

## **ALAN P. COVICH**

Odum School of Ecology, University of Georgia, Athens, GA 30602-2202 USA  
Phone: 01-706-542-6006 Fax: 706-542-4819 Email: [alanc@uga.edu](mailto:alanc@uga.edu)

### **EDUCATIONAL BACKGROUND**

1964 A.B. cum laude, Biology, Washington University, St. Louis, Missouri  
1968 M.S. Biology- Ecology, Yale University, New Haven, Connecticut  
1970 Ph.D. Biology- Ecology, Yale University, New Haven, Connecticut

### **PROFESSIONAL APPOINTMENTS**

2003 - Professor, Odum School of Ecology, University of Georgia  
2003 - 2006 Director, Institute of Ecology, University of Georgia  
1998 - 2003 Professor, Fishery and Wildlife Biology, Colorado State University  
1992 - 1998 Head, Fishery and Wildlife Biology, Colorado State University  
1976 - 1992 Professor, Assistant Chair, Zoology, University of Oklahoma  
1971 - 1976 Assistant Professor, Biology, Washington University, St. Louis  
1970 - 1971 NSF Post-Doctoral Fellow, University of California, Santa Barbara  
1968 - 1970 Lecturer, Biology Department, Yale University, New Haven

### **HONORS AND RECOGNITION**

2019 Fellow, Society for Freshwater Science  
2018 Distinguished Ecologist, Colorado State University  
2015 Distinguished Service Award, Ecological Society of America  
2012 Fellow, Ecological Society of America  
2009 President, International Association for Ecology (INTECOL)  
2007 President, Ecological Society of America.  
2003 Fulbright Scholar, University of Coimbra, Portugal  
2001 Visiting Scholar, National Center for Ecological Synthesis and Analysis  
2000 Fellow, American Association for Advancement of Science  
1999 President, American Institute of Biological Sciences  
1997 American Water Resources Association Award of Excellence  
1996 President, North American Benthological Society

### **SYNERGISTIC ACTIVITIES**

Executive Committee of the Tyler Prize for Environmental Achievement (2012-2018), National Advisory Board, National Science Foundation's Macrosystems Program (2018), Long Term Ecological Research Program (2010-12), and the US National Science Foundation's National Ecological Observation Network (NEON) Operations Review Committee (2012), chaired the NSF Blue Ribbon NEON Review Committee (2008-2009) and the NSF Committee of Visitors in Environmental Biology (2009), the NEON Aquatics Research program (2018), as well as service on international review panels (Sweden, Spain, Ireland, Portugal).

## VIDEO PRODUCTION

“In a headwater stream in a protected rainforest...”

["https://player.vimeo.com/video/162427775?color=ffffff"](https://player.vimeo.com/video/162427775?color=ffffff)

## SELECTED PUBLICATIONS: STREAM ECOSYSTEMS

(From over 180 publications- Google Scholar Citations: 15,550, h-Index: 51, i-10 Index: 120)

Corrêa, E.C., F.O. Roque, R.M. Utz, A.C.A. Ribas, B.T. Martínez, G. Daponti, and A.P. Covich. In review. Effects of freshwater fish and decapods on benthic functional feeding groups along a gradient of vegetation loss in karst streams. *Hydrobiologia*.

Corrêa, E.C., F. de Oliveira Roque, R.M. Utz; J. Sousa Corrêa, F. Leandro de Souza, and A.P. Covich. 2018. Effects of macroconsumers on benthic communities: rapid increases in dry-season accrual of calcium in a tropical karst stream. *PLOS One* 13: e0209102.

Smith, C.R., P.V. McCormick, A.P. Covich, and S.W. Golladay. 2017. Comparison of macroinvertebrate assemblages across a gradient of flow-permanence in an agricultural watershed. *River Research and Applications* 33:1428-38.

McKay, S.K, M.C. Freeman, and A.P. Covich. 2016. Application of effective discharge analysis to environmental flow decision making. *Environmental Management* 57:1153-1165.

Pérez-Reyes, O, T.A. Crawl, and A.P. Covich. 2015. Comparison of decapod communities across an urban-forest land use gradient in Puerto Rican streams. *Urban Ecosystems*. DOI:10.1007/s11252-015-00490-4.

Pérez-Reyes, O, T.A. Crawl, and A.P. Covich. 2015. Effects of elevation, food supplies, and water temperature on growth rates of freshwater tropical shrimp in Luquillo Mountains, Puerto Rico. *Freshwater Biology* 60:1514-1524.

Covich, A.P. 2014. Freshwater crustaceans: Adaptations to complex inland habitats and species interactions. Pp. 337-378, In: *Natural History of Crustacea: Life styles and feeding biology of the Crustacea, Volume II*. M. Thiel and L. Watling (eds.), Oxford University Press, Oxford.

Thorp, J.H. and A.P. Covich. 2014. Overview and inland water habitats. Pp. 23-56. In: *Thorp and Covich's Freshwater Invertebrates. Volume I. Ecology and General Biology*. Thorp, J.H. and D.C. Rogers (eds.). Academic Press, Elsevier, Boston.

Rincón, J., and A.P. Covich. 2014. Effects of insect and decapod exclusion and leaf litter species identity on breakdown rates in a tropical headwater stream. *International Journal of Tropical Biology and Conservation* 62: 143-154.

Perez-Reyes, O., T.A. Crawl, P. Hernández-García, R. Ledesma-Fuste, F.A. Villar-Fornes, and A.P. Covich. 2013. Freshwater decapods of Puerto Rico: a checklist and reports of new localities. *Zootaxa* 3717: 329-344.

Hopkinson, C.S., A.P. Covich, C.B. Craft, T.W. Doyle, N. Flanagan, M. Freeman, E.R. Herbert, A. Mehring, J.E. Mohan, C.M. Pringle, C. Richardson. 2013. The effects of climate change on natural ecosystems of the southeastern United States. In: *Climate of the Southeast United States in the National Climate Assessment Regional Technical Input Series* (ed. by K.T. Ingram, K. Dow, L. Carter, and J. Anderson). Island Press, Washington, D.C.

Sun, G., S. Arumugam, P.V. Caldwell, P.A. Conrads, A.P. Covich, J. Cruise, J. Feldt, A.P. Georgakakos, R.T. McNider, S.G. McNulty, D.A. Marion, V. Misra, T. C. Rasmussen, L. Romolo, A. Terando. 2013. Impacts of climate change and variability on water resources in the southeast USA. Pages 210-236, In: *Climate of the southeast United States - Variability, change, impacts and vulnerability*. K.T. Ingram, K. Dow, L. Carter, and J. Anderson (eds.). Island Press, Washington, D.C.

Jones, J.A., I.F. Creed, K.L. Hatcher, R.J. Warren, M.B. Adams, M.H. Benson, E. Boose, W.A. Brown, J.L. Campbell, A.P. Covich, D.W. Clow, C.N. Dahm, K. Elder, C.R. Ford, N.B. Grimm, D.L. Henshaw, K.L. Larson, E.S. Miles, K.M. Miles, S.D. Sebestyen, A.T. Spargo, A.B. Stone, J.M. Vose and M.W. Williams. 2012. Ecosystem Processes and Human Influences Regulate Streamflow Response to Climate Change at Long-Term Ecological Research Sites. *BioScience* 62:390-404.

McDowell, W.H., F.N. Scatena, R.B. Waide, N. Brokaw, G.R. Camilo, A.P. Covich, T.A. Crawl, G. González, E.A. Greathouse, P. Klawinski, D.J. Lodge, A.E. Lugo, C.M. Pringle, B.A. Richardson, M.J. Richardson, D.A. Schaefer, W.L. Silver, J. Thompson, D. Vogt, K. Vogt, R.B. Waide, M. Willig, L. Woolbright, X. Zou, J. K. Zimmerman. 2012. Geographic and Ecological Setting. pp. 21-163, IN: N. Brokaw, T.A. Crawl, A.E. Lugo, W.H. McDowell, F.N. Scatena, R.H. Waide, and M.R. Willig (eds.), *A Caribbean forest tapestry- The multi-dimensional nature of disturbance and response*. Oxford University Press, Oxford, UK.

Brokaw, N., J. Zimmerman, M. Willig, G. Camilo, A. Covich, T. Crawl, N. Fetcher, B. Haines, M. Gannon, J. Lodge, A. Lugo, R. Myster, C. Pringle, J. Sharpe, F. Scatena, T. Schowalter, W. Silver, J. Thompson, D. Vogt, K. Vogt, R. Waide, L. Walker, L. Woolbright, J. Wunderle, X. Zou. 2012. Response to Disturbance. Pp. 201-271 IN: N. Brokaw, T.A. Crawl, A.E. Lugo, W.H. McDowell, F.N. Scatena,

R.H. Waide, and M.R. Willig (eds.), A Caribbean forest tapestry- The multi-dimensional nature of disturbance and response. Oxford University Press, Oxford, UK.

Crowl, T.A., N. Brokaw, R.B. Waide, G. González, K. Beard, E. Greathouse, A.E. Lugo, A. P. Covich, D. J. Lodge, C. Pringle, J. Thompson, and G.E. Belovsky. 2012. When and where biota matter: Linking disturbance regimes, species characteristics and dynamics of communities and ecosystems. pp. 272-304, IN: N. Brokaw, T.A. Crowl, A.E. Lugo, W.H. McDowell, F.N. Scatena, R.H. Waide, and M.R. Willig (eds.), A Caribbean forest tapestry- The multi-dimensional nature of disturbance and response. Oxford University Press, Oxford, UK.

Willig, M.R., C.P. Bloch, A.P. Covich, C. A. S. Hall, D. J. Lodge, A.E. Lugo, W.L. Silver, R. B. Waide, L.R. Walker, and J.K. Zimmerman. 2012. Long-term Research in the Luquillo Mountains: Synthesis and Foundations for the Future. pp. 361-441, IN: N. Brokaw, T.A. Crowl, A.E. Lugo, W.H. McDowell, F.N. Scatena, R.H. Waide, and M.R. Willig (eds.), A Caribbean forest tapestry- The multi-dimensional nature of disturbance and response. Oxford University Press, Oxford, UK.

Hein, C.L., A.S. Pike, J.F. Blanco, A.P. Covich, F.N. Scatena, C.P. Hawkins, and T.A. Crowl. 2011. Effects of coupled natural and anthropogenic factors on the community structure of diadromous fish and shrimp species in tropical island streams. *Freshwater Biology* 56: 1002-1015.

Atkinson, C.L., M.R. First, A.P. Covich, S.P. Opsahl and S.W. Golladay. 2011. Suspended material availability and filtration-biodeposition processes performed by a native and invasive bivalve species in streams. *Hydrobiologia* 667: 191-204.

Sargent, L.W., S.W. Golladay, A.P. Covich, and S.P. Opsahl. 2011. Physiochemical habitat association of a native and a non-native crayfish in the lower Flint River, Georgia: implications for invasion success. *Biological Invasions* 13: 499-511.

Atkinson, C.L., S.P. Opsahl, A.P. Covich, S.W. Golladay, and L.M. Conner. 2010. Stable isotopic signatures, tissue stoichiometry, and nutrient cycling (C and N) of native and invasive freshwater bivalves. *Journal of the North American Benthological Society* 29: 496-505.

Covich, A.P. 2010. Winning the biodiversity arms race among freshwater gastropods: competition and coexistence through shell variability and predator avoidance. *Hydrobiologia* 653: 191-215.

Covich, A.P. 2010. Adaptation to sustain high-quality freshwater supplies in response to climatic change. *Resources For the Future Issue Brief* 10-05:1-22.

Covich, A.P., J.H. Thorp, and D.C. Rogers. 2010. Introduction to the subphylum Crustacea. pp. 695-723 IN: J.H. Thorp and A.P. Covich (eds.). Ecology and classification of North American freshwater invertebrates, 3rd edition, Academic Press, New York.

Thorp, J.H., A.P. Covich, and W.W. Dimmick. 2010. Introduction to invertebrates of inland waters. pp. 1-23, IN: J.H. Thorp and A.P. Covich (eds.). Ecology and classification of North American freshwater invertebrates, 3rd edition, Academic Press, New York.

Thorp, J.H. and A.P. Covich. 2010. An overview of inland aquatic habitats. pp. 25-47, IN: J.H. Thorp and A.P. Covich (eds.). Ecology and classification of North American freshwater invertebrates, 3rd edition, Academic Press, New York.

Benstead, J.P., W.F. Cross, J.G. March, W.H. McDowell, A. Ramirez, and A.P. Covich. 2010. Biotic and abiotic controls on the ecosystem significance of consumer excretion in two contrasting tropical streams. *Freshwater Biology* 55: 2047-2061.

McKay, S.K., B.A. Pruitt, M. Harberg, A.P. Covich, M.A. Kenney, and J.C. Fischenich. 2010. Metric development for environmental benefits analysis. ERDC TN-EMRRP-EBA-04. Ecosystem Management and Restoration Research Program, Army Engineer Research and Development Center, Vicksburg, MS.

Covich, A.P., T A. Crowl, C. L. Hein, M.J. Townsend, and W. H. McDowell. 2009. Importance of geomorphic barriers to predator–prey interactions in river networks. *Freshwater Biology* 54:450-465.

Kikkert, D.A., T.A. Crowl, and A.P. Covich. 2009. Upstream migration of amphidromous shrimp in the Luquillo Experimental Forest, Puerto Rico: temporal patterns and environmental cues. *Journal of the North American Benthological Society* 28:233-246.

Covich, A.P. 2009. Freshwater ecology. Pp. 343-347, IN: Encyclopedia of islands. Gillespie, R.G. and D. A. Clague, (eds.) University of California Press. Berkeley.

Covich, A.P. 2009. Emerging climate change impacts on freshwater resources. Resources for the Future. Washington, D.C. [<http://www/rff.org/rff-documents-RFF-Rpt-Adaptation-Covich.pdf>]

Covich, A.P. 2009. Biodiversity of aquatic ecosystems, IN: Encyclopedia of Inland Waters, vol. 1: 379-386. Likens, G.E. (ed.). Elsevier, Amsterdam.

Atkinson, C.L., S.W. Golladay, S. P. Opsahl and A.P. Covich. 2009. Stream discharge and floodplain connections affect seston quality and stable isotopic

signatures in a coastal plain stream. *Journal of the North American Benthological Society* 28: 360-370.

Cross, W.F., A.P. Covich, T.A. Crowl, J.P. Benstead, and A. Ramirez. 2008. Secondary production, longevity, and consumption rates of freshwater shrimps in two tropical streams with contrasting geomorphology and foodweb structure. *Freshwater Biology* 53: 2504-2519.

Hopkinson, C., A. E. Lugo, M. Alber, A. P. Covich, S. J. Van Bloem. 2008. Forecasting effects of sea-level rise and windstorms on coastal and inland ecosystems. *Frontiers in Ecology and Environment* 6: 255-263.

Malmqvist, B., S.D. Rundle, A.P. Covich, A.G. Hildrew, C.T. Robinson, and C.R. Townsend. 2008. Prospects for streams and rivers: An ecological perspective. Chapter 2, pp. 19-29, IN: *Aquatic ecosystems- Trends and global prospects*. N.V.C. Polunin (ed.), Cambridge University Press, Cambridge, UK.

Boulton, A.J., L. Boyero, A.P. Covich, M. Dobson, S. Lake, and R. Pearson. 2008. Are tropical streams ecologically different from temperate streams? Chapter 9, pp. 257-284, IN: D. Dudgeon (ed.) *Tropical Stream Ecology*. Academic Press, San Diego.

Peters, D.P.C., O.E. Sala, C.D. Allen, A.P. Covich, M. Brunson. 2007. Cascading events in linked ecological and social-economic systems: Predicting change in an uncertain world. *Frontiers in Ecology and Environment* 5:221-224.

Zimmerman, J. K.H. and A.P. Covich. 2007. Damage and recovery of riparian sierra palms (*Prestoea acuminata* var. *montana*) after Hurricane Georges: Influence of topography, land use, and biotic characteristics. *Biotropica* 39: 43-49.

Covich, A.P. 2006. Protecting benthic biodiversity to insure detrital processing and ecosystem services: Importance of invertebrate shredders in stream networks. *Ecotropicos* 19: 109-127.

Covich, A.P. 2006. Dispersal-limited biodiversity of tropical insular streams. *Polish Journal of Ecology* 54: 523-547.

Covich, A.P., T.A. Crowl, and T. Heartsill-Scalley. 2006. Effects of drought and hurricane disturbances on headwater distributions of palaemonid river shrimp (*Macrobrachium* spp.) in the Luquillo Mountains, Puerto Rico. *Journal of the North American Benthological Society* 25: 99-107.

Crowl, T.A., V. Welsh, T. Heartsill-Scalley, A.P. Covich. 2006. Effects of different types of conditioning on leaf-litter shredding by *Xiphocaris elongata*, a Neotropical freshwater shrimp. *Journal of the North American Benthological Society* 25: 196-206.

Covich, A.P. 2005. Ecosystem processes. Pp. 1535-156, IN: M.G. Anderson and J.J. McDonnell (eds.). Encyclopedia of Hydrological Sciences, John Wiley and Sons, New York.

Heal, G.M., E.B. Barbier, K.J. Boyle, A.P. Covich, S.P. Gloss, C.H. Hershler, J.P. Hoehn, C.M. Pringle, S. Polasky, K. Segerson, and K. Shrader-Frechette. 2005. Valuing Ecosystem Services: Toward Better Environmental Decision-Making. National Research Council, Washington, D.C.

Wall, D.H., E. Ayres, V. Behan-Pelletier, A.P. Covich and P. V. R. Snelgrove. 2005. Soil, freshwater, and marine ecosystems: The need for integrative landscape science. Marine Ecology Progress Series 304: 271-307.

Wright, M.S. and A. P. Covich. 2005. The effect of macroinvertebrate exclusion on leaf breakdown rates in a tropical headwater stream. Biotropica 37: 403-408.

Wright, M.S. and A.P. Covich. 2005. Relative importance of bacteria and fungi in a tropical headwater stream: Leaf decomposition and invertebrate feeding preference. Microbial Ecology 20: 1-11.

Beard, K.H., K.A. Vogt, D.J. Vogt, F.N. Scatena, A. P. Covich, R. Sigurdardottir, T.C. Siccama, and T.A. Crowl. 2005. The response of structural and functional characteristics of a tropical forested ecosystem to multiple, natural disturbances in legacy environments. Ecological Monographs 75:345-361.

Cooney, S.J., A.P. Covich, P.M. Lukacs and K. Fausch. 2005. Modeling global warming scenarios in greenback cutthroat trout (*Oncorhynchus clarki stomias*) streams: Implications for species recovery. Western North American Naturalist 65: 371-381.

Covich, A.P., K.C. Ewel, R.O. Hall, P.G. Giller, D. M. Merritt, and W. Goedkoop. 2004. Ecosystem services provided by freshwater benthos. Chapter 3, pp.45-72, IN: D. H. Wall (ed.) Sustaining Biodiversity and Ecosystem Services in Soils and Sediments. Island Press, Washington, D.C.

Giller, P.S., A.P. Covich, K.C. Ewel, R.O. Hall, Jr., and D.M. Merritt. 2004. Vulnerability and management of ecological services in freshwater systems. Pp. 137-159 IN: D. Wall (ed.) Sustaining Biodiversity and Ecosystem Services in Soils and Sediments. Island Press, Washington, D.C.

Covich, A.P., M.C. Austen, F. Barlocher, E. Chauvet, B.J. Cardinale, C.L. Biles, P. Inchausti, O. Dangles, M. Solan, M.O. Gessner, B. Statzner and B. Moss. 2004. The role of biodiversity in the functioning of freshwater and marine benthic ecosystems. BioScience 54: 767-775.

Smith, G.C., A.P. Covich, and A.M.D. Brasher. 2003. An ecological perspective on the biodiversity of tropical island streams. *BioScience* 53: 1048-1051.

Covich, A.P., T.A. Crowl, and F.N. Scatena. 2003. Effects of extreme low flows on freshwater shrimps in a perennial tropical stream. *Freshwater Biology* 48: 1199-1206.

Larned, S.T., R.A. Kinzie III, A.P. Covich, and C.T. Chong. 2003. Detritus processing by endemic and non-native Hawaiian stream invertebrates: A microcosm study of species-specific effects. *Archiv für Hydrobiologie* 156: 241-254.

Iwata, T., M. Inoue, S. Nakano, H. Miyasaka, A. Doi, and A.P. Covich. 2003. Shrimp abundance and habitat relationships in tropical rain-forest streams, Sarawak, Borneo. *Journal of Tropical Ecology* 19: 387-395.

Pyron, M. and A.P. Covich. 2003. Migration patterns, densities, and growth of *Neritina punctulata* snails in Rio Espiritu Santo and Rio Mameyes, Northeastern Puerto Rico. *Caribbean Journal of Science* 39: 338-347.

Zimmerman, J.K.H. and A.P. Covich. 2003. Distribution of juvenile crabs (*Epilobocera sinuatifrons*) in two Puerto Rican headwater streams: Effects of pool morphology and past land-use legacies. *Archiv für Hydrobiologie* 158: 343-357.

Covich, A.P. and 16 co-authors. 2003. Natural ecosystems: Aquatic Systems. Pp. 185- 205 IN: Preparing for a changing climate. The potential consequences of climate variability and change. Rocky Mountain/Great Basin. F.H. Wagner (ed.) Report for the U.S. Global Change Research program, Utah State University, Logan.

Covich, A.P. and T.A. Crowl. 2002. Reorganization of benthic stream food webs in response to drought-altered population densities: Effects on rainforest streams. *Verhandlungen der Internationale Vereinigung für Theoretische und Angewandte Limnologie* 28: 1172-1175.

Crowl, T.A., A.P. Covich, F.N. Scatena, R. Phillips, M.J. Townsend, and D.K. Vinson. 2002. Particulate organic matter dynamics in tropical headwater streams: A comparison of biotic and abiotic factors. *Verhandlungen der Internationale Vereinigung für Theoretische und Angewandte Limnologie* 28: 923-927.

Townsend, M.J., T.A. Crowl, R. Phillips, A.P. Covich, and F.N. Scatena. 2002. Indirect and direct abiotic controls on a species-poor stream insect assemblage. *Verhandlungen der Internationale Vereinigung für Theoretische und Angewandte Limnologie* 28: 919-922.



Wall, D.H, P.V.R. Snelgrove, and A.P. Covich. 2001. Conservation priorities for soil and sediment invertebrates. Pages 99-123 IN: M.E. Soule and G.H. Orians (eds.) Conservation Biology: Research priorities for the next decade. Island Press.

Heartsill-Scalley, T., T.A. Crowl, M. Townsend, and A.P. Covich. 2001. Freshwater shrimp population structure and distribution dynamics in a tropical rainforest stream. Pp. 732-735 IN: K.N. Ganeshiah, R. U. Shaanker, K.S. Bawa (eds.) Tropical ecosystems: Structure, diversity and human welfare. Oxford and IBH Publishing, New Delhi.

Thorp, J. H. and A. P. Covich (eds.) 2001. Ecology and Classification of North American Freshwater Invertebrates, 2nd edition. Academic Press, New York.

Crowl, T.A., W.H. McDowell, A.P. Covich, and S.L. Johnson. 2001. Species-specific responses in leaf litter processing in a tropical headwater stream (Puerto Rico). *Ecology* 82: 775-783.

Lake, P.S., M.A. Palmer, P. Biro, J. Cole, A. P. Covich, C.N. Dahm, J. Gibert, W. Goedkoop, K. Martens, J.T.A. Verhoeren. 2000. Global change and the biodiversity of freshwater ecosystems: Impacts on linkages between above-sediment and below-sediment biota. *BioScience* 50: 1099-1107.

Chong, C.T., S.T. Larned, A.P. Covich, and R.A. Kinzie III. 2000. Species interactions between estuarine detritivores: Inhibition or facilitation? *Hydrobiologia* 434: 11-16.

Covich, A.P. 2000. Energy flow and ecosystems. IN: S.A. Levin (ed.) *Encyclopedia of Biodiversity*, vol. 2: 509-523. Academic Press, San Diego, CA.

Palmer, M.A., A.P. Covich, S. Lake, P. Biro, J.J. Brooks, J. Cole, C. Dahm, W., J. Gibert, Goedkoop, K. Martens, J. Verhoeven and W. van de Bund. 2000. Linkages between aquatic sediment biota and life above sediments as potential drivers of biodiversity and ecological processes. *BioScience* 50: 1062-1075.

Johnson, S.L. and A.P. Covich. 2000. The importance of night-time observations for determining habitat preferences of stream biota. *Regulated Rivers - Research and Management* 16: 91-99.

O'Connor, P.J., A.P. Covich, F.N. Scatena, and L.L. Loope. 2000. Non-indigenous bamboo along headwater streams of the Luquillo Mountains, Puerto Rico: Leaf fall, aquatic leaf decay and patterns of invasion. *Journal of Tropical Ecology* 16: 499-516.

Covich, A.P., T.A. Crowl, and F.N. Scatena. 2000. Linking habitat stability to floods and droughts: Effects on shrimp in montane streams, Puerto Rico.

Verhandlungen der Internationale Vereinigung für Theoretische und Angewandte Limnologie 27: 2430-2434.

Crowl, T.A., N. Bouwes, M.J. Townsend, A.P. Covich, and F.N. Scatena. 2000. Estimating the potential role of freshwater shrimp on an aquatic insect assemblage in a tropical headwater stream: A bioenergetics approach. Verhandlungen der Internationale Vereinigung für Theoretische und Angewandte Limnologie 27: 2403-2407.

Covich, A.P. 2000. Litter processing in tropical headwater streams: Potential importance of palm fruit fall and frond fall. Korean Journal of Ecology 23: 113-116.

Loomis, J., P. Kent, L. Strange, K. Fausch, and A. Covich. 2000. Measuring the total economic value of restoring ecosystem services in an impaired river basin; Results from a contingent valuation survey. Ecological Economics 33: 103-117.

Strange, E. M., K. D. Fausch, and A. P. Covich. 1999. Sustaining ecosystem services in human-dominated watersheds: Biohydrology and ecosystem processes in the South Platte River Basin. Environmental Management 24: 39-54.

Covich, A.P., M.A. Palmer, and T.A. Crowl. 1999. The role of benthic invertebrate species in freshwater ecosystems – Zoobenthic species influence energy flows and nutrient cycling. BioScience 49: 119-127.

Pyron, M., A.P. Covich, and R.W. Black. 1999. On the relative importance of pool morphology and woody debris to distributions of shrimp in a Puerto Rican headwater stream. Hydrobiologia 405: 207-215.

Covich, A.P. 1999. Leaf litter processing: The importance of species diversity in stream ecosystems. IN: N. Friberg and J.D. Carol (eds.) Biodiversity in benthic ecology. Proceedings from the Nordic Benthological Meeting, Pp. 15-20. National Environmental Research Institute, Silkeborg, Denmark.

Covich, A.P. 1999. The effects of disturbances on litter processing of native and non-native riparian species in tropical headwater streams. IN: Proceedings of the 3rd International Conference on Long Term Ecological research in the East Asia-Pacific Region. Pp. 53-64. Korea Research Foundation and U.S. National Science Foundation, Seoul, Korea.

Covich, A.P., T.A. Crowl, S.L. Johnson, and F.N. Scatena. 1998. Drought effects on pool morphology and Neotropical stream benthos. Pp.91-96 IN: Tropical Hydrology and Caribbean Water Resources, Proceedings of the Third International Symposium on Water Resources, R.I. Segarra-Garcia (ed.). Technical Publication Series 98-2, American Water Resources Association, Herndon, VA

Johnson, S.L., A.P. Covich, T.A. Crowl, A. Estrada- Pinto, J. Bithorn, and W.A. Wurtsbaugh. 1998. Do seasonality and disturbance influence reproduction in freshwater atyid shrimp in headwater streams, Puerto Rico? *Verhandlungen der Internationale Vereinigung für Theoretische und Angewandte Limnologie* 26: 2076-2981.

Lodge, D.M., R.A. Stein, K.M. Brown, A.P. Covich, C. Bronmark, and J.E. Garvey. 1998. Predicting impact of freshwater exotic species on native biodiversity: Challenges in spatial scaling. *Australian Journal of Ecology* 23: 53-67.

Covich, A.P. and F.J. Swanson. 1998. Ecosystem linkages of forests and headwaters: Long-term studies of natural and cultural disturbances of tropical and temperate montane forests. *Proceedings of the 2nd Conference on Long Term Ecological Research in the East Asia-Pacific region: Biodiversity and conservation of terrestrial and freshwater ecosystems*. Center for Global Environmental Research, National Institute for Environmental Studies, Tsukuba, Japan.

Johnson, S.L. and A.P. Covich. 1997. Scales of distribution of riparian forests and distributions of suspended detritus. *Freshwater Biology* 37: 163-175.

Palmer, M.A., A.P. Covich, B. Finlay, J. Gilbert, K.D. Hyde, R.K. Johnson, T. Kairesalo, P.S. Lake, C.R. Lovell, R.J. Naiman, C. Ricci, F.F. Sabatier, and D.L. Strayer. 1997. Biodiversity and ecosystem processes in freshwater sediments. *Ambio* 26: 571-577.

Covich, A. P., S.C. Fritz, P.J. Lamb, R.D. Marzolf, W.J. Matthews, K.A. Poiani, E.E. Prepas, M.B. Richman, and T.C. Winter. 1997. Potential effects of climate change on aquatic ecosystems of the Great Plains of North America. *Hydrological Processes* 11: 993-1021.

Covich, A.P., T.A. Crowl, S.L. Johnson, and M. Pyron. 1996. Distribution and abundance of tropical freshwater shrimp along a stream corridor: Response to disturbance. *Biotropica* 28: 484-492.

Covich, A.P. and W.H. McDowell. 1996. The stream community. Pp.433-459 IN: D.P. Reagan and R.B. Waide (eds.) *The food web of a tropical rain forest*. University of Chicago Press, Chicago.

Vogt, K.A. D.J. Vogt, P. Boon, A.P. Covich, F.N. Scatena, H. Asbjornsen, J.L. O'Hara, J. Perezx, T.G. Siccama, J. Bloomfield, and J.R. Ranciato. 1996. Litter dynamics along stream, riparian and upslope areas following Hurricane Hugo, Luquillo Experimental Forest, Puert Rico. *Biotropica* 28: 458-470.

Varza, D. and A.P. Covich. 1995. Population fluctuations within a spring community. *Journal of the Kansas Entomological Society* 68: 42-49.

Covich, A.P., W.H. Clements, K.D. Fausch, J.D. Stednick, J. Wilkins-Wells, S.R. Abt. 1995. Ecological integrity and western water management: A Colorado perspective. *Water in the Balance* 3: 1-23.

Crowl, T.A. and A.P. Covich. 1994. Responses of a freshwater shrimp to chemical and tactile stimuli from a large decapod predator. *Journal of the North American Benthological Society* 13: 291-298.

Covich, A.P., T.A. Crowl, J.E. Alexander, and C.C. Vaughn. 1994. Predator-avoidance responses in freshwater decapod-gastropod interactions mediated by chemical stimuli. *Journal of the North American Benthological Society* 13: 291-298.

Dodson, S.I., T.A. Crowl, B.L. Peckarsky, L.B. Kats, A.P. Covich, and J.M. Culp. 1994. Non-visual communication in freshwater benthos: An overview. *Journal of the North American Benthological Society* 13: 268-282.

Webster, J.R., A.P. Covich, J.L. Tank, and T.V. Crockett. 1994. Retention of coarse organic particles in streams in the southern Appalachian Mountains. *Journal of the North American Benthological Society* 13: 140-150.

Lodge, D.M., M.W. Kershner, J.E. Aloï, and A.P. Covich. 1994. Effects of an omnivorous crayfish (*Orconectes rusticus*) on a freshwater littoral food web. *Ecology* 75: 1265-1281.

Covich, A.P. 1993. Water and ecosystems. Pp. 40-50 IN: *Water in crisis: a guide to the world's freshwater resources*. P.H. Geick (ed.) Oxford University Press.

Pringle, C.M., G.A. Blake, A.P. Covich, K.M. Buzby, and A. Finley. 1993. Effects of omnivorous shrimp in a montane tropical stream – sediment removal, disturbance of sessile invertebrates and enhancement of understory algal biomass. *Oecologia* 93: 1-11.

Covich, A.P., J.D. Allan, T. Arsuffi, A.C. Benke, C.E. Cushing and 17 others. 1992. Report of the Freshwater Imperative Working Group. *Bulletin of the North American Benthological Society* 9: 266-271.

Covich, A.P., T.A. Crowl, S.L. Johnson, D. Varza and D.L. Certain. 1991. Post-hurricane Hugo increases in atyid shrimp abundance in a Puerto Rican montane stream. *Biotropica* 23: 448-454.

Alexander, J.E. and A.P. Covich. 1991. Predator avoidance in the freshwater snail *Physella virgata* to the crayfish *Procambarus simulans*. *Oecologia* 87: 435-442.

Alexander, J.E. and A.P. Covich. 1991. Predation risk and avoidance behavior in two freshwater snails. *Biological Bulletin* 180: 387-393.

Thorp, J.H. and A.P. Covich (eds.). 1991. *Ecology and classification of North American freshwater invertebrates*. Academic Press, New York.

Covich, A.P. and T.A. Crowl. 1990. Effects of Hurricane Hugo storm flow on transport of woody debris in a rain forest stream (Luquillo Experimental Forest, Puerto Rico). Pp. 197-205, IN: *Tropical Hydrology and Caribbean Water Resources*, American Water Resources Association, Bethesda, MD.

Crowl, T.A. and A.P. Covich. 1990. Predator-induced life-history shifts in a freshwater snail. *Science* 247: 949-951.

Crowl, T.A., C.R. Townsend, and A.P. Covich. 1990. Hierarchical design and the use of Geographic Information Systems to bridge the gap between river science and management. Pages 27-33, IN: *Proceedings of the Second Annual Colloquium of the Spatial Information Research Centre* (G.L. Benwell, ed.). University of Otago, Dunedin, New Zealand.

Covich, A.P. 1988. Geographical and historical comparisons of neotropical streams: Biotic diversity and detrital processing in highly variable habitats. *Journal of the North American Benthological Society* 7: 361-386.

Stanford, J.A. and A.P. Covich. 1988. Preface: Community structure and function in temperate and tropical streams. *Journal of the North American Benthological Society* 7: 261-263.

Covich, A.P. 1988. Atyid shrimp in the headwaters of the Luquillo Mountains, Puerto Rico: Filter feeding in natural and artificial streams. *Verhandlungen der Internationale Vereinigung für Theoretische und Angewandte Limnologie* 23: 2108-2113.

Resh, V.H., A.V. Brown, A.P. Covich, M.E. Gurtz, H.W. Li, and G.W. Minshall. 1988. The role of disturbance in stream ecology. *Journal of the North American Benthological Society* 7: 433-455.

Covich, A.P. 1976. Analyzing shapes of foraging areas: Some ecological and

## **ADDITIONAL ECOLOGICAL PUBLICATIONS**

Shivers, S.D., S.W. Golladay, M.N. Waters, S.B. Wilde, P.D. Ashford, and A.P. Covich. 2018. Rivers to reservoirs: Hydrological drivers control reservoir function

by affecting the abundance of submerged and floating macrophytes. *Hydrobiologia* 815:21-35.

Marzolf, N., S. Golladay, P. McCormick, A. Covich, and S. Wild, 2018. Inter- and intra-annual apple snail egg mass dynamics in a large southeastern US reservoir. *Hydrobiologia* 811:155-171.

Shivers, S.D., S.W. Golladay, M.N. Waters, S.B. Wilde, P.D. Ashford, and A.P. Covich. 2017. Changes in submerged aquatic vegetation (SAV) coverage caused by extended drought and flood pulses. *Lake and Reservoir Management* 34:218-229.

Covich, A.P. 2017. Frank Golley's perspectives on environmental ethics and literacy: How to avoid irreversible impacts of hydro-power and inter-oceanic canal development on Meso-American tropical ecosystems? *Human Ecology Review* 23:39-53.

Czaja, A., J.L. Estrada-Rodríguez, U. Romero-Méndez, V. Ávila-Rodríguez, I.G. Meza-Sánchez, and A.P. Covich. 2017. New species and records of phreatic snails (Caenogastropoda: Cochliopidae) from the Holocene of Coahuila, Mexico. *Archiv für Molluskenkunde-International Journal of Malacology* 146:227-232.

Huete-Pérez, J.A., M. Ortega-Hegg, G.R. Urquhart, A.P. Covich, K. Vammen, B.E. Rittmann, J. C. Miranda, S. Espinoza-Corriols, A. Acevedo, M.L. Acosta, J.P. Gómez, M.T. Brett, M. Hanemann, A. Härer, J. Incer-Barquero, F.J. Joyce, J.W. Lauer, J.M. Maes, M.B. Tomson, A. Meyer, S. Montenegro-Guillén, W. L. Whitlow, J. L. Schnoor, P. J.J. Alvarez. 2016. Critical uncertainties and gaps in the Environmental and Social Impact Assessment of the proposed interoceanic canal through Nicaragua. *BioScience* 66:632-645.

Shivers, S.D., S.P. Opsahl, and A.P. Covich. 2016. Microbial bioavailability of dissolved organic carbon from leachates of freshwater autotrophs. *Aquatic Microbial Ecology* 76: 233-241.

Golladay, S.W., K.L. Martin, J.M. Vose, D.N. Wear, A.P. Covich, R.J. Hobbs, K.D. Klepzig, G.E. Likens, R.J. Naiman, and A.W. Shearer. 2016. Achievable future conditions as a framework for guiding forest conservation and management. *Forest Ecology and Management* 360:80-96.

Marzolf, N.S., Golladay, S.W., Covich, A.P. 2016. Is environmental calcium availability limiting dispersal of an invasive snail in Lake Seminole and associated smaller lakes? *Proceedings of the Georgia Water Resources Conference*. Athens, Georgia.

Patton, D., J.C. Bergstrom, R. Moore, and A.P. Covich. 2015. Economic value of carbon storage in US National Wildlife Refuge wetland ecosystems. *Ecosystem Services* 16:94-104.

Huete-Pérez, J. P. Alvarez, J. Schnoor, B. Rittmann, A. Clayton, M. Acosta, C.E. Bicudo, M. Kalin Arroyo, M. Brett, V. Campos, H. Chaimovich, A.P. Covich, B. Jimenez-Cisneros, L. Lacerda, J.-M. Maes, J. Miranda, S. Montenegro Guillen, M. Ortega Hegg, G. Urquhart, K. Vammen, L. Zambrano Gonzalez. 2015. Scientists raise alarms about fast tracking of transoceanic canal through Nicaragua. *Environmental Science and Technology* 49: 3989-3996.

Covich, A.P. 2015. Frank Golley: Interdisciplinary insights for a 21st century Earth stewardship, pp. 431-450, In: *Earth stewardship: Linking ecology and ethics in theory and praxis*, R. Rozzi, S.T.A. Pickett, J.B. Callicott, T. Chapin, J.J. Armesto and M.E. Power (eds.). Springer, New York.

Covich, A.P. 2015. Projects that never happened: Ecological insights from Darien, Panama. *Bulletin of the Ecological Society of America*.96:54-63.

Barfield, A.S., J.C. Bergstrom, S. Ferreira, A.P. Covich, and K.S. Delaplane. 2015. An economic valuation of biotic pollination services in Georgia. *Journal of Economic Entomology* 108:388-398.

Smith, C.R., P.V. McCormick, S.W. Golladay, and A.P. Covich. 2015. Invertebrate assemblage changes indicative of reduced flow in an agricultural watershed. *Proceedings of the Georgia Water Resources Conference*, Athens, GA.

Rasser, M.W. and A.P. Covich. 2014. Predation on freshwater snails in Miocene Lake Steinheim: A trigger for intra-lacustrine evolution. *Lethaia* 47: 524-532.

Young, G.B., S.W. Golladay, A.P. Covich, and M.S. Blackmore. 2014. Nutrient enrichment affects immature mosquito abundance and species composition in field-based mesocosms in the coastal plain of Georgia. *Environmental Entomology* 43: 1-8.

Young, G.B., S.W. Golladay, A.P. Covich, and M.S. Blackmore. 2014. Stable isotope analysis of larval mosquito diets in agricultural wetlands in the coastal plain of Georgia, USA. *Journal of Vector Ecology* 39: 288-297.

Botello, G.M., S. Golladay, A.P. Covich, and M. Blackmore. 2013. Immature mosquitoes in agricultural wetlands of the coastal plain of Georgia, U.S.A.: Effects of landscape and environmental habitat characteristics. *Ecological Indicators* 34: 304 - 312.

Patton, D.A., R.L. Moore, J.C. Bergstrom, and A.P. Covich. 2013. A meta-analysis of ecosystem services associated with wetlands in USFWS National Wildlife Refuges. Proceedings of the 2013 Georgia Water Resources Conference.

Patton, D.A., J.C. Bergstrom, A.P. Covich, and R.L. Moore. 2012 (revised 2013). National Wildlife Refuge Wetland Ecosystem Service Valuation Model, Phases 1A, 1B, Final Report: An Assessment of Ecosystem Services Associated with National Wildlife Refuges. Division of Economics and Division of Refuges, Cooperative Ecosystem Studies Unit (Piedmont), U.S. Fish and Wildlife Service, Washington, DC.

Buckner, E.A., M.S. Blackmore, S.W. Golladay, and A.P. Covich. 2011. Weather and landscape factors associated with adult mosquito abundance in southwestern Georgia, U.S.A. *Journal of Vector Ecology* 36:269-278.

Grimm, N.B., A. P. Covich, and J. M. Melillo. 2006. A vision for ecology's future: where are we today? *Frontiers in Ecology and the Environment* 4: 115.

Melillo, J.M., N.B. Grimm, and A.P. Covich. 2005. NEON: lighting the way forward. *Frontiers in Ecology and the Environment* 3: 351.

Levin, L.A., D.F. Bosch, J. Brim Box, A. Covich, C. Dahm, C. Erseus, K.C. Ewel, R.T. Kneib, A. Moldenke, M.A. Palmer, P. Snelgrove, D. Strayer, J.M. Weslawski. 2001. The function of biodiversity of marine critical transition zones and the importance of sediment biodiversity. *Ecosystems* 4: 430-451.

Adams, G.A., D.H. Wall, and A.P. Covich. 1999. Linkages between below-surface and above-surface biodiversity. *Bulletin of the Ecological Society of America* 80: 200-204.

Dunning, N., D.J. Rue, T. Beach, A. Covich, and A. Traverse. 1998. Human-environment interactions in a tropical watershed: The paleoecology of Laguna Tamarindito, El Peten, Guatemala. *Journal of Field Archeology* 25: 1-14.

Covich, A.P. 1998. Public participation in water resource decisions. *Colorado Water* 15 (6): 20-23.

Bradbury, J.P. R.M. Forester, and A.P. Covich. 1991. Paleolimnology of Laguna de Cocos, Albion Island, Rio Hondo, Belize. Pages 119-154, IN: *Ancient Maya wetland agriculture* (E. Pohl, ed.) Westview Press, Boulder, Colorado.

Covich, A.P. 1987. Optimal use of space by neighboring central-place foragers. *Advances in Behavioral Economics* 1: 249-294.



## **PUBLICATIONS (In Review)**

Czaja, A., A.P. Covich, J.L. Estrada-Rodríguez, U. Romero-Méndez, and J.A. Torres Mesta. In review. A new highly polymorphic species of freshwater snail *Pyrgophorus* (Caenogastropoda: Truncatelloidea: Cochliopidae) from late Holocene spring deposits in Viesca, Coahuila, Mexico - Shell morphology as an anti-predator adaptation.

Czaja, A., J.L. Estrada-Rodríguez, U. Romero-Méndez, I.G. Meza-Sánchez, V. Ávila-Rodríguez, J. Saenz-Mata, J. L. Becerra-López, D. Aguillón, A. P. Covich. In review. A new species and new records of freshwater snails from sub-fossil deposits of northern Mexico – A case of a “silent local extinction.

## **TEACHING PERSPECTIVE**

Students learn best by first-hand experience in conducting integrated laboratory and field studies. The framing of multiple, testable hypotheses and the collecting and analyzing data to determine the outcome of species interactions results in an in-depth appreciation of both ecological and evolutionary biology concepts. The environmental context sets the stage of the range of coupled interactions that affect species populations, communities, and ecosystem processes. Critical thinking and analysis is reinforced by careful reviews of the primary ecological literature. Recently developed animations, interactive computer simulations, and online visualizations are increasingly effective in conveying the complexity of ecological dynamics and engage students.

## **TEACHING AWARDS**

2014 University of Georgia Excellence in Teaching Award

2004 UGA Institute of Ecology Graduate Student Appreciation Award

## **COURSE EVALUATIONS**

Student rankings have consistently been in the range of 4 to 5 on a scale of 1 to 5 for online evaluations in response to questions: “This course challenged me to think and to learn; The instructor facilitates critical thinking.” I use a mid-term evaluation to determine what students find more effective and least effective to obtain feed back during each course. Enrollments in these courses range from 10 to 120 students.

## **TEACHING EXPERIENCE**

Organized curricular diversification and expansion in the undergraduate and graduate program for the UGA Institute of Ecology. Helped develop courses for undergraduate (ECOL. 3400, ECOL 3500, ECOL 4310) and graduate students (ECOL 6310, ECOL 8000, ECOL 8220, ECOL 8230) while Director of the

Institute of Ecology. I have mentored 28 M.S. and 10 PhD students and served on more than 35 graduate committees.

**2009-2018:** University of Georgia- ECOL 1000H (The Ecological Basis for Environmental Issues, Honors), ECOL 3500 (Introduction to Ecology); ECOL 3505H (Honors Ecology), ECOL 3400 (Careers in Ecology), ECOL 4310/6310 Aquatic Ecosystem Ecology, ECOL 4960H (Honors Research); ECOL 8000 (Topics in Modern Ecology); ECOL 8220 (Stream Ecology); ECOL 8230 (Lake Ecology); ECOL 7000 (Masters Research); ECOL 7300 (Thesis Research); ECOL 9000 (Doctoral Research); ECOL 9300 (Doctoral Dissertation); EETH 8010 (Environmental Ethics Graduate research).

**2003-2008:** University of Georgia- ECOL 4950 (Senior Seminar); ECOL 4960H (Honors Research); ECOL 8000 (Topics in Modern Ecology); ECOL 8220 (Stream Ecology); ECOL 8230 (Lake Ecology); ECOL 7000 (Masters Research); ECOL 7300 (Thesis Research); ECOL 9000 (Doctoral Research); ECOL 9300 (Doctoral Dissertation); EETH 8010 (Environmental Ethics Graduate research); Coimbra University, Portugal, Advanced Stream Ecology.

**1992-2003:** Colorado State University- FW 192 (Wildlife Inquires); FW 420 (Water Quality); FW 492 (Senior Seminar); FW 561 (Advanced Topics- Landscape Ecology); NR 320 (Natural Resources Policy and Administration); BY320 (Quantitative Ecology); BZ 474 (Limnology, Limnology Lab); EY 592 (Tropical Ecology Seminar); FW 692 (Graduate Seminar)

**1976-1992:** University of Oklahoma- ZOOL 3403 (Principles of Ecology, Lab); ZOOL 4983 (Senior Seminar); ZOOL 4462 (Limnology, Limnology Lab); ZOOL 5970 (Advanced Stream Biology Seminar); ZOOL 6970 (Climate Change)

**1971-1976:** Washington University- BIO 101 (Introduction to Biology); BIO 305 (Introduction to Ecology); BIO 460 (Limnology, Limnology Lab)

**1968-1970:** Yale University- BIOL. 3000 (Introduction to Ecology).

**1977-2000: Summer Field Stations:** Limnology courses at Douglas Lake Field Station, University of Michigan; Lake Itasca Field Station, University of Minnesota Flathead Lake Field Station, University of Montana, Lake Texoma Biological Station, University of Oklahoma.

### **REVIEWS FOR TENURE AND PROMOTION**

Auburn University, Baylor University, Columbia University, Cornell University, Dartmouth College, Florida Atlantic University, Idaho State University, Michigan State University, Monash University, Ohio State University, Oregon State University, Peking University, University of Alabama, University of Arkansas, University of Minnesota, University of California- Berkeley, University of

California-Riverside, University of Virginia, University of Waterloo, Texas State University, Yale University.

### **AGENCY CAREER REVIEWS FOR PROMOTION**

National Biological Survey, U.S. Geological Survey; US Environmental Protection Agency, USDA Forest Service.

### **PROGRAM REVIEWS**

Auburn University, Iowa State University, Universidad Autonoma de Barcelona, Montana State University, North Carolina State University, Texas State University, University of Alaska, University of Idaho, University of Minnesota-Duluth, University of Montana, University of New Hampshire, University of Puerto Rico, University of Vermont, Virginia Tech University.

### **RECENT EXTERNAL GRANT SUPPORT**

NSF Long Term Ecological Research- DEB-1546686. Luquillo Experimental Forest, Puerto- Subcontract with the University of Puerto Rico- UPR/NSFW/551-574 continuation (2016-2019). This is a 3 yr renewal of research on stream food webs continuously funded since 1988. The new subcontract includes funding for a drought impacts study by Covich, Pringle, Mote, and Ballantyne. Total award to UPR: \$1,501,888 for 2016, \$1,269,258 for 2017, and \$1,148,855 for 2018.

NSF Ecosystem Studies-DEB-1354357: Long Term Studies of Climate Impacts: Sustaining Biodiversity and Ecosystem Services in Tropical Stream Ecosystems, Puerto Rico. This is a 24-month award for a total of \$126,808 (2014-2017) focused on effects of drought on freshwater shrimp predator-prey interactions and food-web analysis related to ecosystem services. An underwater video is in production and a synthesis of long-term data is underway.

NSF Ecosystem Studies-DEB-1404160: Dissertation Improvement Grant- Effects of multiple invasive species on nutrient cycling in Lake Seminole: effects of warmer winters on ecosystem dynamics. This is a 24-month award to complete Stephen D. Shivers' research for a total of \$16,330 (2014 - 2016).

NSF Long Term Ecological Research- Luquillo Experimental Forest, Puerto- Subcontract with the University of Puerto Rico- UPR/NSFW/551-574 continuation. (2012 - 2016). This funding is for a series of studies of the effects of disturbances on stream food webs for a total of \$86,000 per year shared with Catherine Pringle.

NSF Integrating Biodiversity and Biogeochemical Dynamics from a Hydrodynamics Perspective: Long-Term Ecological Research in the Luquillo Mountains. CoPI. 2013-2015 with Mike Willig, University of Connecticut.

U.S. Army Corps of Engineers- Use of eDNA to estimate dispersal of invasive apple snails (*Pomacea*). (2014 -2015). This is an exploratory grant with John Drake and two graduate students, Nick Marzolf, Reni Kaul.

NSF Ecology- Conservation and natural resource management in an uncertain future: Using the Southeastern U.S. as a model for managing change. \$49,000 (2012 - 2015).

U.S.D.A. Forest Service- Conservation and natural resource management in an uncertain future: Using the Southeastern U.S. as a model for managing change. \$15,000 (2012 - 2015).

U.S. Fish and Wildlife Service, Economics Division, Cooperative Agreement Valuing Ecosystem Goods and Service Provided by National Wildlife Refuges. \$110,000 (2009-2012).

NSF BioComplexity: Modeling complex interactions of overlapping river and road networks in a changing landscape. (2003-2009).

U.S. Geological Survey, Biotic Resources Division, U.S. Fish and Wildlife Service. Distribution of Species of Concern- *Macrobachium carcinus*. (2005-2009).

U.S.National Park Service. Coordinating Research Reviews (2006-2008).

### **RECENT PROFESSIONAL SERVICE**

International Association for Ecology, INTECOL Board of Directors, 2003-2018.  
Co-Chair, International Steering Committee, INTECOL Congress, Beijing, China, 2014-2017.

Executive Committee, Tyler Prize for Environmental Achievement, 2012-2018.

Faculty of 1000, Co-Chair of Aquatic Ecology Reviews. 2011-2018.

Ecological Society of America, Historic Records Committee, Chair, Archives Subcommittee, 2010- 2018.

International Scientific Program Planning Committee, Eco-Summit, Montpellier, France, 2014-2016.

National Science Foundation, Dissertation Improvement Grant Review Panel, 2016.

National Science Foundation, EPSCoR Review Panel, 2016.

North Carolina State University Graduate School Program Review, 2016

NSF Review Panel, National Ecological Observatory Network (NEON), 2012

International Society for Limnology, U.S. National representative, 2007-2016

Executive Committee, Tyler Prize for Environmental Achievement, 2012-2017.

Faculty of 1000, Co-Chair of Aquatic Ecology Reviews. 2011-2016.

National Ecological Observatory Network (NEON), External Review Committee, 2014-2015.

National Academy of Sciences of Nicaragua, Canal Expert Review Panel, 2015.

Nicaragua Canal Review Panel, Chair, Florida International University, 2015.

Interdisciplinary Institute, University in Barcelona, Spain. Program Review. 2015,  
 International Association for Ecology, INTECOL President, 2009- 2013.  
 NSF National Advisory Board, Long-Term Ecological Research Program, 2010-  
 2012.  
 ESA Public Policy Rapid Response Team. 2010-2015  
 Citizen Science Advisory Committee, Para la Naturaleza, Fideicomiso de  
 Conservacion de Puerto Rico. 2012-2015.  
 Science Advisory Committee, Puerto Rican Land Trust. Fideicomiso de  
 Conservacion. 2010-2015  
 Southeastern Academy of Natural Sciences Advisory Board. 2012-2015.  
 Invited Speaker, International SedNet Conference, Venice, Italy, 2011  
 Invited Speaker, Long Term Research Conference (LTER), University of San  
 Carlos, Brazil, 2011  
 NSF LTER National Advisory Board, Acting Chair, 2011  
 Science Advisory Committee, Annual Meeting, San Juan, Puerto Rico, American  
 Society of Limnology and Oceanography, 2010-2011.  
 National Science Foundation Panel- Coupled Natural-Human Systems, 2010.  
 Ecological Society of America, Centennial Committee, Chair, 2010-2013.  
 US-Israel Bi-National Science Foundation Board, 2008- 2014.  
 Eco-Summit International Science Committee, 2010-2012, 2013-2014.  
 Advisory Committee, H.J. Andrews Experimental Forest Long Term Ecological  
 Research program, 2000-2012.  
 Science Advisory Board, Conservation Trust of Puerto Rico, 2005- 2014.  
 Program Review Team, Auburn University Biology Department, 2010.  
 National Science Foundation Committee of Visitors, Division of Environmental  
 Biology, Chair, 2009.  
 Blue Ribbon Review Committee for National Ecological Observatory Network  
 (NEON) for National Science Foundation, Chair, 2009.  
 American Association for the Advancement of Science Advisory Board, Vision  
 and Change in Science Education, 2009.  
 United Arab Emirates Freshwater Science Review Committee, 2008-2009  
 Program Review, Department of Ecology, Montana State University, Bozeman.  
 2009.  
 President Elect, President, and Past Present, Ecological Society of America,  
 2006-2008.  
 Coordinator, Southeastern Knowledge Partnership, Ecological Society of  
 America, 2005-2008.  
 Resources for the Future- Steering Committee, Climate Change, 2008-2009.  
 External Advisory Board, University of Florida, College of Natural Resources,  
 2005-2010.

### **UNIVERSITY SERVICE (Since 2010)**

University Tenure and Promotion Appeals Committee (2010-2016)  
 University Council Executive Committee (2010-2016)  
 Search Committee, Georgia Sea Grant Associate Director (2014-2015)

Georgia Museum of Natural History Friends Executive Committee (2012-2016)  
Environmental Ethics Program Executive Committee (2012-2016)  
University of Georgia Press Faculty Editorial Committee (2013-2015)  
Program Review, Marine Sciences and UGA Marine Institute (2012-2013)  
Search Committee, Savannah River Ecology Lab Director (2010-2011)

### **ODUM SCHOOL OF ECOLOGY SERVICE (Since 2010)**

Tenure and Promotion and Awards Committee (2012-2017)  
Seminar Committee (2013-2017)  
Institute of Ecology/Odum School of Ecology 50/10 Committee (2017)  
Search Committee, River Basin Co-Director (2012-2013)  
Search Committee, Savannah River Ecology Laboratory (2012)

### **PRESENTATIONS (SINCE 2000)**

Covich, A.P., T.A. Crowl, and O. Perez. 2017. Distributions of predatory freshwater shrimp (*Macrobrachium*) and their prey (*Atya*, *Xiphocaris*) along an elevational gradient in the Luquillo Mountains, Puerto Rico: Effects of low stream flows on predator upstream movement. 16<sup>th</sup> Congress of Brazilian Limnology, Rio de Janeiro (Invited Keynote).

Covich, A.P., T.A. Crowl, and O. Perez. 2017. Drought effects on tropical headwater streams and sustainability of ecosystem services. International Society for Ecology (INTECOL) Ecological Congress, Beijing, China (Invited).

Covich, A.P., T.A. Crowl, and O. Perez. 2017. Life history and movement of tropical freshwater shrimps during wet and dry years. Gordon Research Conference, Ventura, CA.

Covich, A.P., T.A. Crowl, and O. Perez. 2017. Omnivores are more mobile than detritivores: Tropical shrimps respond to severe drought. Annual Meeting, Ecological Society of America, Portland, OR.

Covich, A.P., T.A. Crowl, and O. Perez. 2017. Life histories alter decapod distributions and foodweb structural changes along environmental gradients in the Luquillo Mountains, Puerto Rico. Annual Meeting, Society for Freshwater Science, Raleigh, NC.

Covich, A. 2017. The effects of intense drought on stream food webs. Save-Our-Streams. Gwinnett, GA. 2017.

Marzolf, N., S. Shivers, C. Smith, S.W Golladay, and A.P. Covich. 2017. An overview of *Pomacea* research in Lake Seminole, Georgia. 109th Annual Meeting, National Shellfisheries Association, Knoxville, TN.

Shivers, S.D., A.P. Covich, S.W. Golladay, M.N. Waters, and S.B. Wilde. 2017. Rivers to reservoirs: Hydrological drivers control reservoir function by affecting submerged aquatic vegetation. Georgia Water Resources Conference, University of Georgia, Athens, GA.

Covich, A.P., T.A. Crowl, and O. Perez. 2016. Predator-prey distributions in tropical streams, Luquillo Mountains, Puerto Rico: Movements of freshwater shrimp (*Macrobrachium carcinus*, *Macrobrachium crenulatum*) following two historic droughts. Ecological Society of America Annual Meeting. Fort Lauderdale, FL.

Perez, O., T.A. Crowl, A.P. Covich, W.M. McDowell, and A. Ramirez. 2016. Droughts and macroinvertebrate community responses in tropical streams in Puerto Rico. Ecological Society of America Annual Meeting. Fort Lauderdale, FL.

Marzolf, N. S.W. Golladay, A.P. Covich, S.B. Wilde, and P. V. McCormick. 2016. Lack of significant physicochemical limitation of invasive Apple Snails further develops the novel ecosystem concept in a large reservoir. Ecological Society of America Annual Meeting. Fort Lauderdale, FL.

Covich, A.P., T.A. Crowl, and O. Perez. 2016. Effects of prolonged drought on rainforest stream in the Luquillo Mountains, Puerto Rico. Island Biology International Conference. Azores, Portugal.

Covich, A.P., T.A. Crowl, and O. Perez. 2016. Network analysis of tropical drainage basins: Habitat connectivity among migrating species. Island Biology International Conference. Azores, Portugal.

Covich, A.P., T.A. Crowl, and O. Perez. 2016. Effects of drought on non-seasonal rainforest streams. Society for Freshwater Science Annual Meeting. Sacramento, CA.

Covich, A.P. T.A. Crowl, and O. Perez. 2016. Predator-prey distributions in tropical streams, Luquillo Mountains, Puerto Rico. Gordon Research Conference on Predation. Ventura, CA.

Marzolf, N. S., Golladay, S. W., Covich, A. P., Wilde, S. B., and McCormick, P. V. 2016. Rapid expansion of an invasive snail and implication for water quality in a novel ecosystem. University of Georgia Celebration of Graduate Education in Support of the Land-Grant Mission. March. Tifton, GA.

Owen, H., A.P. Covich, N. Marzolf, and S. Golladay. 2015. Do non-native apple snails feed preferentially on non-native aquatic plants and potentially alter the food web in Lake Seminole, GA? Odum School of Ecology Graduate Student Symposium. Athens, GA.

Covich, A.P. 2015. Effects of highly variable flows on tropical rainforest headwater food webs. Invited Speaker, Ecology, Evolution Conservation Biology Program Seminar, University of Nevada, Reno, NV.

Marzolf, N., R. Kaul, H. Owen, A.P. Covich, J.M. Drake, and S.W. Golladay. 2015. Development and use of eDNA methods to monitor dispersal of invasive apple snails, *Pomacea maculata* in a SE reservoir. Southern Division American Fisheries Society Annual Meeting. Savannah, GA.

Marzolf, N., A.P. Covich, S.W. Golladay, P.V. McCormick, and S.B. Wilde. 2015. Faster than a swimming snail: Understanding ecological impacts of apple snails in Lake Seminole. Odum School of Ecology Graduate Student Symposium. Athens, GA.

Marzolf, N., S.D. Shivers, B.C. Clayton, S.W. Golladay, A.P. Covich, and P.V. McCormick. 2015. Is environmental calcium availability limiting dispersal of an invasive snail in Lake Seminole and associated smaller lakes? Georgia Water Resources Conference, University of Georgia, Athens, GA.

Covich, A.P. 2015. Long-term effects of multiple hurricanes and droughts on stream detritivores and ecosystem services in Puerto Rican streams. Association for Tropical Biology and Conservation Annual Meeting, Honolulu, HI.

Covich, A.P. 2015. Frank Golley's international perspective on the need for environmental ethics in tropical rainforest ecosystem research. Annual Meeting, Ecological Society of America, Baltimore, MD.

Crowl, T.A., O. Perez-Reyes, H. Briceno, and A.P. Covich. 2015. Community organization and ecosystem response to anthropogenic impacts: Are subtropical, coastal rivers different? Annual Meeting, Ecological Society of America, Baltimore, MD.

Perez-Reyes, O., T.A. Crowl, and A.P. Covich. 2015. Decapod communities under effects of hurricanes, droughts, and humans in Neotropical streams. Annual Meeting, Ecological Society of America, Baltimore, MD.

Shivers, S., N. Marzolf, A. Covich, and S. Golladay. 2015. Will novel combinations of invasive species alter nutrient retention in a subtropical reservoir? Annual Meeting, Ecological Society of America, Baltimore, MD.

Barnard, M.A., A.P. Covich, J.W. Porter, and S.B. Wilde. 2015. Providing potable water from algal filtration: The frontiers of sustainability in your backyard. Annual Meeting, Ecological Society of America, Baltimore, MD.



Covich, A.P., T.A. Crowl, and Omar Perez-Reyes. 2015. Effects of disturbance on upstream and downstream movements: When and where are droughts likely to have the most impact on Neotropical headwater streams? Annual Meeting, Society for Freshwater Science, Milwaukee, WI.

Diaz, D., P. McCormick, and A. Covich. 2015. Influence of growing season stream flows on periphyton growth. Annual Meeting, Society for Freshwater Science, Milwaukee, WI.

Marzolf, N., N. Smith, S. Shivers, S. Golladay, and A. Covich. 2015. Abiotic effects on spatial distribution and abundance of two highly invasive species in a novel lake ecosystem. Annual Meeting, Society for Freshwater Science, Milwaukee, WI.

Smith, C., P. McCormick, S. Golladay, and A. Covich. 2015. Recovery of aquatic macroinvertebrate assemblages following stream drying in Southwest Georgia, USA. Annual Meeting, Society for Freshwater Science, Milwaukee, WI.

Covich, A.P., T.A. Crowl, O. Perez-Reyes. 2014. Predator prey interactions among freshwater decapods in headwater streams of the Luquillo Mountain, Puerto Rico. Gordon Research Conference on Predation, Ventura, CA.

Marzolf, N., S. Golladay, and A. Covich. 2014. Quantifying effects of invasive apple snails (*Pomacea maculata*) in a large reservoir: an outline for research. Florida Lake Management Society's 25th Annual Technical Symposium. Stuart, FL

Marzolf, N., A.P. Covich, and S.W. Golladay. 2014. Determining trophic impacts and modeling spread of invasive island apple snails (*Pomacea maculata*) in Lake Seminole. Odum School of Ecology Graduate Student Symposium. Athens, GA.

Diaz, D.L., A. P. Covich, and P.V. McCormick. 2014. Periphyton response to stream flow regime changes and cascading effects of aquatic grazers. Odum School of Ecology Graduate Student Symposium. Athens, GA.

Covich, A.P., T.A. Crowl, O. Perez-Reyes, and C.L. Hein. 2014. Predator-prey interactions and spatial refugia in tropical streams, Luquillo Mountains, Puerto Rico. Gordon Research Conference on Predator-Prey Interactions. Ventura, CA.

Perez-Reyes, O., T.A. Crowl and A.P. Covich. 2014. Climate change impacts on Caribbean tropical streams: Implications for the amphidromous life cycle. Freshwater Science Symposium, Portland, OR.

Covich, A.P., T.A. Crowl, O. Perez-Reyes, and C.L. Hein. 2014. Effects of hydrologic variability and dispersal on predator-prey interactions in tropical streams, Luquillo, Puerto Rico. Freshwater Science Symposium, Portland, OR.

Waters, M., S.W. Golladay, A.P. Covich, S.D. Schivers, J.M. Smoak, J.E. Boston, and C.H. Patrick. 2014. Landuse, fragmentation, and biological invasions influence benthic and pelagic biogeochemical processes in a large, shallow reservoir, Lake Seminole, Georgia. Freshwater Science Symposium, Portland, OR.

Smith, C.R., P.V. McCormick, S. W. Golladay, and A.P. Covich. 2014. Influence of stream intermittency on aquatic invertebrate assemblages in the Lower Flint River Basin, southwestern Georgia. Freshwater Science Symposium, Portland, OR.

Shivers, S.D., S.W. Golladay, and A.P. Covich. 2014. Effects of multiple invasive species on nutrient cycling within a shallow subtropical reservoir, Lake Seminole, GA. Odum School Graduate Student Symposium. Athens, GA.

Shivers, S.D., S.W. Golladay, and A.P. Covich. 2014. Effects of invasive species on nutrient cycling within a shallow subtropical reservoir, Lake Seminole, GA. University of Georgia Graduate Education Advancement Board Meeting. Albany, GA.

Shivers, S.D., B.C. Clayton, J. Brock, A.P. Covich, and S.W. Golladay. 2014. Will invasive species additions alter ecological function in a novel ecosystem, Lake Seminole, GA? Jones Center Scientific Advisory Committee Meeting. Newton, GA.

Covich, A.P. 2013. The need for long term studies for evaluating ecosystem services- a Puerto Rican Case Study. University of Kansas Biological Survey. Distinguished Speaker, Lawrence, KS.

Covich, A.P. 2013. The importance of long-term research in evaluating ecosystem services- a Puerto Rican Case study. International Long Term Ecological Research conference, Seoul, Korea.

Covich, A.P. 2013. The value of biodiversity in sustaining freshwater ecosystem services- a Puerto Rican case study. Department of Biology, University of Oklahoma, Norman, OK.

Covich, A.P., D. Patton, J.C. Bergstrom, and R.L. Moore. 2013. Evaluating wetland ecosystem services sustained by high biodiversity in the Okefenokee National Wildlife Refuge, Georgia, USA, under climate-driven drought. International Ecology Congress, INTECOL 2013, London, UK.

Perez-Reyes, O., T.A. Crowl, and A.P. Covich. 2013. Trophic relationships in natural and urban Neotropical streams in Puerto Rico. Annual Meeting of the Society for Freshwater Science, Jacksonville, FL.

Torres, P.J., O. Perez-Reyes, E.A. Greathouse, K.L. Smith, A.P. Covich, T.A. Crowl and C.M. Pringle. 2013. Long-term (>10 years) variation in benthic algal resources in two tropical streams with contrasting macroconsumer assemblages. Annual Meeting of the Society for Freshwater Science, Jacksonville, FL.

Crowl, T.A., O. Perez, and A.P. Covich. 2013. Understanding the complexity of physical, ecological and human interactions on tropical island water and ecosystem sustainability. Annual Meeting, Association for Tropical Biology and Conservation, San Jose, Costa Rica.

Teasley, E., A.P. Covich, and S. Golladay. 2013. Drought in southwest Georgia: Impacts on mosquito populations in reference and agricultural wetlands. Annual Meeting of the Society for Freshwater Science, Jacksonville, FL.

Covich, A.P. 2013. The value of biodiversity in sustaining freshwater ecosystem services- a Puerto Rican case study. Biology Department, Ball State University, Muncie, IN.

Covich, A.P. 2012. Effects of disturbance on biodiversity and ecosystem services in tropical montane stream communities of Puerto Rico. Appalachian State University, North Carolina.

Covich, A. P. and T.A. Crowl. 2012. The roles of dominant decapods in tropical headwater streams that sustain freshwater ecosystem services in the Luquillo Mountains, Puerto Rico. Annual Meeting, Association for Limnology and Oceanography, Lake Biwa, Otsu, Japan.

Covich, A.P. 2012. On the role of omnivorous freshwater crabs in Neotropical streams, Puerto Rico. Annual Meeting of the Association of Freshwater Sciences, Louisville, Kentucky.

Perez-Reyes, O., Crowl, T.A., and A.P. Covich. 2012. Experimental and observational data on migration patterns, density and growth rates of *Atya lanipes* and *Xiphocaris elongata* in tropical streams in the Luquillo mountains, Puerto Rico. Congreso de Macroinvertebrados Acuaticos, San Jose, Costa Rica.

Covich, A.P. 2012. Impacts of drought on freshwater biodiversity in the Southeast. Annual Meeting, Association of Southeastern Biologists. Athens, GA.

Botello, G.M., S.W. Golladay, A.P. Covich. 2012. Larval mosquito assemblages in agricultural wetlands of southwestern Georgia: Investigating the Influence of Surrounding Land Use. Poster Presentation. Ecological Society of America. Portland, OR.

Botello, G.M., S.W. Golladay, A.P. Covich. 2012. Larval mosquito assemblages in agricultural wetlands of southwestern Georgia: The influence of surrounding land use. Annual Meeting, Association of Southeastern Biologists. Athens, GA.

Botello, G.M., S.W. Golladay, A.P. Covich. 2012. Investigating the effects of agricultural land use on larval mosquito assemblages in isolated wetlands of southwestern Georgia. Odum School of Ecology Graduate Student Symposium. Athens, GA.

McKay, S.K., A.P. Covich, M.C. Freeman, C.R. Jackson, and J.R. Schramski. 2012. Identifying thresholds in ecological response to river discharge using effectiveness analysis. Odum School of Ecology Graduate Student Symposium. Athens, GA.

Teasley, E.R., A.P. Covich, S.W. Golladay, D.G. Mead, and M.S. Blackmore. 2012. Incidence of West Nile virus in mosquitoes and turtles in reference and agricultural wetlands in southwestern Georgia. Odum School of Ecology Graduate Student Symposium. Athens, GA.

King, R.L. King, L.L. Smith, A.P. Covich, J.C. Maerz, and S.W. Golladay. 2012. Odum School of Ecology Graduate Student Symposium. Athens, GA.

Botello, G.M., S.W. Golladay, A.P. Covich. 2012. Larval mosquitoes in agricultural wetlands of southwestern Georgia: Investigating the effects of land use. J.W. Jones Ecological Research Center Annual Meeting. Newton GA.

Covich, A.P. 2011. Invited keynote- Fresh water sediments and biodiversity. 7th International SedNet Conference on Sediments and Biodiversity: Bridging the gap between science and policy. Venice, Italy.

Covich, A.P. 2011. Invited keynote- The roles of ecological societies to our science- Long term studies of tropical freshwater ecology. First Brazilian International Ecology Symposium, Universidade Federal de São Carlos, Brazil.

Covich, A. P., T.A. Crowl. 2011. The roles of dominant decapods in tropical headwater streams that sustain freshwater ecosystem services in the Luquillo Mountains, Puerto Rico. Association for Limnology and Oceanography, Annual Meeting, San Juan, PR.

Crowl, T.A. and A.P. Covich. 2011. Importance of scale in tropical headwater stream food webs: Trophic diversity and detrital processing by decapod crustaceans. North American Benthological Society Annual Meeting, Providence, RI.

Covich, A.P., J.C. Bergstrom, R.L. Moore, and D.A. Patton. 2011. Effects of drought on freshwater ecosystem services and biodiversity: Examples from the

Savannah River Basin. Ecological Society of America 96TH Annual Meeting, Austin, TX.

Shivers, S.D., S.P. Opsahl and AP Covich, 2011. University of Georgia, Joseph W. Jones Ecological Research Center. The diel and seasonal effects of submerged aquatic vegetation on nutrient dynamics and organic carbon bioavailability in a southeastern reservoir. Ecological Society of America 96TH Annual Meeting, Austin, TX.

Botello, G.M., S.W. Golladay, A.P. Covich. 2011. Larval mosquitoes in agricultural wetlands: Investigating the effects of land use and nutrient enrichment. Georgia Department of Natural Resources: Commissioner's Southwestern Annual Meeting. Newton, GA.

Botello, G.M., S.W. Golladay, A.P. Covich. 2011. Larval mosquito distribution and development in isolated wetlands of southwestern Georgia. Odum School of Ecology Graduate Student Symposium. Athens, GA.

Jones, J.A., K. Hatcher, A.P. Covich, C. Dahm, N.B. Grimm, and M. Williams. 2011. Water supply sensitivity and ecosystem resilience to land use change, climate change, and climate variability. Ecological Society of America 96TH Annual Meeting, Austin, TX.

Covich, A.P. 2010. Long-term changes in precipitation and stream flow in the Luquillo Mountains, Puerto Rico. Effects of climate change on stream flows. Long-Term Ecological Research Workshop, University of New Mexico, Sevilleta, NM.

Covich, A.P. 2010. Biodiversity and resilience of ecosystem services in a rapidly changing world. Invited Plenary Presentation, British Ecological Society Annual Meeting, Leeds, UK.

Covich, A.P. 2010. The value of the Long-Term Ecological Research Program in understanding global issues related to freshwater ecosystem services. Fourth East Asian Federation of Ecological Societies International Congress, Sanju, Korea.

Covich, A.P. 2010. On Biodiversity of Tropical Island Streams. Invited Lecture, Museum of Natural History, University of Coimbra, Coimbra, Portugal.

Covich, A.P. 2010. How Different Are Tropical Insular Streams from Continental Streams? Invited Plenary Lecture, 15th Annual Congress, Iberian Limnology Association Congress, Azores, Portugal.

Covich, A.P. 2010. The role of ecological societies in conveying vulnerability associated with climate change. Ecological Society of America, Annual Meeting, Pittsburgh, PA.

Covich, A.P., J.C. Bergstrom, R.L. Moore, D. Patton, S. Aircher. 2010. Climate-driven thresholds and cumulative effects of droughts and floods on inland aquatic ecosystems. Ecological Society of America, Annual Meeting, Pittsburgh, PA.

Covich, A.P. and T.A. Crowl. 2010. Network approaches to understanding complex aquatic ecosystem dynamics. Invited Interactive Session, Joint Annual Meeting of the American Society of Limnology and Oceanography and the North American Benthological Society, Santa Fe, NM.

Crowl, T.A. and A.P. Covich. 2010. Analysis of shrimp upstream migration using agent-based modeling. Joint Annual Meeting of the American Society of Limnology and Oceanography and the North American Benthological Society, Santa Fe, NM.

Opsahl, S.P., J.M. McEntire, and A.P. Covich. 2010. Internal cycling of nutrients and dissolved organic carbon in a subtropical reservoir: Implications for watershed delivery to the northern Gulf of Mexico. Joint Annual Meeting of the American Society of Limnology and Oceanography and the North American Benthological Society, Santa Fe, NM.

Shivers, S.D, S.P. Opsahl, and A.P. Covich. 2010. The impact of submerged aquatic vegetation on dissolved organic carbon production and bacterial metabolism. Joint Annual Meeting of the American Society of Limnology and Oceanography and the North American Benthological Society, Santa Fe, NM.

Covich, A.P. 2010. The value of long-term, place-based research on stream biodiversity. Invited Plenary Presentation, Dyson Research Center, Washington University, St. Louis, MO.

McEntire, J., S. Opshal and A. Covich. 2010. Nutrient and organic carbon sources and sinks in Lake Seminole: Implications for water quality in the ACF system. Sustainable Water Resources Conference, Gainesville, FL.

Bergstrom, J.C., A. P. Covich, R.L. Moore, J. Caudill, and P. Grigelis. 2010. A conceptual framework and plan for valuing ecosystem goods and services provided by U.S. National Wildlife Refuges. Conference on Benefits and Costs of Public Policies Affecting Public and Private Lands (U.S.D.A. W-2133 Regional Research Project Annual Meetings). Tucson, AZ.

Covich, A.P. 2009. Effects of extreme droughts on biodiversity and freshwater ecosystem services. Invited Jenner Lecture, Curriculum for the Environment and Ecology, University of North Carolina at Chapel Hill, NC.

Covich, A.P. 2009. Climate change impacts on river networks. Invited Minshall Lecture, Idaho State University, Pocatello, ID.

Covich, A., A. Ignatius, K. McKay, J. McEntire, S. Opshal, S. Golladay. 2009. Extreme droughts in the southeast- How do we sustain ecosystem services.? Case Study Video Presentation, Ecological Society of America, Drought Conference, University of Georgia, Athens, GA.

McKay, K., B. Pruitt and A. Covich. 2009. Monitoring ecosystem integrity. Georgia Water Resources Conference, Athens, GA.

Covich, A.P. 2008. Adaptations to climate change and impacts on freshwater biodiversity and ecosystem services. Resources for the Future, Washington, DC.

Covich, A.P. 2008. The role of species diversity in sustaining ecosystem services in tropical headwater streams. Invited Lecture, Harvard Forest, Petersham, MA.

Covich, A.P. 2008. Cumulative effects of drought and hurricane-derived floods on freshwater ecosystem services in tropical streams. Invited Plenary presentation, 4th Congreso de la Asociacion Mexicana de Limnologia, Veracruz, Mexico.

Covich, A.P. 2008. Effects of drought on temperate and tropical streams- impacts on ecosystem services. Natural Sciences Graduate Program, Clayton State University, GA.

Covich, A.P. 2008. Freshwater ecosystem services in tropical streams: The role of biodiversity. University of Montana, Missoula, MT.

Atkinson, C.L., S. Opsahl, A.P. Covich, S.W. Golladay. 2008. Environmental flows: Variations in discharge fuels stream productivity. Southeastern Environmental Flows Partnership Conference, Classic Center, Athens, GA.

Sargent, L.W., S.W. Golladay, A.P. Covich, S.P. Opshal, and A.D. Rosemond. 2008. Predicting invasion success of a lotic crayfish from physiochemical habitat variable and predator- avoidance behavior. North American Benthological Society of America Annual Meeting, Salt Lake City, UT.

Atkinson, C.L., S.P. Opsahl, A.P. Covich and S.W. Golladay. 2008. Differences in feeding ecology and ecological services provided by native mussels versus an invasive bivalve, *Corbicula fluminea*. North American Benthological Society of America Annual Meeting, Salt Lake City, UT.

Covich, A.P. 2008. Freshwater ecosystem services in tropical streams: The role of biodiversity. University of Montana, Missoula, MT.

Atkinson, C.L., S.P. Opsahl, A.P. Covich, S.W. Golladay. 2008. Environmental flows: Variations in discharge fuels stream productivity. Southeastern Environmental Flows Partnership Conference, Classic Center, Athens, GA.

Sargent, L.W., S.W. Golladay, A.P. Covich, S.P. Opsahl and A.D. Rosemond. 2008. Predicting invasion success of a lotic crayfish from physiochemical habitat variable and predator-avoidance behavior. North American Benthological Society of America Annual Meeting, Salt Lake City, UT.

Atkinson, C.L., S.P. Opsahl, A.P. Covich and S.W. Golladay. 2008. Differences in feeding ecology and ecological services provided by native mussels versus an invasive bivalve, *Corbicula fluminea*. North American Benthological Society of America Annual Meeting, Salt Lake City, UT.

Covich, A.P., T.A. Crowl, D.J. Lodge, T. Heartsill-Scalley, F.N. Scatena, W.H. McDowell, G. Gonzalez. 2008. Non-seasonal intermittent rainforest streams: Caribbean perspectives on pulsed rainfall and litter transport dynamics. North American Benthological Society of America Annual Meeting, Salt Lake City, UT.

Whitehead, E., M. Blackmore, S. Golladay, A. Covich and D. Mead. 2008. Adult mosquito community composition and arborvirus prevalence in a southwest Georgia ecological preserve. 31<sup>st</sup> Annual Meeting, Georgia Mosquito Control Association, University of Georgia, Athens, GA.

Covich, A.P. 2008. Connecting stakeholder views on ecosystem services in the Southeast. Southeastern Association of Biologists Annual Meeting, Symposium on the Southeastern Knowledge Partnership, Greenville, South Carolina, SC.

McEntire, J., S.P. Opsahl, A.P. Covich, P. Inglett. 2008. The role of submerged vegetation (*Hydrilla*) on nutrient budgets of Lake Seminole. Lake Seminole Workshop, Joseph W. Jones Ecological Research Center, Ichauway, GA.

Covich, A.P. 2007. Importance of ontogenetic shifts in stream food webs: Tropical streams and long-lived consumers. Department of Biology, Indiana University, Bloomington, IN.

Covich, A.P. and T.A. Crowl. 2007. Upstream migrations of freshwater shrimp. Society for Crustacean Biology, invited plenary lecture, La Serena, Chile.

Crowl, T.A., Covich, A.P., C. Hein, M.S. Reed and T. Heartsill-Scalley. 2007. The role of road corridors on riparian vegetation and tropical streams. Ecological Society of America Annual Meeting, San Jose, CA. 2007.

Covich, A.P. 2007. The role of ecological research in the age of globalization. Presidential Address, Ecological Society of American Annual Meeting, San Jose, CA.



Covich, A.P. and T.A. Crowl. 2007. Predator-prey dynamics of tropical freshwater shrimp: Responses to disturbance. North American Benthological Society Annual Meeting, Columbia, SC.

Atkinson, C.L., S.P. Opshal, S.W. Golladay, and A.P. Covich. 2007. Flow Regime Effects on Basal Food Resources in a Coastal Plain Stream. North American Benthological Society Annual Meeting, Columbia, SC.

Hein, C.L., T.A. Crowl, A. Gonzalez-Caban and A.P. Covich. 2007. Conservation of a predatory, freshwater shrimp (*Macrobrachium carcinus*) in Puerto Rico. North American Benthological Society Annual Meeting, Columbia, SC.

Crowl, T.A., A.P. Covich, C. L. Hein, and T. Heartsill Scalley. 2007. The role of road corridors on riparian vegetation and tropical stream ecosystem dynamics. North American Benthological Society Annual Meeting, Columbia, SC.

Covich, A.P. 2007. Biodiversity and ecosystem processing in stream ecosystems. Joseph W. Jones Ecological Research Center, Ichauway, GA.

Covich, A.P. 2006. Using network analysis to integrate drainage networks, food webs and road networks: Effects of increased road access and harvesting of top consumers by fishermen. Hydrology Days Symposium, Colorado State University, Fort Collins, CO.

Covich, A.P., K.S. Fraiola, W.F. Cross, and T.A. Crowl. 2006. Beyond species richness: Biodiversity and detrital processing by long-lived decapod crustaceans in tropical headwater streams. North American Benthological Society Annual Meeting, Anchorage, AK.

Cross, W.F., A.P. Covich, A. Ramirez, M.A. Chadwick, and T.A. Crowl. 2006. Growth rates, longevity, and production of tropical freshwater shrimps in two headwater streams of Puerto Rico. North American Benthological Society Annual Meeting, Anchorage, AK.

Crowl, T.A., C. Mingione, A.P. Covich, and G.E. Belovsky. 2006. Leaf breakdown in streams: A tropical – temperate comparison. North American Benthological Society Annual Meeting, Anchorage, AK.

Kikkert, D.A., T.A. Crowl and A.P. Covich. 2006. Physical and chemical factors affecting the upstream migration of amphidromous shrimp in the Luquillo Experimental Forest, Puerto Rico. North American Benthological Society Annual Meeting, Anchorage, AK.

Hein, C.L., A.S. Pike, J.F. Blanco, K.R. Sherrill, T.A. Crowl, A.P. Covich, and F.N. Scatena. 2006. Geomorphologic and anthropogenic influences on tropical stream

communities. North American Benthological Society Annual Meeting, Anchorage, AK.

Fraiola, K.S. and A.P. Covich. 2006. Ontogenetic shifts in diets of freshwater crabs. American Society of Limnology and Oceanography, Vancouver, British Columbia.

Covich, A.P. 2006. Effects of benthic biodiversity on stream ecosystem processes. Ecological Society of America meeting on "Effects of Globalization", Merida, Yucatan, Mexico.

Covich, A.P. 2006. Biodiversity and stream ecosystem function: The importance of losing key species. EAWAG, Lucerne, Switzerland.

Covich, A.P. 2006. Importance of invasive species in ecological systems. ESA Press Conference on Biological Invasions: Recommendation for U.S. policy and management, National Press Club, Washington, DC.

Covich, A.P. 2006. The role of biodiversity in ecosystem processes: Tropical streams as test cases. Department of Zoology, North Carolina State University, Raleigh, NC.

Covich, A.P. 2005. Dispersal-limited communities: functional diversity in tropical insular streams. Invited Plenary Lecture, Fourth Symposium for European Freshwater Sciences, Krakow, Poland.

Covich, A.P. 2005. The role of species redundancy in ecosystem processing of organic matter following disturbances. Invited Plenary Lecture, Sixth Venezuelan Ecology Congress, Maracaibo, Venezuela.

Covich, A.P. 2005. The importance of species dispersal in recolonizing streams following disturbances. Invited Lecture, Sixth Venezuelan Ecology Congress, Maracaibo, Venezuela.

Covich, A.P. 2005. The importance of scale in tropical headwater stream food webs: loss of trophic diversity and detrital processing by decapod crustaceans. Symposium on Biodiversity and Aquatic Ecosystem Processing, Ecological Society of America – INTECOL Joint Meeting, Montreal, Canada.

Covich, A.P., 2005. The role of decapods in ecosystem function in Puerto Rican streams. American Society of Limnology and Oceanography Summer Meeting, Santiago de Compostela, Spain.

Covich, A.P. 2005. Understanding ecological responses to hydrologic alteration in streams and rivers. North American Benthological Society and American Geophysical Union Joint Assembly, New Orleans, LA.

Crowl, T.A., T. Heartsill-Scalley, A.P. Covich, C.L. Hein. 2005. The role of road corridors on riparian vegetation and stream ecosystem dynamics. North American Benthological Society and American Geophysical Union Joint Assembly, New Orleans, LA.

Cross, W.F., J.P. Benstead, J.G. March, A. Ramirez, W.H. McDowell, A.P. Covich. 2005. Consumer-driven nutrient recycling and its effects on whole ecosystem flux in tropical streams. North American Benthological Society and American Geophysical Union Joint Assembly, New Orleans, LA.

Covich, A.P. 2005. The importance of biodiversity in sustaining ecosystem services. Instituto Superior de Agronomia, Lisbon, Portugal.

Covich, A.P. 2005. Biodiversity of sediments: Essential ecosystem services for productive freshwaters. Invited symposium, American Association for the Advancement of Science, Washington, D.C.

Covich, A.P. 2005. The importance of tropical stream biodiversity in ecosystem processing, Department of Zoology- Department of Biology- Ecology Center, Southern Illinois University, Carbondale, IL.

Covich, A.P. 2005. Redundancy in species assemblages and ecosystem processing in freshwaters, Department of Biology, Fordham University, NY.

Covich, A.P. 2004. Effects of hurricanes on tropical watersheds: Woody debris inputs. Instituto Superior de Agronomia, Lisbon, Portugal.

Covich, A.P. 2004. The role of biodiversity in stream ecosystems: Processing of organic detrital matter. University of Evora, Evora, Portugal.

Covich, A.P. 2004. Impacts of hurricanes on stream ecosystems. Archbold Biological Station, Lakeland, FL.

Covich, A.P. 2004. The role of biodiversity in ecosystem processing. Woods Hole Biological Institution, Ecosystem Research Center, Woods Hole, MA.

Box, P.W., A.P. Covich, T.A. Crowl, A. Gonzalez-Caban, L.R. Guitierrez, M. Laituri, J.B. Loomis, A. Pike, J.A. Ramirez, L.E. Santiago, F.N. Scatena, C.D. Tomlin, E.E. Wohl. 2004. Modeling complex interactions of overlapping river and road networks in a changing landscape. Hydrology Days, Colorado State University, Fort Collins, CO.

Covich, A.P. 2003. Building a network of networks: The National Environmental Observatory Network (NEON). First Southeastern NEON Workshop:

Visualization and forecasting of environmental changes in the southeastern United States (and beyond). Savannah River Ecology Laboratory, Aiken, SC.

Covich, A.P. 2003. Effects of climate change on streams. Environmental Future of Aquatic Ecosystems Symposium, ETH, Zürich, Switzerland.

Covich, A.P. 2003. Food webs and network analysis in tropical streams. Long Term Ecological Research All Scientists Meeting, Seattle, WA.

Covich, A.P. 2003. Ecological factors determining the distribution of the omnivorous river shrimp, *Macrobrachium carcinus*, in Puerto Rico. North American Benthological Society 51<sup>st</sup> Annual Meeting, Athens, GA.

Covich, A.P. 2003. The importance of omnivory in tropical stream food webs. North American Benthological Society 51<sup>st</sup> Annual Meeting, Athens, GA.

Covich, A.P. 2003. Riparian vegetation changes and detrital stream systems in a tropical montane landscape. North American Benthological Society 51<sup>st</sup> Annual Meeting, Athens, GA.

Wright, M.S. and A.P. Covich. 2003. Microbial and invertebrate processing of leaf litter in Puerto Rican headwater. Biology Department, University of Puerto Rico, Rio Piedras, PR.

Covich, A.P. 2002. The effects of benthic biodiversity on stream ecosystem function. Conference on Aquatic Biodiversity and Ecosystem Function. Ascona, Switzerland.

Covich, A.P. 2002. A network approach to stream food webs. LTER Cross-Site Workshop on Use of Network Analysis in Food Webs. Sevilleta Long Term Ecological Research Station, University of New Mexico, Albuquerque, NM.

Covich, A.P., T.A. Crowl and F.N. Scatena. 2001. Effects of extreme low flows on freshwater shrimps in a perennial tropical stream of the Luquillo Experimental Forest, Puerto Rico. International Limnology Congress, Monash University, Clayton, Victoria, Australia.

Covich, A.P. 2001. How does prolonged drought alter tropical freshwater stream food webs? Symposium on the Role of Drought in Aquatic Ecosystems, Albury, New South Wales, Australia.

Covich, A.P. 2001. Effects of environmental and climatic factors on crayfish distributions. North American Benthological Society Annual Meeting, La Crosse, WI.

Crowl, T.A., M.J. Townsend, A.P. Covich, and F.N. Scatena. 2001. Particulate organic matter dynamics in tropical headwater streams: A comparison of biotic and abiotic factors. North American Benthological Society Annual Meeting, La Crosse, WI.

Covich, A.P. 2001. A network approach to assembly and reassembly of food webs in tropical streams. Stream Ecology Group, Department of Biological Sciences, University of California, Santa Barbara, CA.

Covich, A.P. 2001. A landscape perspective on effects of disturbances on food webs in tropical streams. National Center for Ecological Synthesis and Analysis, University of California, Santa Barbara, CA.

Covich, A.P. 2001. How different are insular tropical streams? Symposium on Insular Tropical Streams, Society for Conservation Biology Annual Meeting, University of Hawaii, Hilo, HI.

Covich, A.P., S.H. Cooney, A. Harig, and K. Fausch. 2001. Climate change and implications for the recovery of greenback cutthroat trout in Colorado. Symposium on Effects of Regional Climate Change on Ecosystems. Ecological Society of America Annual Meeting, Madison, WI.

Crowl, T.A. and A.P. Covich. 2001. Trophic cascades in the detrital food webs of tropical streams: Effects of omnivorous decapods. Ecological Society of America Annual Meeting, Madison, WI.

Covich, A.P. 2001. BioOne: A new partnership of professional societies, libraries, publishers and universities. Symposium on the Future of Scholarly Communication in the Digital Age, Colorado State University, Ft. Collins, CO.

Covich, A.P. 2000. The role of woody debris in temperate and tropical streams: A long-term perspective on riparian disturbance. International Conference on Wood in World Rivers. Oregon State University, Corvallis, OR.

Crowl, T.A., A.P. Covich, and F.N. Scatena. 2000. Physical discontinuity hypothesis: The role of geomorphic barriers on foodweb structure and function in tropical watersheds, Puerto Rico. North American Benthological Society Annual Meeting, Keystone, CO.

Covich, A.P., J.K. Henry, S.L. Johnson, J. Rincon, T.A. Crowl and F.N. Scatena. 2000. Feast or famine? Effects of pulsed riparian litter inputs on tropical stream food webs. North American Benthological Society Annual Meeting, Keystone, CO.

Henry, J.K., A.P. Covich, T.S. Bowden, and T.A. Crowl. 2000. Mayfly predation by juvenile freshwater crabs: Implications for crab habitat selection. North American Benthological Society Annual Meeting, Keystone, CO.

Kinzie, R.A., A.P. Covich, C.T. Chong, and S.T. Larned. 2000. Investigation of detritivore interactions using microcosms. North American Bentological Society Annual Meeting, Keystone, CO.

Covich, A.P., S.J. Cooney, J.S. Baron, N.T. Hobbs, J. Loomis and D. Ojima. 2000. An integrated assessment of the effects of climate change on Rocky Mountain National Park and its gateway community. Estes Park, CO.

## SUPERVISION OF GRADUATE STUDENTS

Nick Marzolf, 2013-2015. Effects of invasive *Pomacea* on *Hydrilla* and nutrient cycling in Lake Seminole, southeastern Georgia.

David Diaz, 2013-15. Environmental flows: Effects of temperature increases on algal and snail distributions in southeastern watershed.

Chelsea Smith, 2012-2015 Macroinvertebrate distributions along a gradient of intermittent and permanent flows in southeastern Georgia.

Stephen Shivers, 2011-2016. Effects of turbidity and nutrient cycling on *Hydrilla* population dynamics in Lake Seminole. Ph.D. Ecology, University of Georgia.

Steven Kyle McKay, 2009-2014. Informing flow management decisions in the Middle Oconee River. Ph.D. Ecology, University of Georgia.

Rachel King, 2011-2013. Connectivity of streams and wetlands as dispersal corridors for turtles in the Flint River Basin.

Erica Teasley, 2011-2013. Effects of drought on wetlands and mosquito transmission of West Nile virus in southeastern Georgia.

Gina Botello-Young, 2010-2012. Wetland ecology and mosquito population dynamics in southeastern Georgia. M.S. University of Georgia (Steve Golladay, co-advisor)

Stephen Shivers, 2008-2010. Effects of variable flows on nutrient dynamics in Lake Seminole. M.S. Ecology, University of Georgia (Steve Opsahl, co-advisor)

Eva Whitehead, 2007-2009. Effects of variable rainfall on mosquito populations. M.S. Ecology, University of Georgia (Steve Golladay, co-advisor)

Julie McIntire, 2007-2009. Nutrient dynamics and carbon cycling in Lake Seminole. M.S. Ecology, University of Georgia. (Steve Opsahl, co-advisor)

Carla Atkinson 2006-2008. The roles of crayfish foraging on ecosystem dynamics of the Flint River. M.S. Ecology, University of Georgia. (Steve Opsahl, co-advisor)

Lindsey Sargent 2006-2008. Impact of non-native crayfish on native crayfish in the Flint River. M.S. Ecology, University of Georgia. (Steve Golladay, co-advisor)

Kauaoa Fraiola 2004-2006. Omnivorous freshwater crabs as regulators of tropical stream food webs. M.S. Ecology, University of Georgia.

Carol Flaute 2004-2007. The role of gastropods in bioaccumulation of heavy metals in food-webs. M.S. Ecology, University of Georgia.

Meredith S. Wright 2002. Microbial and invertebrate processing of leaf litter in a Puerto Rican headwater stream. M.S. Ecology, Colorado State University.

Scott Conney 2001. Global warming: Implications for recovery of the greenback cutthroat trout in Rocky Mountain streams. M.S. Ecology, Colorado State University

Diane Emmons 2001. Environmental education in high school science programs. M.S. Fishery and Wildlife Biology, Colorado State University. (E. Decker, co-advisor)

Julie Henry Zimmerman 2000. Roles of freshwater crabs as predators on mayflies in headwater streams. M.S. Ecology, Colorado State University.

Paul O'Connor 1998. Importance of non-native riparian bamboo for freshwater shrimp detritivores. M.S. Ecology, Colorado State University

Angela Reed 1998. Effects of landuse legacies and hurricanes on riparian palm distributions. M.S. Ecology, Colorado State University.

Sherri L. Johnson 1995. Riparian input and hydrologic transport of organic seston along a prairie river. Ph.D. Zoology, University of Oklahoma.

Sherri L. Johnson 1992. Orientation of underwater structure and light intensity: Variables of cover choice by bluegills. M.S. Zoology, University of Oklahoma

David L. Certain 1991. Effects of age and light regime on feeding rates of white crappie (*Poxomis annularis*). M.S. Zoology, University of Oklahoma.

Todd A. Crowl 1989. Life histories of freshwater gastropods as influenced by crayfish predation. Ph.D. Zoology, University of Oklahoma.

Kathryn A. Kraft 1988. Food preference, growth and survivorship in *Physella virgata*: Food quality of diatoms and green algae. M.S. Zoology, University of Oklahoma.

James E. Alexander, Jr. 1987. Feeding behavior of crayfish (*Procambarus acutus*) and escape behavior by snail prey (*Physa gyrina*). Ph.D. Zoology, University of Oklahoma.

Alan W. Groeger 1986. Primary productivity of a reservoir ecosystem. Ph.D. Zoology, University of Oklahoma. (B.L. Kimmel, co-advisor)

Todd A. Crowl 1984. Optimal foraging of large mouth bass of fish and crayfish as a function of water clarity. M.S. Zoology, University of Oklahoma.

Susan K. Peck 1984. Temperature selection by crayfish (*Orconestes virilis*) and behavioral changes induced by agonistic encounters. M.S. Zoology, University of Oklahoma.

Caryn C. Vaughn 1984. The adaptive morphology of case construction in the caddisfly, *Helicopsyche*. Ph.D. Zoology, University of Oklahoma.

William P. Magdych 1984. Multivariate analysis of salinity effects on mayfly populations along a complex river continuum. Ph.D. Zoology, University of Oklahoma.

Martha M. White 1981. Algal heterotrophy in a well-mixed, eutrophic reservoir. M.S. Zoology, University of Oklahoma. (B.L. Kimmel, co-advisor)

Shirley Starks 1980. Resource depression in fish-crayfish interactions. M.S. Zoology, University of Oklahoma.

Caryn C. Vaughn 1979. The effect of salinity and other environmental factors on the distribution of chironomids in the littoral zone of Lake Texoma, Oklahoma-Texas. M.S. Zoology, University of Oklahoma.

Elizabeth B. Rodgers 1975. The interactions of benthic dipterans as they affect the relationships between biomass and population density. Ph.D. Biology, Washington University. (O.J. Sexton, co-advisor)

Diane B. Seale. 1973. Impact of amphibian larval populations on an aquatic community. Ph.D. Biology, Washington University (O.J. Sexton, co-advisor)

## **RECENT GRADUATE STUDENT COMMITTEES**



Abhishek Kumar, 2016-present. Ph.D. Remote sensing of cyanobacteria blooms in large lakes. Department of Geography, University of Georgia.

Phillip Ashford, 2017-present. M.S. Remote sensing of macrophytes in Lake Seminole and spread of invasive species. Department of Geography, University of Georgia.

James Dyer, 2014-17. Ph.D. Flow regime and movement of freshwater shrimp assemblages. School of Environmental Sciences, Charles Sturt University, New South Wales, Australia. (External committee member)

Peter Novak, 2014-2017. Ph.D. Connectivity and dispersal of *Macrobrachium sinipes* in tropical rivers of northern Australia. Charles Darwin University, Darwin, Northern Territory, Australia. (External committee member)

Daniel Harris, 2012-16. Ph.D. Effects of oyster bed development on coastal shoreline habitats. Ecology, University of Georgia.

Craig Ramseyer, 2012-16. Ph.D. Long-term patterns of rainfall in the Caribbean and effects of landuse. Geography Department, University of Georgia.

Marcus Williams, 2012-16. Ph.D. Climate change impacts of irrigated agriculture on rainfall in the Georgia and Alabama. Geography Department, University of Georgia.

David Manning, 2011-2015 Ph.D. Nutrient cycling in Coweeta streams, Ecology, University of Georgia.

Omar Perez-Reyes, 2010-2015. Ph.D. Long term studies of growth and reproduction of freshwater shrimp, Luquillo Mountains, Puerto Rico. Fisheries and Watershed Science, Utah State University (External committee member).

Pedro Torres, 2007-2018, Ph.D. Stream ecology- Puerto Rico. Ecology, University of Georgia.

Sarah Bowen, 2011- 2016 Ph.D. Mosquito ecology and spread of West Nile virus. Ecology, University of Georgia.

Marcus Zokan, 2009-2015. Ph.D. Zooplankton ecology in Carolina Bays. Ecology, University of Georgia.

Amber Ignatius, 2011- 2015 Ph.D. Consequences of increased reservoir construction on river basins in southeastern Georgia. Geography Department, University of Georgia.

Douglas Patton, 2011-2014 Ph.D. Valuation of wetland ecosystem services. Agricultural Economics, University of Georgia.

Daniel Crescenzo, 2011-2013. Ph.D. Environmental ethics of panther re-introduction to the Southeastern United States, Department of Philosophy, University of Georgia.

Don Christy, 2010-2014 Ph.D. Water policy issues in Georgia. Ecology, University of Georgia.

William McDowell, 2010-2014 Ph.D. Distributions of *Corbicula* in Georgia rivers and responses to variable flow regimes. Ecology, University of Georgia.

Kristy Segal, 2010-2014. Ph.D. Effects of tropical agriculture on wetlands- toxicity and monitoring with *Bufo marinus* in Costa Rica. Ecology, University of Georgia.

Ashley Barfield. 2010-2012. M.A. Ecosystem services of pollinators. Agricultural Economics, University of Georgia.

Marcia Snyder, 2007-2012. Ph.D. Stream ecology – Costa Rica. Ecology, University of Georgia.

Ethell Vereen, Jr., 2007-2010, Ph.D. Water quality and agricultural impacts. Public Health, University of Georgia.

Nathan Pratt (2008-2010). M.S. Small mammal population dynamics at Horseshoe Bend. Ecology, University of Georgia.

Mark Galatowitsch, 2007-2010. M.S. Floodplain wetlands and insect life histories. Entomology, University of Georgia.

Rachel Katz, 2007-2011. M.S. Ecology- Stream ecology, Ecology, University of Georgia.

Danny O'Brien, 2007-2011. M.S. Ecology – Stream ecology, Ecology, University of Georgia.

Stribling Stuber, 2007-2010. M.S. Effects of land-use change on wetland ecology. Ecology, University of Georgia.

Chip Small 2005-2010. Ph.D. Leaf litter processing by tropical stream invertebrates as a function of dissolved nutrients. Ecology, University of Georgia.

Scott Connelly 2005-2009. Ph.D. Effects of chytrid fungi on tadpole mortality and tropical stream ecosystem function. Ecology, University of Georgia.

Aaron Wilson 2005-2008. Ph.D. Ecotoxicological studies of *Corbicula* in southeastern rivers. Public Health, University of Georgia.

Nicole Rivera, 2008-2010, Ph.D. Biology, Foraging ecology of freshwater crabs. University of Regensburg, Germany. (External committee member).

Pedro Raposeriro 2005-2009. Ph.D. Impacts of non-native crayfish on island lakes and streams. Departamento de Biologia, Universidade dos Azores, Portugal (External committee member).

Pablo J. Hernandez-Garcia 2006-2009. Tropical stream food webs in river networks. M.S. University of Puerto Rico, Rio Piedras, Institute for Tropical Ecosystem Studies, UPR Graduate School (External committee member).

Scott D. Tiegs, Ph.D., 2005-2006, Litter decomposition across multiple spatial scales in stream drainage networks. Institute of Integrative Biology (IBZ), ETH Zurich, Switzerland (External committee member).

Markus H. Schindler. 2005-2006. Functional leaf traits and biodiversity effects on litter decomposition in a stream. Institute of Integrative Biology (IBZ), ETH Zurich, Switzerland (External committee member).

Lindsay A. Stallcup 2005-2006. M.S. Effects of nutrient additions on tropical streams and detrital processing. Ecology, University of Georgia.

Effie Greathouse 2003-2006. Ph.D. Revision of the River Continuum Concept for insular tropical streams. Ecology, University of Georgia.

Marcelo Luis Ardon Sayao, 2003-2006, Ph.D. Effects of leaf litter quality on decomposition dynamics in lowland Neotropical streams. Ecology, University of Georgia.

## **POST DOCTORAL COLLABORATORS**

Dr. Wyatt Cross, University of Georgia. Food webs of tropical headwater streams. Analysis of ecological services in freshwaters.

Dr. Felipe Blanco, University of Georgia, Effects of roads on river food webs in tropical forest drainage networks.

Dr. Dana W. Seerley, University of Georgia. River basin development and food webs.

Dr. Nisikawa Usio, (Hokkaido University, Japan). Colorado State University. A network model of foodweb impacts of non-native crayfish on California streams.

Dr. Jose Rincon, (Universidad de Zulia, Venezuela). Colorado State University. Microbial and invertebrate processing of tropical riparian leaf-litter inputs to headwater streams.

Dr. Mark Pyron, (Ballstate University, Indiana) Colorado State University. Upstream migrations of freshwater snails in Puerto Rico.

### **OTHER RECENT COLLABORATORS**

John Loomis, Jorge Ramirez, Melinda Laituri, Ellen Wohl, and Diana Wall (Colorado State University), Todd Crowl (Utah State University), Fred N. Scatena (University of Pennsylvania), Luis Santiago and Elias Gutierrez (University of Puerto Rico), Jose Rincon (Universidad de Zulia, Venezuela), Ray Kopp (Resources for the Future), John Bergstrom (University of Georgia), Rebecca L. Moore (University of Georgia)

### **VIDEO PRODUCTIONS**

**2017.** "<https://player.vimeo.com/video/162427775?color=ffffff>" Freshwaters Illustrated, "In a headwater stream in a protected raiforest."

**2015.** Adaptations to extreme droughts: Learning to sustain southeastern freshwater ecosystem services through regional comparisons. A.P. Covich, A. Ignatius, K. McKay, J. McEntire, S. Golladay and S. Opsahl. 2009. A case study video presented to the Ecological Society of America's Millennium Conference on Water-Ecosystem Services, Drought, and Environmental Justice, Athens, Georgia.

### **BLOGS**

- Dealing with Drought: Coordinating Freshwater Management to Adapt to Extreme Weather. A.P. Covich. 2009. Weathervane- Resources For the Future. [http://www.rff.org/wv/archive/2009/07/16/]
- How climate change will impact America's freshwater resources. A.P. Covich. 2009. Around the Water cooler. [http://www.blogtalkradio.com/aroundthewatercooler/12/16/2009/]
- Climate change and freshwater. A.P. Covich. 2009. Around the Water Cooler. [http://www.blogtalkradio.com/aroundthewatercooler/09/30/2009/]

### **PARTICIPATION AND ORGANIZATION OF RECENT NATIONAL SYMPOSIA**

- Biodiversity of temperate and tropical rivers in a changing world: Research frontiers and future challenges. Ecological Society of America Centennial, Baltimore, August 2015.

- Insular tropical streams: Case studies of biotic responses to hurricanes, droughts, and landuse changes in Hawaii and Puerto Rico. Association for Tropical Biology and Conservation Annual Meeting, Honolulu, HI. July 2015.
- Stream macroinvertebrate response to disturbances in Neotropical streams: Recent advances and future directions. Annual Meeting, Society for Freshwater Science, Milwaukee, WI. May, 2015.
- What have we learned about tropical streams? How will they be affected by climate change? Society for Freshwater Science, Joint Aquatic Sciences Meeting, Portland, OR. May 2014.
- Lakes as sentinels of landscape change and biodiversity in the Southeast. Annual meeting of the Association of Southeastern Biologists, Athens, GA. 2012.

## **CURRENT POSITIONS OF RECENT UGA GRADUATES**

Stephen Shivers (PhD-Ecology) post-doctoral researcher, U.S. Environmental Protection Agency, Narragansett, Rhode Island.

Nick Marzolf (MS-Ecology), PhD student, North Carolina State University, Raleigh, NC with Professor Marcelo Ardon.

David Diaz (MS-Ecology), video production, Freshwaters Illustrated, Corvallis, OR.

Chelsea Smith. (MS-Ecology), aquatic ecologist, Joseph Jones Ecological Research Center, Georgia.

Carla Atkinson (MS-Ecology) completed her PhD with Caryn C. Vaughn at U. Oklahoma (Caryn is one of my former MS and PhD students!) and Carla is now an assistant professor, in Biology, University of Alabama.

Lindsey Sargent (MS-Ecology) is completed her PhD with David Lodge at Notre Dame University and is now on the faculty at the University of Florida..

Kauaoa Fraiola (MS-Ecology) completed his PhD in ecology at the University of California- Berkeley in 2015 ("Ecology and behavior of juvenile *Mugil cephalus* in Hawaiian streams") and now working on Hawaii with U.S. Fish and Wildlife Service.

Carol Flaute (MS-Ecology) completed a MS degree in Urban Planning with in the School of Environment and Design at UGA.

Julie McEntire (MS-Ecology) is the project manager for the Texas Commission on Environmental Quality's (TCEQ) Clean Rivers program.

Eva Whitehead Buckner (MS-Ecology) completed her PhD in vector ecology at the University of Florida-Gainesville and currently works on mosquito ecology and control in Manatee County, FL.

Gina Botello-Young (MS- Ecology) is working as an ecologist at the Tennessee Aquarium in Chattanooga, Tennessee.

Meredith Wright (MS-Ecology) is working at Rady Children's Institute for Genomic Medicine in San Diego after receiving at PhD at UGA's Savannah Rivers Ecology Lab and the Institute of Ecology.