

Todd D. Crail

Department of Environmental Sciences, University of Toledo
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PROFESSIONAL PREPARATION

Ph.D. University of Toledo, Biology (Ecology track); 2012
M.S. University of Toledo, Biology (Ecology track); 2007
B.A. Bluffton University, Biology; 1995

APPOINTMENTS

2012 – Present Lecturer, Department of Environmental Sciences, University of Toledo
2011 – 2012 Research assistant, Lake Erie Center, University of Toledo
2010 – 2012 Teaching assistant, University of Toledo
2008 – 2010 National Science Foundation GK-12 Graduate Fellow, University of Toledo
2007 - 2008 Research assistant, Lake Erie Center, University of Toledo
2005 - 2007 Teaching assistant, University of Toledo
2003 - 2005 Internet technologies developer, LearnShare, Toledo, OH
2001 - 2003 Internet technologies developer, Owens Corning, Toledo, OH
1999 - 2000 Sole proprietor – Sylvania Tropical Aquarium Store, Sylvania, OH
1995 - 1999 Internet technologies developer, Northshore Computer Solutions, Toledo, OH

TEACHING EXPERIENCE

Instructor for Freshman Year Experience (NSM 1000 Univ of Toledo) 2016-Present (Fall)
Instructor for Down to Earth Environmental Science (EEES-1130 Univ. of Toledo) 2012 – Present
Instructor for Environmental Problems Lab (EEES-1140 Univ. of Toledo) FA, SP 2012 - Present
Instructor for Introduction to Environmental Studies (EEES-2010 Univ. of Toledo) 2012 - Present
Instructor for Biodiversity Lab (EEES-2060 Univ. of Toledo) FA, SP 2012, FA 2016-Present
Instructor for Ecology Lab (EEES 3060 Univ. of Toledo) FA 2012 – FA Present (Fall)
Instructor for Senior Capstone Course (EEES 4970 Univ. of Toledo) SP 2014 – 2017 (Spring)
Instructor for Advanced Field Ecology (EEES 4890 Univ. of Toledo) SP 2013, FA 2014, 2015
Instructor for Graduate Field Ecology (EEES 68/8890 Univ. of Toledo) SU 2013, 2015- Present (Summer)
Teaching Assistant for Environmental Problems (EEES-1140 Univ. of Toledo) SP 2011.
Teaching Assistant for General Ecology Laboratory (EEES-3060 Univ. of Toledo) FA 2010, 2011.
Teaching Assistant for Special Topics: Diversity & Environmental Gradients (EEES-6980 Univ. of Toledo) SU 2010.
Teaching Assistant for Special Topics: Applying Ecological Theory (EEES-6980 Univ. of Toledo) SU 2010.
National Science Foundation GK-12 Fellow – High School Environmental Science, Biology. Scott High School,
Toledo, OH, Aug 2008 – May 2010. Teaching and science mentorship ten hours weekly at an urban high school.
Teaching Assistant for Aquatic Ecology Laboratory (EEES-4740, EEES-5740 Univ. of Toledo) FA 2007.
Teaching Assistant for Biodiversity Laboratory (EEES-2160 Univ. of Toledo) FA 2005, SP, FA 2006.

GRADUATE STUDENTS DIRECTED:

Brittani Furlong (MS 2016)

GRADUATE STUDENTS CO-DIRECTED:

Nicholas Bryan (MS 2013 - Moorhead), Christina Florence (MS 2016- Moorhead), Sara Guiher (MS 2017 – Bossenbroek)

GRADUATE STUDENT COMMITTEES:

Michelle Reed (MS 2012), Gwen McLaughlin (MS 2013), Christa Leopold (MS 2013), Blake Parquette (MS 2013), Adam Russel (MS 2014), Jamie Redway (MS 2014), Kelly Meinart (MS 2014), Jeanette Utter (MS 2014), Aaron Svoboda (MS 2014), Elaine Dunn (MS 2016), Jessica Sherman (PhD 2018).

UNDERGRADUATE STUDENT DEPARTMENT HONORS DIRECTED

Bryce Schide (FA 2013), Zach Stratton (SP 2014), Sara Guiher (FA 2014), Maureen Bogdanski (SP 2015), Caroline Beck (SP 2016)

UNDERGRADUATE STUDENTS DEPARTMENT HONORS CO-DIRECTED:

Philip Mathias (2009 - Bossenbroek), Kirk Zmijewski (2011- Becker), Kelsey Navarre (2011- Bossenbroek), Jonathan Sanders (2013 - Becker), James Moriarity (2014 - Gottgens), Darian Marinis (2014 - Weintraub), Jared Rogers (2014 – Martin-Hayden), Jeanna Meisner (2015-Bossenbroek), Wendy Stevens (2016-Bossenbroek)

PUBLICATIONS

Peer Reviewed First Author:

Crail, T.D. R.A. Krebs & D.T. Zanatta 2011. Unionid mussels from the nearshore zones in Lake Erie. *Journal of Great Lakes Research* 37:199-202.

Crail, T.D., J.F. Gottgens & A.E. Krause 2011. Fish community response to evolving channel complexity in an agricultural system. *Journal of Soil and Water Conservation* 66(5): 295-302.

Peer Reviewed Co-Author:

Zanatta, DT, Bossenbroek, JM, Burlakova, LE, **Crail, TD**, deSzalay, F, Griffith, TA, Kapusinski, D, Karateyev, AY, Krebs, RA, Meyer, ES, Paterson, WL, Prescott, TJ, Rowe, MT, Schloesser, DW, Walsh, MC. Distribution of Remnant Native Mussel (Unionidae) Assemblages in Coastal Lake Erie, Lake St. Clair, and Connecting Channels, Twenty-five Years After the Dreissenid Invasion 2015. *Northeastern Naturalist* xx (2015) xxx-xxx.

Burlakova, LE, Tulumello, BL, Karatayev, AY, Krebs, RA, Schloesser, DW, Paterson, WL, Griffith, TA, Scott, MW, **Crail, TD**, Zanatta, DT 2015. Competitive Replacement of Invasive Congeners May Relax Impact on Native Species: Interactions among Zebra, Quagga, and Native Unionid Mussels. *PLOS ONE* DOI:10.1371 (2014)

Bryan, N., **Crail, T.D.**, Moorhead, D.L. 2014. Habitat characteristics of a unionid refuge in the thermal plume of a power plant in western Lake Erie. *Journal of Great Lakes Research*. 40 (2014) 699-704.

Bryan, N.J., C. Florence, D.L. Moorhead & **T.D. Crail** 2013. The presence of a native unionid mussel fauna in an exotic bivalve substrate. *Journal of Great Lakes Research* 39 (2013) 449-454.

Becker, R.H., K.A. Zmijewski & **T.D. Crail** 2013. Seeing the forest for the invasives: mapping buckthorn in the Oak Openings. *Biological Invasions* 15: 315-326.

In Review:

Bossenbroek, J.M., Burlakova, LE, **Crail, TD**, Karatayev, AY, Krebs, RA, Zanatta, DT. Modelling habitat of freshwater mussels (Bivalvia: Unionidae) in the lower Great Lakes 25 years after the Dreissena invasion (*Accepted to Freshwater Science*)

In Preparation:

Crail, T.D., J.M. Bossenbroek & J.F. Gottgens (*In Prep* to Fisheries). Shifts in resource utilization among a benthic fish community.

Other Publications:

Grabarkiewicz J.D. & **T.D. Crail**, 2008. Three Years of Unionid Surveys in Swan Creek, Lower Maumee River Watershed, Lucas Co., OH. Final Report to the Ohio Division of Wildlife, Toledo Naturalists Association, and Metroparks of the Toledo Area: 41pp.

Grabarkiewicz J.D. & **T.D. Crail**. 2007. A new population of rayed bean (*Villosa fabalis*) in a small tributary of the Maumee River, Lucas County, OH. *Ellipsaria* 11(1):7.

Crail, T.D., J.F. Gottgens & P.T. Mathias. 2007. Status and distribution of native unionid mussels (Unionidae) in the coastal wetlands of the Winous Point Marsh Conservancy. Final Report to the Winous Point Marsh Conservancy: 21 pp.

Crail, T.D. & J.F. Gottgens. 2007. Testing the impact of plant colonization on the fish community in headwaters of the Ottawa River, northwest Ohio. Final report to Ohio Lake Erie Commission: 41 pp.

Crail T.D. 2006. System design for the ultimate native fish aquarium. *American Currents*, Vol. 32, No. 2.

FUNDED PROPOSALS

Multiple University & Agency 2010 (closed). *Conservation of native freshwater mussel refuges in Great Lakes coastal zones*. Great Lakes Fish and Wildlife Restoration Act Pre-Proposal 2010 (closed).

- D. Zanatta, Central Michigan U, L. Burlakova, Buffalo State College, A. Karatayev, Buffalo State College, R. Krebs, Cleveland State U, M. Hoggarth, Otterbein College, F. A. de Szalay, Kent State U., J. Bossenbroek, U of Toledo, E. Meyer, PA Nat. Heritage Prog., M. Walsh, PA Nat. Heritage Prog., M. Schlesinger, NY Nat. Heritage Prog., R. Haas, MI DNR, **T. Crail, U. of Toledo**, P. Badra, MI Nat. Features Inventory, N. Welte, PA Fish and Boat Comm., L. Holst, NY Dept. of Env. C., \$348,181.

T.D. Crail 2010 (closed). Documenting hidden fish diversity in the Maumee Watershed. Toledo Naturalists Association, \$700.

Gottgens J.F. & **T.D. Crail**, 2008 (closed). The Honey Creek Targeted Watershed Program Proposal. U.S Environmental Protection Agency (\$60,000 – UT share)

Gottgens J.F. & **T.D. Crail** 2007 (closed). Mussel Survey of Winous Point Marshes. Winous Point Marsh Conservancy, \$5,000.

Grabarkiewicz, J.D. & **T.D. Crail**, 2007 (closed). *The travellin' fish show*. The North American Native Fishes Association, \$1000.

Gottgens J.F. & **T.D. Crail**, 2006 (closed). Survey Fish Diversity: Testing the Impact of Vegetative Encroachment. Lake Erie Protection Fund, Lake Erie Commission, \$9,576.

INVITED PRESENTATIONS

2016

- Landscape-scale Processes in Oak Openings Ecological Communities –Fire Practitioners Field Day (Green Ribbon Initiative), Toledo, OH
- The model is wrong, but is it useful? – Collective Impacts on the Oak Openings Region (Green Ribbon Initiative), Toledo, OH

2014

- The Globally Unique Lakeplain Oak Openings. Ohio Chapter of The Nature Conservancy Board Meeting, Columbus, OH
- Northwest Ohio's Amazing Natural Landscape. The Kuebeck Forum on Nature and Environment. Bowling Green, OH

2013

- The Nightmare on Dorr Street: The Role of Landscape Scale Processes in Structuring Community at the Irwin Prairie State Nature Preserve. Ohio Botanical Symposium, Columbus, OH

2012

- Therapeutic Landscapes for Healing; Using New AGE (Active Green Environment) to Create Outdoor Experiences. Discussion Panel - GreenTown Conference, Toledo, OH
- It takes a village: beneficial interactions among North American fish communities. Banquet speaker – North American Native Fishes Association annual convention, Salt Fork State Park and Conference Center, Cambridge, OH Sept. 2012

2011

- War and peace in benthic fish communities: Habitat utilization and assemblage across a varying resources base. Virginia Tech, Blacksburg, VA.

2010

- From nowhere to naturalist – The interpretation of Mr. Todd Crail. Bluffton University, Bluffton, OH.
- A tale of two streams. Invited lab activity with the Aquatic Ecology course. University of Toledo, Toledo, OH.
- Ecological dimension and adaptation of fish community in Ten Mile Creek. Invited field trip and lab activity with the Fall Field Ecology course. Lourdes College, Sylvania, OH
- Aquatic Diversity of the Toledo Area. GK-12 Summer Course for Fellows and Teachers, University of Toledo, Toledo, OH.
- Ecological dimension and adaptation of fish community in Ten Mile Creek. Invited field trip and lab activity with the Spring Field Ecology course. Lourdes College, Sylvania, OH.

2009

- Aquatic Diversity of the Toledo Area. GK-12 Summer Course for Fellows and Teachers, University of Toledo, Toledo, OH.

2006

- Ecology of the Unionidae of Southeast Michigan. Invited seminar and field trip, Washtenaw Community College, Ann Arbor, MI.
- Ecology of the Oak Openings Region. Invited seminar and field trip, Owens Community College, Toledo, OH.

CONTRIBUTED PRESENTATIONS

- Guiher, S.N., J.M. Bossenbroek, **T. Crail**. 2017. Development of the Oak Openings Invasive Species Control Plan. Forum for Local Natural History and Research. Toledo, OH. January.
- Guiher, S.N., J.M. Bossenbroek, **T. Crail**. 2017. Oak Openings Region Invasive Species Strategy. Green Ribbon Initiative Partner Workshop. Swanton, OH. June.
- Sherman Collier, J.J., J.M. Bossenbroek, **T. Crail**, C.M. Mayer, J.M. Boase, J.C. Chiotti, C.S. Vandergoot, K. Bekker, and E. Weimer. 2017. Reintroducing Lake Sturgeon (*Acipenser fulvescens*) to the Maumee River, OH: Habitat Assessments Using Habitat Suitability Index Models. 147th American Fisheries Society Meeting, Tampa, FL. August.
- Guiher, S.N., J.M. Bossenbroek, **T. Crail**. 2016. Ecological Niche Modeling of Terrestrial Invasive Plants in the Oak Openings Region. 7th Annual Meeting of the Michigan Consortium of Botanists. Allendale, MI. October.
- Guiher, S.N., J.M. Bossenbroek, **T. Crail**. 2016. Oak Openings Region Invasive Species Strategy. Collective Impact on the Oak Openings Scientists and Practitioners Forum. Toledo, OH. October.
- Guiher, S.N., J.M. Bossenbroek, **T. Crail**. 2016. Neighborhood Watch: Learn to Identify and Manage Invasive Plants in Your Yard. Lake Erie Center Summer Naturalist Series. Oregon, OH. July.
- Sherman, J.J., J.M. Bossenbroek, **T. Crail**, C.M. Mayer, J.M. Boase, J.C. Chiotti, and C.S. Vandergoot. 2016. A habitat suitability index model to assess lake sturgeon reintroduction in the Maumee River, Ohio. North American Sturgeon and Paddlefish Society Meeting, Hood River, OR. September.
- Sherman, J.J., J.M. Bossenbroek, **T. Crail**, C.M. Mayer, J.M. Boase, J.C. Chiotti, and C.S. Vandergoot. 2016. A habitat suitability index model for possible lake sturgeon (*Acipenser fulvescens*) reintroduction in the Maumee River. 59th International Conference on Great Lakes Research, Guelph, ON. June.
- Sherman, J.J., J.M. Bossenbroek, **T. Crail**, C.M. Mayer, J.M. Boase, J.C. Chiotti, and C.S. Vandergoot. 2016. A habitat suitability index model for possible lake sturgeon (*Acipenser fulvescens*) reintroduction in the Maumee River. Midwest Graduate Research Symposium, Toledo, OH. April.
- Sherman, J.J., J.M. Bossenbroek, **T. Crail**, C.M. Mayer, J.M. Boase, J.C. Chiotti, and C.S. Vandergoot. 2016. A habitat suitability model for possible lake sturgeon (*Acipenser fulvescens*) reintroduction in the Maumee River. OSU/DNR Annual Research Review, Columbus, OH. January.
- Sherman, J.J., J.M. Bossenbroek, **T. Crail**, C.M. Mayer, J.M. Boase, J.C. Chiotti, and C.S. Vandergoot. 2016. A habitat suitability model for possible lake sturgeon (*Acipenser fulvescens*) reintroduction in the Maumee River. 76th Midwest Fish & Wildlife Conference, Grand Rapids, MI. January.
- T.D. Crail** 2015. Landscape-scale processes you need to understand to successfully manage Oak Openings ecological communities. Metroparks Oak Openings Research Forum, Toledo, OH.
- C.E. Beck & **T.D. Crail** 2015. Status of the Orange Fringed Orchid (*Platanthera ciliaris*) Reintroduction in the Oak Openings Region. Metroparks Oak Openings Research Forum, Toledo, OH.
- B.N. Furlong & **T.D. Crail** 2015. Anuran Monitoring at Irwin Prairie State Nature Preserve 2013-2014. Metroparks Oak Openings Research Forum, Toledo, OH.
- S. Guiher & **T.D. Crail** 2015. Boots and Buckets: Interpreting citizen science data from the vernal pool monitoring program of the Metroparks of the Toledo Area, Lucas County, Ohio. Metroparks Oak Openings Research Forum, Toledo, OH.
- A. Seaman & **T.D. Crail** 2015. Applying plant monitoring data: Did aggressive management degrade rare plant communities in the Tornado Alley corridor? Metroparks Oak Openings Research Forum, Toledo, OH.
- T.D. Crail** 2014. The magnificent classroom: project-based science and service learning in the Oak Openings region. Natural Areas Conference, Dayton, OH.
- T.D. Crail** 2014. Reintroduction of the Orange Fringed Orchid in the Oak Openings region. Metroparks Oak Openings Research Forum, Toledo, OH.
- C.E. Beck & **T.D. Crail** 2014. The influence of bracken density on orange fringed orchid blooms in the Oak Openings region of Ohio. Metroparks Oak Openings Research Forum, Toledo, OH.
- B.N. Furlong & **T.D. Crail** 2014. Anuran monitoring at Irwin Prairie State Nature Preserve 2013. Metroparks Oak Openings Research Forum, Toledo, OH.
- A.K. Ludwig & **T.D. Crail** 2014. The effects of brush management on red baneberry at Irwin Prairie State Nature Preserve. Metroparks Oak Openings Research Forum, Toledo, OH.

- D.N. Marinis, **T.D. Crail**, M.N. Weintraub 2014. Soil properties in high and low quality dry sand prairies. Metroparks Oak Openings Research Forum, Toledo, OH.
- M. Roze & **T.D. Crail** 2014. The effects of brush pile burning at Irwin Prairie. Metroparks Oak Openings Research Forum, Toledo, OH.
- J. Sherman, D.M. Moorhead, **T.D. Crail** 2014. Assessing impacts of environmental engagement of students using the New Ecological Paradigm (NEP) Scale. Metroparks Oak Openings Research Forum, Toledo, OH
- J. Moriarity, J.F. Gottgens, **T.D. Crail** 2014. Comparing two different fish sampling methods to evaluate fish communities of the Ottawa River, Lucas County, OH. National Conference on Undergraduate Research, Lexington, KY.
- T.D. Crail** 2013. The magnificent classroom: project-based science and service learning in the Oak Openings region. Metroparks Oak Openings Research Forum, Toledo, OH.
- C.E. Beck, R.L. Mapes, **T.D. Crail** 2013. Opening the Oak Openings: Review and Summary of the Oak Openings Literature. Metroparks Oak Openings Research Forum, Toledo, OH
- D.N. Marinis, **T.D. Crail** 2013 The effect of two soil organic matter removal treatments at the Southview Savanna. Metroparks Oak Openings Research Forum, Toledo, OH.
- K. Friemoth, D.L. Moorhead, **T.D. Crail** 2013. Stem density and biomass of invasive buckthorn in Irwin Prairie State Nature Preserve. Metroparks Oak Openings Research Forum, Toledo, OH
- J.D. Sanders, R.H. Becker, **T.D. Crail** 2013. Inundation potential from agricultural ditches in Irwin Prairie State Nature Preserve. Metroparks Oak Openings Research Forum, Toledo, OH.
- C. Florence, N. Bryan, D.L. Moorhead, **T.D. Crail** 2013. Are thermal plumes from Coal-fired Power Plants creating a refuge for Unionid mussels in the Western Basin of Lake Erie? International Association of Great Lakes Research, Lafayette, IN.
- N.J. Bryan, C.V. Florence, D.L. Moorhead, **T.D. Crail** 2013. Impacts of Water discharge from a coal-fired power plant on Native Unionids in Western Lake Erie. International Association of Great Lakes Research, Lafayette, IN.
- A. Russell, D.L. Moorhead, **T.D. Crail** 2013. The relationship between the round goby and fish communities of Lake Erie tributaries. International Association of Great Lakes Research, Lafayette, IN.
- N.J. Bryan, C.V. Florence, D.L. Moorhead, **T.D. Crail** 2012. Impacts of water discharge from a coal-fired power plant on native unionids in Western Lake Erie. IAGLR annual conference. Cornwall, ON, Canada.
- T.D. Crail**, J.M. Bossenbroek, J.L. Wilson & J.A. Coombs 2011. Habitat utilization benchmarks of benthic fish in the Pigeon River Restoration. Southeastern Fishes Council, Chattanooga, TN
- T.D. Crail** & J.M. Bossenbroek 2011. Different Riffles, Same Species Space: Habitat Utilization and Partitioning in Darter Communities of the Ohio River Basin. Joint Meeting of Ichthyologists and Herpetologists, Minneapolis, MN.
- L.R. Merry, L.T. Olsen, **T.D. Crail** & J.M. Bossenbroek 2011. Quantifying the Habitat Utilization of Darters in the Central Great Lakes Region. Joint Meeting of Ichthyologists and Herpetologists, Minneapolis, MN.
- Gottgens JF, N.R. Tessler **T.D. Crail** & J.D. Selden 2011. Fishes and ditches: Enhancing ecological functions of agricultural drainage channels. Conference of the Society of Wetland Scientists, Prague, CR.
- Zmijewski, K.A., **T.D. Crail** & R.H. Becker 2011. Hydrologic controls on the distributional characteristics of glossy buckthorn (*Frangula alnus*) thicket: a study in the Oak Openings Regions of NW Ohio. Joint Northeastern/North-Central Section Meeting of the Geologic Society of America, Pittsburg, PA.
- Navarre, K, **T.D. Crail** & J.M. Bossenbroek, 2011. Mapping the habitat characteristics of a population of orange fringed orchid (*Plantanthera ciliaris*) in the Oak Openings Region. Oak Openings Research Forum, Toledo, OH.
- Zmijewski, K.A., **T.D. Crail** & R.H. Becker 2011. The distributional characteristics of glossy buckthorn (*Frangula alnus*) thicket in the Oak Openings Region. Oak Openings Research Forum, Toledo, OH.
- Crail, T.D.** & J.M. Bossenbroek, 2010. Interspecific induced shifts of habitat usage among a benthic community of fishes. Southeastern Fishes Council. Athens, GA.
- Crail, T.D.**, J.M. Bossenbroek & J.F. Gottgens, 2010. Wind-derived seiches as a means for detecting and monitoring the unionid community in the western basin of Lake Erie. Millennium Conference. Windsor, ON.
- Crail, T.D.**, J.M. Bossenbroek & J.F. Gottgens, 2009. Niche dimension of *Etheostoma* darters in the Ohio River Basin at multiple scales. American Fisheries Society, Nashville, TN.
- Crail, T.D.**, J.M. Bossenbroek & J.F. Gottgens, 2009. A multiscale analysis of *Etheostoma* darter habitat in the Ohio River Basin. Southeastern Fishes Council, Lake Guntersville, AL.
- Crail, T.D.**, J.M. Bossenbroek & J.F. Gottgens, 2009. Wind-derived seiches as a means for detecting and monitoring the unionid community in the western basin of Lake Erie. International Association for Great Lakes Research, University of Toledo, Toledo, OH.
- Tessler, N.R., J.D. Selden, **T.D. Crail** & J.F. Gottgens, 2009. Use of Agricultural Streams in Northwestern Ohio as Spawning Habitat by Native Fishes: Impact of Habitat Heterogeneity. 2009 Annual NANFA Convention, Tampa, Florida.

- Blosser J., B. Bodamer, **T. Crail**, C. Kolinski, G. Mentzer, W. Penamon & C. Stepien 2009. River of Shame Lesson Plan. Lesson Plan Session, National Science Foundation Annual GK-12 Conference, Washington D.C.
- Crail, T.D.** & J.F. Gottgens, 2009 Testing the impact of vegetative colonization on fish community in the headwaters of the Ottawa River, northwest Ohio. STEM Science Poster Session, National Science Foundation Annual GK-12 Conference, Washington, D.C.
- Crail, T.D.** & J.F. Gottgens, 2008. Testing the impact of vegetative colonization on fish community in the headwaters of the Ottawa River, northwest Ohio. Annual Meeting of the Ohio Academy of Science, Toledo, OH.
- Gottgens J.F., **T.D. Crail** & A.I. Arceo, 2008. Contrasting fish communities upstream and downstream of a dam in the Ottawa River, Northwest Ohio. Phase I of a dam removal study. Annual Meeting of the Ohio Academy of Science, Toledo, OH.
- Crail, T.D.** & J.F. Gottgens, 2008. Testing the impact of vegetative colonization on fish community in the headwaters of the Ottawa River, northwest Ohio. Ecological Society of America, Milwaukee, WI.
- Gottgens J.F., **T.D. Crail** & A.I. Arceo, 2008. Contrasting fish communities upstream and downstream of a dam in the Ottawa River, Northwest Ohio. Phase I of a dam removal study. Annual Meeting of the Ohio Academy of Science, Toledo, OH.
- Crail T.D.** & J.F. Gottgens, 2007. Testing the impact of plant colonization on fish communities in agricultural ditches of the Ottawa River, Northwest Ohio. Joint Meeting of Ichthyologists and Herpetologists, St. Louis, MO.
- Crail T.D.** & J.F. Gottgens, 2007. Testing the impact of plant colonization on fish communities in agricultural ditches of the Ottawa River, Northwest Ohio. Conference of the International Association of Great Lakes Researchers, College Station, PA.
- Crail T.D.** & J.F. Gottgens, 2006. Testing the impact of vegetative colonization on the fish community in the headwaters of the Ottawa River, northwest Ohio. Lake Erie Conference, Lorain, OH.
- Crail T.D.** & J.F. Gottgens, 2006. Testing the impact of vegetative colonization on the fish community in the headwaters of the Ottawa River, northwest Ohio. Conference of the International Association of Great Lakes Researchers, Windsor, ON.
- Crail T.D.** & J.D. Grabarkiewicz, 2005. Aquatic Fauna of the Oak Openings Region. Metroparks of the Toledo Area Oak Openings Research Forum, Toledo, OH.
- Gottgens J.F., **T.D. Crail** & A.I. Arceo, 2005. Quantifying the fish community response to dam removal: The case of the Ottawa River, northwest Ohio. Geology Society of America Abstracts with Programs Vol. 38, No. 4., Akron, OH.

AWARDS

- 2017 – University of Toledo Outstanding Teacher Award
 2014 – College of Natural Science and Mathematics Excellence in Teaching Award
 2014 – University of Toledo Rathbun Award for Service and Outreach
 2010 – Dr. Robert Brundage Scholarship

OUTREACH and PUBLIC ENAGAGEMENT

2016

- Northwest Ohio's Amazing Natural Landscape – Wood County Ohio Certified Volunteer Network, Bowling Green, OH

2015

- The Problem is the Cure. Oak Openings Chapter of Wild Ones, Sylvania, OH
- The Metal House Farm and Preserve Garden Tour. Oak Openings Chapter of Wild Ones, Toledo, OH
- Who lives there in that river!? Sylvania Youth Conservation Corp, Sylvania, OH
- Late Bloomers of the Oak Openings Region. Toledo Naturalists Association, Toledo, OH

2014

- Spring Peeper Fever at Irwin Prairie. Toledo Naturalists Association, Toledo, OH
- Geology and Ecology of the Oak Openings Region. Green Ribbon Association Blue Week, Toledo, OH
- Prairie Delights, Oh My! Kitty Todd Preserve. Toledo Naturalists Association, Toledo, OH
- Late Bloomers of the Oak Openings Region. Toledo Naturalists Association, Toledo, OH
- The Nightmare on Dorr Street: The Role of Landscape Scale Processes in Structuring Community at the Irwin Prairie State Nature Preserve. Michigan Botanical Society, Ann Arbor, MI

2013

- The geologic context for, well, everything in the Toledo Area. Toledo Naturalists Association, Toledo, OH.
- Spring Peeper Fever at Irwin Prairie. Toledo Naturalists Association, Toledo, OH
- Geology and Ecology of the Oak Openings Region. Green Ribbon Association Blue Week, Toledo, OH

- Swim with the Fishes at Sharon Mills Park, Manchester, MI. Toledo Naturalists Association, Toledo, OH
- Prairie Delights, Oh My! Kitty Todd Preserve. Toledo Naturalists Association, Toledo, OH
- The Ecology and Geology of the Maumee River. Ohio Certified Volunteer Naturalist training program, Toledo, OH

2012

- Fishes of the western basin (for all ages!) University of Toledo Lake Erie Center, Toledo, OH
- It Takes a Village: Beneficial Interactions Among North American Fish Communities, Toledo Naturalists Association, Toledo, OH
- The Geology, Ecology and Restoration of Irwin Prairie Irwin State Nature Preserve, Oak Openings Blue Weekend, Toledo, OH

2011

- The Secret Sex Lives of Unionid Mussels. Toledo Area Student Watershed Watch 2011, Toledo, OH.
- From creek-crawling kid to fish professor : One man's journey through multiple tiers of scientific engagement (And how his experience relates to you). North American Native Fishes Association, Roanoke, VA.
- Darters – The Warblers of the Water World. Toledo Naturalists Association, Toledo, OH.
- Lucas County Big Day for Fishes - Field trip sampling four aquatic environments across Lucas County for Fishes, Toledo Naturalists Association, Toledo, OH.

2010

- The Secret Sex Lives of Unionid Mussels. Toledo Area Student Watershed Watch 2010, Toledo, OH.
- Darters – The Warblers of the Water World. Toledo Naturalists Association, Toledo, OH.
- Macroinvertebrate Casserole! – Lecture and lab activity, Lake Erie Center Summer Camp, Oregon, OH.
- The Maumee River Drainage Network - It Flows Downhill. Friends Earthcare Witness, Bowling Green, OH.
- Lucas County Big Day for Fishes - Field trip sampling four aquatic environments across Lucas County for Fishes, Toledo Naturalists Association, Toledo, OH.
- Geologic and Botanical Context for the Michigan Botanical Society Spring 2010 Foray, Perrysburg, OH.
- Licking the Wounds – An overview of Toledo Area streams: Their Provenance, Perils & Progress, Start High School , Toledo, OH.
- Meet Your Stream – Fishes of the Blanchard River. Field trip with the Toledo Naturalists Association, Findlay, OH.
- The Secret Lives of Unionid Mussels. Washtenaw County Parks, Milan, MI.
- Enhancing Environmental Education and Careers: Restoration Project for the Ottawa River at the University of Toledo. Toledo Early College High School, Toledo, OH.

2009

- The Secret Sex Lives of Unionid Mussels. Royal Oak Nature Society, Royal Oak, MI.
- The Secret Sex Lives of Unionid Mussels. Toledo Area Student Watershed Watch 2009 Keynote Speaker, Toledo, OH.
- Meet Your Stream – Fishes of the Maumee River. Field trip with the Maumee Valley Chapter of the National Wild Turkey Federation Annual Kids Day, Grand Rapids, OH.
- Meet Your Stream – Fishes and Mussels of the River Raisin. Field trip with the Toledo Naturalists Association, Toledo, OH.
- See Real Live Fish Up Close – the Field Trip! Field trip with Steps For Kids, Ann Arbor, MI.
- Farmertodd Institute for Senior Hiatus (FISH). Field trip with area high school Seniors during their Senior Projects to understand local fish ecology. Toledo, OH.
- An Aquatic Primer – Careers in Aquatic Systems, Northview High School, Sylvania, OH.
- Mussel Fauna of the Swan Creek Watershed. Toledo Naturalists Association, Toledo, OH.
- See Real Live Fish Up Close! Steps for Kids, Ann Arbor, MI. <http://www.stepsforkids.org>

2008

- Discovering hidden life in the Maumee River watershed. Annual Banquet Keynote, Lucas County Soil and Water District, Toledo, OH.
- The Oak Openings Region from the Ground Up: Geological Processes Founding Incredible Biodiversity. Ohio Prairie Conference Keynote Speaker, Toledo, OH.
- Meet Your Stream – Fishes and Mussels of the Maumee River. Field trip with the Toledo Naturalists Association, Toledo, OH.
- *A Guide to the Common Fishes of the Toledo Area.*
- Snorkeling North America's Waterways. Southwest Michigan Aquarium Society, Kalamazoo, MI.

2007

- The Oak Openings Region from the Ground Up: Geological Processes Founding Incredible Biodiversity. Michigan Botanical Society, Ann Arbor, MI.
- North American Pearly Mussels: Who you callin' Fat Mucket?! Toledo Naturalists Association, Toledo, OH.
- Fear Not the Deep Substrate! Convention of the North American Native Fishes Association, Banquet Speaker, Greensboro, NC.
- *The travellin' fish show*. Interpretive poster printed with a grant from the North American Native Fishes Association.
- *40 feet at the Southview Prairie*. Interpretative sign placed along the University Parks Bike Path at the Sylvania Southview prairie remnant.

2006

- Native Plant Gardens – Tomorrow's Home? Toledo Chapter of Wild Ones, Toledo, OH.
- A Simple Headwater Sample Design for Amateurs (That the Professionals Will Want to Use Too). Convention of the North American Native Fishes Association, Cape Girardeau, MO.
- Meet Your Stream – Fishes and Mussels of the River Raisin. Field trip with the Washtenaw County Park district, Ann Arbor, MI.
- *Freshwater Mussels of the Maumee River*. Interpretative display in the Department of Environmental Sciences, University of Toledo, Toledo, OH.
- *Freshwater Mussels of the Maumee Drainage*. Field guide to the Unionid fauna of the Maumee River, co-written with Jeff Grabarkiewicz and printed by the Ohio Environmental Education Fund and the Lucas Soil and Water Conservation District.
- The Karner Blue Butterfly Reintroduction to the Oak Openings Region - A Look at a Successful Federally Endangered Animal Reintroduction. Toledo Chapter of Wild Ones, Toledo, OH.
- North American Pearly Mussels: Who you callin' Fat Mucket?! Toledo Chapter of Wild Ones, Toledo, OH.
- Native Plants – A weed by any other name. Toledo Seed Swap, Toledo, OH.

2004

- Meet Your Stream - University of Toledo Honors Service Learning/Community Service After School Enrichment Program
- Native Fish – Jewels in our Streams. Lourdes College, Sylvania, OH.
- Native Fish – Jewels in our Streams. Maumee Valley Country Day School, Toledo, OH.

MEDIA COVERAGE

- Quoted in "Ecology class works to protect rare wet prairie ecosystem", UT News, Oct 16, 2014
- Quoted in "A changing Maumee River no longer home for some species", Toledo Blade, July 6, 2014
- Quoted in "Increase in Ohio's Darter fish populations signal healthier waterways", Columbus Dispatch, Apr 6, 2014
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- Quoted in "Irwin Prairie Preserve benefits from ecology students' volunteer, research efforts", UT News, May 4, 2012
- Quoted and photography in "Students get back to their roots", The Independent Collegian, April 28, 2011.
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- Interviewed on *Environmentally Sound with Larry Burns*. WJR760 April 27, 2010.
- Quoted in "High school students help investigate large fish kill." Ohio Outdoor News, February 26, 2010.
- Quoted in "UT student to receive Brundage Scholarship", The Toledo Blade, January 18, 2010.
- Quoted in "Scott's watershed team gets immersed in work". The Toledo Blade, December 13, 2009.
- "Fishing for Knowledge at UT". The Toledo Blade, September 20, 2007.
- Quoted in "Wild Ones Relocate Native Plants, Soil from Development Sites." The Maumee Mirror, March 22, 2007.
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