Center Fellow Summer Mentor 2007- 2011

University of Maryland, College Park
- Teaching Assistant: Honors Practicum, 2006 Spring

PROFESSIONAL SERVICE

Lead PI on a multi-investigator NSF Funded project studying effects of hurricane Harvey on coastal plain stream ecosystems. Coordinating 3 graduate students, 4 technicians, 3 PI's, and a collaborating post-doc

Participant and Modeling Team Leader in an NSF Funded Stream Ecology RCN. Team is working to merge meta-analysis, geospatial modeling, and SEM to advance our understanding of the environmental drivers of benthic secondary production in lotic ecosystems world-wide

Contributor and participant in the EPA Funded SAV SYN working group. Synthesis working group implementing MARSS and SEM modeling to advance our understanding of Chesapeake Bay submerged aquatic vegetation status and trends.

Special Session Organizer: Practical applications of metacommunity theory to the management of streams and rivers. Society for Freshwater Science, June 2017

Special Session Co-Organizer: Co-developed the special session – Scale of variability in aquatic

ecosystems. American Society for Limnology and Oceanography, February 2017

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, Oikos, Freshwater Science, Freshwater Biology, Conservation Biology, Community Ecology, Hydrobiologia*, *Ecological Entomology*, *Aquatic Sciences, PLOS ONE, Estuaries and Coasts, Ecosphere, Ecology, Ecology Letters*

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.

UNIVERSITY SERVICE

Organized MarineGEO Texas (Spring 2016-Spring 2017)

Managing Director for MarineGEO Texas (Spring 2017 – present)
MarineGEO Texas is a part of the Smithsonian MarineGEO research network. The program is co-sponsored by University of Texas Marine Science Institute and Texas A&M University Corpus Christi. MarineGEO Texas performs annual sampling in multiple ecosystems in the Coastal Bend of Texas and participates in network experiments.

Faculty Search Committee, Marine Botanist (Spring 2018)

University Academic Standards Grievance Committee (Spring 2017 – present)

College of Science & Engineering Distinguished Speaker Selection Committee (Fall 2017-present)

Island Days (2016-2017)

MARB Faculty

CMSS Faculty

GRADUATE STUDENT COMMITTEE MEMBERSHIP

Gonzalez, Darcia* (MSc.), Department of Life Sciences, Texas A&M – Corpus Christi

Margo, Abraham, (MSc.), Department of Life Sciences, Texas A&M - Corpus Christi

Mcaskill, Shannan, (Ph.D.), Department of Life Sciences, Texas A&M – Corpus Christi

Carvallo, Fernando* (MSc.), Department of Life Sciences, Texas A&M – Corpus Christi

Whitt, Jennifer* (MSc.), Department of Life Sciences, Texas A&M – Corpus Christi

Kinard, Sean* (Ph.D.), Department of Life Sciences, Texas A&M – Corpus Christi

Loveless, Jacob^ (MSc.), Department of Life Sciences, Texas A&M – Corpus Christi

Crockett, Patricia (Ph.D.), Department of Life Sciences, Texas A&M – Corpus Christi

Partain, Marina (MSc.), Department of Life Sciences, Texas A&M – Corpus Christi

Weisend, Rachael (Ph.D.), Department of Life Sciences, Texas A&M – Corpus Christi

Solis, Alex* (MSc.), Department of Life Sciences, Texas A&M – Corpus Christi
Roesler, Elizabeth (Ph.D.), Department of Natural Resources Management, Texas Tech University

*Advisor or Co-Advisor, ^ Graduated

GRADUATE STUDENT AWARDS

Solis, Alex	Society of Freshwater Science Instars Travel Award (2018)
Solis, Alex	Parents' Council Travel Award (2018)
Kinard, Sean	Parents' Council Travel Award (2018)
Kinard, Sean	MARB Research Assistantship (2018-2019)
Whitt, Jennifer	United States Department of Agriculture HSI Research Assistantship (2017-2018)
Whitt, Jennifer	Parents' Council Travel Award (2017)
Whitt, Jennifer	Center for Coastal Studies Research Award (2016)

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

OUTREACH

Media Stories:

-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**
-KRISTV.com, Print article, Spring 2017, Love bugs found in all areas of the coastal bend. Link to article: **http://www.kristv.com/story/35296742/love-bugs-found-in-all-areas-of-the-coastal-bend**
-Press Release, October 2017, TAMU-CC, "A&M- Corpus Christi Scientists Receive $328K to Research Aftermath of Hurricane Harvey"
-The Magazine of the American Society of Landscape Architects, November 2017, "Hurricane grants track the storm this time"
-KRISTV, Television Interview, Fall 2017, TAMUCC receives grant for post-Harvey research on coastal streams. Link to story: **http://www.kristv.com/story/36928263/tamucc-receives-grant-for-post-harvey-research-on-coastal-streams**
- Press Release, January 2018, American Naturalist Highlights our paper "Species pool functional diversity plays a hidden role in generating beta-diversity"

- Third Coast Science for You, Spring 2018, Lab Spotlight: Dr. Christopher Patrick's Aquatic Community and Spatial Ecology Lab
- Third Coast Science for You, Spring 2018, Recovery of coastal streams after Hurricane Harvey
-Port Aransas South Jetty, July 2018, City marina site of MarineGEO study
-Press Release, August 2018, National Academy of Science, Engineering, and Medicine, "Meet the Gulf Research Program 2018 Early-Career Research Fellows!"
- TAMUCC Web Article, September 2018, "Islander Professor Recieves Prestigious Fellowship, plans to use Funding to Support Islander Student Research". Link:http://www.tamucc.edu/news/2018/09/092118_Patrick_Receives_Prestigious_Fellowship.html#.W8if_NNKhaS

Eco-Expert Series Lecture: Oh the many things that creep and crawl. Oso Bay Wetland Center, Fall 2016

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
Indiana Academy of Science 2010 - 2012
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