

Maureen Elizabeth Clayton, Ph.D.

Associate Professor, Biology
University of Northern Iowa
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Professional Experience

2016 – Associate Dean, College of Humanities, Arts and Sciences, University of Northern Iowa
2004 – Associate Professor, Biology and Environmental Science, University of Northern Iowa

2006 – 2013 Director, Environmental Programs, University of Northern Iowa

1998 – 2004 Assistant Professor, Biology and Environmental Science, University of Northern Iowa

1996 – 1998 Postdoctoral Investigator, Swiss Federal Institute for Environmental Science and Technology (EAWAG)

1996 Postdoctoral Investigator, Woods Hole Oceanographic Institution

Education

Ph.D. 1996 (Biological Oceanography) Massachusetts Institute of Technology / Woods Hole Oceanographic Institution Joint Program in Oceanography and Oceanographic Engineering
Dissertation: Lipoproteins and heat shock proteins as measures of reproductive physiology in the soft shell clam *Mya arenaria*

B.S. 1990 (Marine Science) Eckerd College, St. Petersburg, FL
Senior Honors Thesis: The relationship between toxin production and phosphate availability in the Florida red tide dinoflagellate *Gymnodinium breve*

Research Interests

- Development and use of biomarkers of the effects of environmental contaminants
- Sublethal effects of organic, organometallic, and heavy metal contaminants on marine and freshwater organisms
- Cyanobacterial toxins
- Sublethal effects of environmental contaminants on human cells
- The impact of nutrient loading on primary production and algal species composition in lakes
- Remediation of phosphorus contamination in surface waters
- Remote sensing as a tool for monitoring water quality

Publications

Clayton, M.E., R. Steinmann** and K. Fent. 2000. Different expression patterns of heat shock proteins hsp 60 and hsp 70 in zebra mussels (*Dreissena polymorpha*) exposed to copper and tributyltin. *Aquatic Toxicology* 47:213-226.
Clayton, M.E. April 30, 2001. Microcystin-LR: a potential contaminant of concern for Iowa surface waters. Technical Report prepared for the Iowa State Water Resources Research Institute.
Dhanwada, K.R., Y. Deng** and M.E. Clayton. 2003. Effects of the pesticides atrazine, metolachlor and diazinon and binary mixtures on proliferation of human fibroblasts. *International Journal of Global Health* 2(2):21-36.
Clayton, M.E., S. Liegeois* and E.J. Brown. 2004. Phosphorus sequestration in lake sediment with iron mine tailings. *Soil and Sediment Contamination* 13(5):519-529.
Iqbal, M.Z., E.J. Brown, and M.E. Clayton. 2006. Distribution of phosphorus in a biologically restricted lake in Iowa, USA. *Journal of Hydrology* 326:349-366.

- Schwemm*, A.K., R. Pasker*, M.E. Clayton and E.J. Brown. 2006. Phosphorus sorption by sediment from wetlands in the Cedar River Watershed. *American Journal of Undergraduate Research* 5(3):21-28.
- Sugumaran, R., N. Green** and M.E. Clayton. 2007. Monitoring intra-annual water quality variations using airborne hyperspectral remote sensing data in Iowa lakes. *Journal of Applied Remote Sensing* 1:13533-13545.
- Iqbal, M.Z. and M.E. Clayton. 2021. Designing an interdisciplinary field and lab methods course in hydrology to integrate STEM into undergraduate water curriculum. *Journal of STEM Education* 21(1):58-67.

* indicates undergraduate student coauthor, ** indicates graduate student coauthor

Graduate Student Research Supervision

David Dyer	M. S.	UNI	1998-2000	Major advisor
Estelle Pircher	M. S.	UNI	1998-2000	Major advisor
Lori Covington	M. S.	UNI	2000-2002	Major advisor
Nikki Carmichael	M.S.	UNI	2004-present	Major advisor
Roland Steinmann	Dipl. Biol.	ETH/EAWAG	1997	Co-advisor (with Karl Fent)
Alissa Schultz	M. S.	UNI	1999-2001	Co-advisor (with Ed Brown)
Anil Shrestha	M.S.	UNI	2006-2008	Co-advisor (with M. Iqbal)
Tyler Griffin	M.S.	UNI	2007-present	Co-advisor (with Ed Brown)
Amanda Clarkson	M.S.	UNI	2008-present	Co-advisor (w/CHeinzel & MIqbal)
Lionel Rouzic	M. S.	UNI	1998	Committee member
Dawn Keller	M. S.	UNI	1999-2002	Committee member
Tami Reuter	M.S.	UNI	1999-2002	Committee member
Irina Vyazunova	M.S.	UNI	1999-2001	Committee member
Irina Ustyugova	M.S.	UNI	1999-2001	Committee member
Brian Anderson	M.S.	UNI	2000-2002	Committee member
Rick Bauer	M.S.	UNI	2001	Committee member
Maria Urice	M.S.	UNI	2001-2002	Committee member
Michelle Manske	M.S.	UNI	2001-2002	Committee member
Eric O'Brien	M.S.	UNI	2001-2004	Committee member
Matt Fisher	M.S.	UNI	2001-2005	Committee member
Yijun Deng	M.S.	UNI	2001-2003	Committee member
Jacinta Uzoigwe	M.S.	UNI	2003-2004	Committee member
Jon Eastman	M.S.	UNI	2003-2004	Committee member
Elodie Pasco	M.S.	UNI	2003-2005	Committee member
Paula Even	M.S.	UNI	2003-2005	Committee member
Jihyo Chong	M.S.	UNI	2003-2006	Committee member
Nate Green	M.S.	UNI	2004-2005	Committee member
Sushil Gautam	M.S.	UNI	2005-2007	Committee member
Keshab Simkhada	M.S.	UNI	2006-2007	Committee member
Brittany Flokstra	Ph.D.	U.Iowa	2009	Committee member
Yogendra Khadka	M.S.	UNI	2008-2012	Committee member
Sujan Rai	M.S.	UNI	2008-2012	Committee member
Mark Wilcox	DIT	UNI	2010-2014	Committee member
Annette Fischels	M.S.	UNI	2010-present	Committee member
Molly Schlumbohm	M.S.	UNI	2011-present	Committee member
Jim Elric	M.S.	UNI	2011-2012	Committee member
Jennifer Rupp	M.S.	UNI	2012-2015	Committee member
Jacob Donaghy	M.S.	UNI	2012-2014	Committee member
Jennifer Shepeck	M.S.	UNI	2012-2014	Committee member
Junu Shrestha	M.S.	UNI	2012-2013	Committee member
Sushil Tuladhar	M.S.	UNI	2012-2013	Committee member
Md Aminul Haque	M.S.	UNI	2012-2013	Committee member
Ryan Kurtz	M.S.	UNI	2012-2014	Committee member
Anna (Brigid) Wieman	M.S.	UNI	2012-present	Committee member

Aaron Padilla	M.S.	UNI	2016-2018	Committee member
Chris Barber	M.S.	UNI	2018	Committee member
Jennifer Wittenburg	M.S.	UNI	2018	Committee member

Undergraduate Student Research Supervision

Heather Dworak	Summer Research/ Senior Honors Thesis	WHOI Rutgers	1994	Co-advisor (with Judy McDowell)
B.J. Barns	Summer Research	UNI	1999	Major advisor
Karly Wortmann	Summer Research	UNI	1999	Major advisor
Amanda Troester	Summer Research	UNI	2000	Major advisor
Chris Stokes	Summer Research	UNI	2000	Major advisor
Eric Tysland	Summer Research	UNI	2000	Co-advisor (with Ed Brown)
Leah Osterhaus	Summer Research	UNI	2000	Co-advisor (with Ed Brown)
Sarah Wickman	Summer Research	UNI	2001	Major advisor
Matt Hoffert	Summer Research	UNI	2002	Co-advisor (with Ed Brown)
Kerry Bohl	Summer Research	UNI	2002	Major advisor
Matt Hoffert	Summer Research	UNI	2003-2004	Major advisor
Jeff Baxter	Summer Research	UNI	2004-2005	Major advisor
Tyler Griffin	Summer Research	UNI	2004-2005	Major advisor
Jeremy Hammen	Summer Research	UNI	2004-2005	Major advisor
Jen Rouse	Summer Research	UNI	2004-2005	Major advisor
Amber Howe	Research	UNI	2006-2007	Co-advisor (w/ P. Berendzen)
Susan Meerdink	Research/Honors	UNI	2008-present	Major advisor
Ann Schwemm	Honors Thesis	UNI	2005	Committee member
Erin Powell	Honors Thesis	UNI	2005-2006	Committee member
Emma Congalton	Summer Research	UNI	2012	Co-advisor (NSF REU)
Madeleine Ball	Summer Research	UNI	2013	Co-advisor (NSF REU)
Almaris Figueroa	Summer Research	UNI	2014	Co-advisor (NSF REU)
Joshua Lockwood	Summer Research	UNI	2014	Co-advisor (NSF REU)
Tyler Light	Summer Research	UNI	2014	Co-advisor (NSF REU)
Darimar Dávila Ortiz	Summer Research	UNI	2017	Advisor (NSF REU)

External Research Funding

Co-Principal Investigator (with Bill Stigliani): "An Iowa Undergraduate Interdisciplinary Research Program: Protecting Water Quality in Iowa Lakes and Wetlands"

Roy J. Carver Trust	\$ 136,000	1999-2000
Iowa Space Grant Consortium	\$ 35,000	1999-2001

Co-Principal Investigator (with Bill Stigliani): "An Iowa Undergraduate Interdisciplinary Research Program: Protecting Water Quality in Iowa Lakes and Wetlands (Phase 2)"

Roy J. Carver Trust	\$ 186,412	2000-2001
Iowa Space Grant Consortium	\$ 22,000	2000-2002

Co-Principal Investigator (with Bill Stigliani): "An Iowa Undergraduate Interdisciplinary Research Program: Protecting Water Quality in Iowa Lakes and Wetlands (Phase 3)"

Roy J. Carver Trust	\$ 193,000	2002-2004
Iowa Space Grant Consortium	\$ 14,000	2003-2004

Principal Investigator: "Microcystin-LR: a potential contaminant of concern for Iowa surface waters"

Iowa State Water Resources Research Institute	\$ 16,246	2000-2001
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Principal Investigator: "An Investigation of the Proteotoxicity of Pesticides to *Chironomus tentans*, a Model Non-Target Species"

Applied Technology Research (CNS)	\$ 43,955	2000-2002
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Co-Principal Investigator (with Leslie S. Jones): "Evaluating the Efficacy of a Novel Approach to the Teaching of the Theory of Evolution Utilizing Live Marine Invertebrates"		
Graduate College (UNI)	\$ 975	1999-2000
Co-Principal Investigator (with Ramanathan Sugumaran and Bill Stigliani): "Remote Sensing of Water Quality (UNI/KSC)"		
NASA (Workforce Development Program)	\$ 40,000	2004-2005
Co-Principal Investigator (with Ramanathan Sugumaran and Bill Stigliani): "Hyperspectral Remote Sensing Data and Geographical Information Systems (GIS) Tools to Assess Water Quality in Coastal Areas and Shallow Inland Lakes"		
Iowa Space Grant Consortium (Co-op Program)	\$ 90,000	2004-2007
Co-Principal Investigator (with Ellen Kabat Lensch and Kirk Laffin): "The Advanced Technology Environment and Energy Center: A Resource Center"		
NSF (ATE)	\$1,762,371	2007-2013
Co-Principal Investigator (with Ed Brown): "Anaerobic Nutrient Removal System"		
Grow Iowa Values Fund	\$ 10,000	2008
Co-Principal Investigator (with Ramanathan Sugumaran, Tim Kidd, Patrick Pease and Andrey Petrov): "Acquisition of a Hyperspectral Imaging System (HIS) for Multidisciplinary Research"		
NSF (MRI)	\$ 167,950	2010-2012
Co-Principal Investigator (with Julie Kang, Darrell Wiens, Theresa Spradling, Kavita Dhanwada, John Ophus and David Saunders): "Microscopy and Image Analysis Facility"		
Roy J. Carver Charitable Trust	\$358,502	2012
Co-Principal Investigator (with Kavita Dhanwada, James Jurgenson, David McClenahan, Mary McDade, John Ophus, David Saunders, Carl Thurman, Michael Walter and Darrell Wiens): "Modernization of Teaching Laboratories for Students Pursuing Health Professions"		
Roy J. Carver Charitable Trust	\$218,233	2012
Co-Principal Investigator (with Peter Berendzen, Jim Demastes, Laura Jackson, Julie Kang, Mark Myers, Steve O'Kane, John Ophus, Kurt Pontasch, David Saunders, Mark Sherrard and Jeff Tamplin): "Modernization of Teaching Laboratories for Data Acquisition and Analysis"		
Roy J. Carver Charitable Trust	\$149,478	2013-2014
Co-Principal Investigator (with Bingqing Liang, Andrey Petrov, James Dietrich and Mark Sherrard): "Acquisition of a Hyperspectral Field Spectroradiometer to Enable Interdisciplinary Research"		
NSF MRI	\$ 77,601	2018-2019
Co-Principal Investigator (with Tilahun Abebe, Pete Berendzen, Jerreme Jackson and Theresa Spradling): "Enhancing Hands-on Training in Genetics and Genomics"		
Roy J. Carver Charitable Trust	\$200,000	2019-2020
UNI match	\$ 39,825	2019-2020

Professional Associations

American Chemical Society (ACS)
Association for the Sciences of Limnology and Oceanography (ASLO)
Sigma Xi
Society of Environmental Toxicology and Chemistry (SETAC)
Council of Colleges of Arts and Sciences (CCAS)

Presentations at National and International Meetings

Clayton, M.E. 1994. Isolation of a lipoprotein from the soft shell clam, *Mya arenaria*. Poster presentation at the 15th Annual Meeting of the Society of Environmental Toxicology and Chemistry.

Clayton, M.E., H.A. Dworak* and J.E. McDowell. 1995. Hsp 70 in the soft shell clam (*Mya arenaria*): potential as a biomarker of field contamination. *American Zoologist* 35(5):116A. Poster presentation at the Society of Integrative and Comparative Biology meeting.

This abstract was also presented at the Second SETAC World Congress, November 1995.

Clayton, M.E., R. Steinmann* and K. Fent. 1999. Different expression patterns of heat shock proteins hsp 60 and hsp 70 in zebra mussels (*Dreissena polymorpha*) exposed to copper and tributyltin. Platform presentation at the SETAC 20th Annual Meeting.

Clayton, M.E., D.E. Bartak and W.M. Stigliani. 2000. UNI Lake Water Quality Study: A Model Interdisciplinary Undergraduate Research Program. Poster presentation at the Council on Undergraduate Research 8th National Conference.

Jones, L.S., D.A. Anderson, P.E. Anderson and M.E. Clayton. 2001. The Evolution of the Teaching of Evolution. Oral presentation at the National Association for Research in Science Teaching Annual Meeting.

Anderson, P.E., M.E. Clayton, L.S. Jones and D.A. Anderson. 2001. How to Use Your Local "U". Oral presentation at the National Science Teachers Association National Annual Meeting.

Iqbal, M.Z., E.J. Brown and M.E. Clayton. 2002. Mapping of phosphorus in the sediments of a eutrophic lake in Iowa. Oral presentation at the Forty-seventh Annual Midwest Ground Water Conference.

Tsamis, E.*, L. Wright, J. Bumpus, S. Liegois*, W.M. Stigliani, M.E. Clayton, S. Wickman*, E.J. Brown, H. Wood* and R. Burk*. 2003. Water Quality of Iowa's Lakes and Rivers. Poster presentation at the American Chemical Society National Meeting.

Dhanwada, K.R., J.J. Becker* and M.E. Clayton. 2004. Effects of Atrazine and Metabolites on the Proliferation of Human Fibroblasts. Poster presentation at the Society of Environmental Toxicology and Chemistry Annual Meeting.

M.E. Clayton, K.R. Dhanwada and Y. Deng**. 2004. Effects of Atrazine, Metolachlor and Diazinon Alone or in Binary Mixtures on Human Fibroblast Proliferation. Poster presentation at the Society of Environmental Toxicology and Chemistry Annual Meeting.

Sandersfeld*, L., E. Pasco**, M.E. Clayton and E.J. Brown. 2007. Biologically-enhanced sequestration of phosphate in iron-enriched sediments. Oral presentation at the American Chemical Society National Meeting.

Iqbal, M.Z. and M.E. Clayton. 2011. Developing short duration field activities for undergraduate students in hydrologic sciences. Presentation at the Geological Society of America regional meeting in Pittsburgh, PA.

Figueroa*, A., M.E. Clayton and J.M. Egenhoff*. 2015. Using the FieldSpec® 3 and the Olympus CH30 microscope to create a spectral library of different human cancer cells. Oral presentation at the Association of American Geographers meeting in Chicago, IL.

Dávila Ortiz*, D. and M.E. Clayton. 2018. Identifying plastic microfibers in the marine environment using hyperspectral imaging. Poster presentation at the Association of American Geographers meeting in New Orleans, LA.

* indicates undergraduate student co-author, ** indicates graduate student co-author

Presentations at Local and Regional Meetings

Pircher, E.** and M.E. Clayton. November 2000. Toxic and biological effects of a mixture of heavy metals in chironomid larvae. VII Annual BBMB Symposium, Iowa State University, Ames, IA.

Clayton, M.E. and W.M. Stigliani. December 2000. UNI Lake Water Quality Project. Iowa Space Grant Consortium Annual Meeting.

Schultz, A.C.**, L.C. Osterhaus*, E.J. Brown and M.E. Clayton. March 2001. Microcystin-LR: A Potential Contaminant of Concern for Surface Water Quality in Iowa. Agriculture and the Environment: State and Federal Water Initiatives, Ames, IA.

Osterhaus, L.C.* , M.E. Clayton and W.M. Stigliani. March 2001. University of Northern Iowa: Iowa Lakes Project. Agriculture and the Environment: State and Federal Water Initiatives, Ames, IA.

Troester, A.* , K. Wortmann* and M.E. Clayton. April 2001. Phytoplankton Abundance and Nutrient Concentrations in Two Small Iowa Lakes. UNI Sigma Xi Student Research Conference.

Osterhaus, L.C.* , M.E. Clayton and W.M. Stigliani. April 2001. University of Northern Iowa: Iowa Lakes Project. UNI Sigma Xi Student Research Conference.

Schultz, A.C.**, L.C. Osterhaus*, E.J. Brown and M.E. Clayton. April 2001. Microcystin-LR: A Potential Contaminant of Concern for Surface Water Quality in Iowa. UNI Sigma Xi Student Research Conference.

Pircher, E.** and M.E. Clayton. April 2001. Toxic and biological effects of a mixture of heavy metals in chironomid larvae. UNI Sigma Xi Student Research Conference.

Henkle. H.* , M.E. Clayton and W.M. Stigliani. November 2001. The Effects of Land Use on Surface Water Quality . Invited presentation at the Regional Iowa Space Grant Consortium Conference, Chicago. Clayton, M.E. and W.M. Stigliani. December 2001. The Effects of Land Use on Surface Water Quality in Iowa. Iowa Space Grant Consortium Conference.

Henkle. H.* , M.E. Clayton and W.M. Stigliani. April 2002. The Effects of Land Use on Surface Water Quality . Iowa Academy of Science Conference, DesMoines.

Wickman, S.* and M.E. Clayton. April 2002. Temporal Analysis of Phosphorus in Two Iowa Lakes. UNI Sigma Xi Student Research Conference.

Bohl, K.* , B. Barry*, M. Hoffert*, E. Tsamis*, J. Bumpus, E.J. Brown and M.E. Clayton. August 2002. Nutrients and Phytoplankton in Iowa Lakes and Wetlands. UNI Student Undergraduate Research Conference.

Hoffert, M.* , K. Bohl*, E.J. Brown and M.E. Clayton. August 2002. Is Silver Lake Toxic? UNI Student Undergraduate Research Conference.

Becker, J.* , D. Bartak, M.E. Clayton and K.R. Dhanwada. August 2003. The Effects of Atrazine and its Metabolites on Human Cell Growth from Pesticide Contaminated Iowa Water Sources. UNI Student Undergraduate Research Conference.

Hoffert, M.* and M.E. Clayton. August 2003. Eutrophication in Iowa Lakes and Wetlands. UNI Student Undergraduate Research Conference.

Appletoft, C.* , K. Johnston*, A. Schwemm*, E.J. Brown and M.E. Clayton. August 2004. Identification of the source of *E. coli* in Wyth Lake. UNI Student Undergraduate Research Conference.

Baxter, J.* , T. Griffin*, J. Hammen*, J. Rouse*, and M.E. Clayton. August 2004. Ground Truthing for Calibration of Remote Sensing Water Quality Data. UNI Student Undergraduate Research Conference.

Also presented at Midwest Regional Space Grant meeting, Sigma Xi Student Research Conference.

Rouse, J.*, J. Hammen*, T. Griffin*, J. Baxter*, and M.E. Clayton. August 2004. Water Quality Trends in Two Iowa Lakes. UNI Student Undergraduate Research Conference. Also presented at Sigma Xi Student Research Conference.

Sugumaran, R., M.E. Clayton, N.R. Green**, and M.A. Voss*. August 2004. Water Quality Analysis using Hyperspectral Remote Sensing Data in Iowa Inland Lakes. UNI Student Undergraduate Research Conference. Also presented at Midwest Regional Space Grant meeting.

Sandersfeld, L.*, M.E. Clayton and E.J. Brown. March 2007. A novel method to reduce phosphorus pollution in Iowa waters. Poster presentation at the Research at the Capitol – Undergraduate Research Forum. Des Moines, IA.

Adegboyega, N.F.**, M.E. Clayton and E.J. Brown. October 2009. Pollution swapping: The effect of phosphorus sequestration on denitrification in wetland sediments. Poster presentation at the ACS Midwest Regional Meeting. Iowa City, IA.

* indicates undergraduate student co-author, ** indicates graduate student co-author

Courses Taught

820:140	Environment, Technology and Society
830:200	Environmental Biology
830:289	Environmental Science/Technology Seminar
830:292	Environmental Analysis
840:051	General Biology I (now BIOL 2051 General Biology: Organismal Diversity; Lab and Lecture)
840:112	Invertebrate Zoology (now BIOL 3112)
840:159	Marine Ecology of the Western Gulf of Mexico
840:202	Biology Graduate Colloquium
BIOL 3159	Marine Biology
BIOL 1012	Life: Natural World (regular and honors sections)
BIOL 3174	Field Biology (Study Abroad: Research in Taiwan)
BIOL 3174	Field Biology (Study Abroad: Research in Galapagos)

Committee Memberships

Outstanding Master's Thesis Award Committee	1998
Wildlife Zoologist Search Committee	1999 – 2000
Capstone Coordinating Committee	1999 – 2002
Biology Graduate Committee	2000 – 2003, 2004-2007
Environmental Biologist Search Committee	2001
Ecologist Search Committee	2005
Graduate Program Quality Task Force	2007-2008
Biology SMT Scholarship Committee	2007-2016
Biology Department Scholarship Committee	2008-2016
Biology Department SubPAC (chair 2014-2015)	2008-2011, 2013-2015
Graduate Council (<i>ad hoc</i> voting member; chair)	2008-2010; 2010-2016
Academic Program Assessment (TF2)	2009
Associate Provost and Graduate Dean Search Committee	2010
Graduate College Strategic Planning Committee	2010-2011
Five Year Review Committee for President Allen	2011-2012
Water Resources Coordinating Council (State of Iowa)	2011-present
Ecosystem Ecologist Search Committee (chair)	2012
Five Year Review Committee for Provost Gibson	2013-2014
Air Quality/Meteorology Search Committee	2013-2014
Water Quality Initiative Proposal Review (State of Iowa)	2013-present

Center for Social and Behavioral Research Director Search	2014
Academic Master Plan Steering Committee	2014-present
Outstanding Doctoral Dissertation Award Committee	2015
Assessment Council	2016-present
Program Vitality Committee	2017-present
Electronic Faculty Activity Report Committee	2017-present
Educator Preparation Executive Council	2017-present
Recruitment Council	2017-2019
Iowa Nutrient Research Center Advisory Committee	2017-present
Educator Preparation Content Study Committee	2019-present