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Education

Ph.D. Marine Bioscience, University of Delaware, 2014.

M.S. Biology, University of West Florida, 2008.

B.S. Marine Biology, University of West Florida, 2002.

Employment and Research Experience

Environmental Scientist/Chief of Operations, DNREC. 2018 - Present.

Analytical Chemist, Department of Natural Resources and Environmental Control. 2016 - 2018.

Postdoctoral Researcher, University of Delaware. 2014 - 2015.

Graduate Student, University of Delaware. 2010 - 2014.

Adjunct Professor, University of West Florida. 2009 - 2010.

Teacher, Gulf Breeze High School. 2008 - 2009.

Professional Publications and Presentations:

Publications

Main, Christopher R., Hanes, J.D., Andres, A.S., Ullman, W.J. Rates of net primary production from continuous high-frequency monitoring of Coursey Pond, Delaware (*In Prep*)

Li, Q., Yuan, H., **Main, C.R.**, Anton, J., Jaisi, D. Tracing the sources of phosphorus in the Love Creek Watershed, Delaware. *Science of the Total Environment*. (*In Review*)

Coyne, K.J., Salvitti, L.R., Mangum, A.M., Ozbay, G., **Main, C.R.**, Kouhanestani, Z.M., Warner, M.E. Resource acquisition strategies by the mixotrophic dinoflagellate, *Karlodinium veneficum*, in response to climate change conditions. *PLoS One*. (*In Review*)

Main, Christopher R., Tyler, R., Huerta, S. Microbial Source Tracking in the Love Creek Watershed, Delaware (USA). *Delaware Journal of Public Health*. 2021. 01:06. DOI: [10.32481/djph.2021.01.006](https://doi.org/10.32481/djph.2021.01.006)

Andres, A.S., **Main, C.R.**, Pettay, D.T., Ullman, W.J., Hydrophysical and Hydrochemical Controls of Cyanobacterial Blooms in Coursey Pond, Delaware (USA). *Journal of Environmental Quality*. 2019. J. Environ. Qual. 48:73-82. DOI: [10.2134/jeq2018.03.0108](https://doi.org/10.2134/jeq2018.03.0108)

Main, Christopher R., Greenfield, D.I., Doll, C., Wang, Y., Whereat, E.B., Mortensen, R., Pettay, D.T., Coyne, K.J. Critical comparison of molecular methods for detection and enumeration of the harmful algal species, *Heterosigma akashiwo*, in environmental samples. *Journal of Applied Phycology*. 2018. 30:2425. DOI: [10.1007/s10811-018-1444-z](https://doi.org/10.1007/s10811-018-1444-z)

Gonski, Stephen F., Cai, WJ, Ullman, W.J., Joesoef, A., **Main, C.R.**, Pettay, D.T., Martz, T.R. Assessment of the suitability of Durafet-based sensors for pH measurement in dynamic estuarine environments. *Estuarine, Coastal and Shelf Science*. 2018. 200:152-168. DOI: [10.1016/j.ecss.2017.10.020](https://doi.org/10.1016/j.ecss.2017.10.020)

Main, Christopher R., Salvitti, L.R., Whereat, E. Coyne, K.J. 2015. Community-level and species-specific associations between phytoplankton and particle-attached *Vibrio* species in Delaware's inland bays. *Applied and Environmental Microbiology*. 2015. 81:5703-5713 DOI: [10.1128/AEM.00580-15](https://doi.org/10.1128/AEM.00580-15)

Main Christopher R., Doll, C., Bianco, C., Coyne, K.J., Greenfield, D.I. Comparison of algal growth phase, macronutrient and light limitation for the quantification of *Heterosigma akashiwo* (Raphidophyceae) using quantitative real-time PCR (qPCR) and sandwich hybridization assay (SHA). *Harmful Algae*. 2014. 37:92-99. DOI: [10.1016/j.hal.2014.05.014](https://doi.org/10.1016/j.hal.2014.05.014).

Doll, C., **Main C.R.**, Bianco, C., Coyne, K.J., Greenfield, D.I. Comparison of sandwich hybridization assay (SHA) and quantitative PCR (QPCR) for the detection and quantification of live and preserved samples of the harmful alga *Heterosigma akashiwo* (Raphidophyceae). *Limnology and Oceanography: Methods*. 2014. 12:232-245. DOI: [10.4319/lom.2014.12.232](https://doi.org/10.4319/lom.2014.12.232)

Presentations

Talks (*Presenter)

Main, Christopher R.*, Tyler, R.M., Huerta, S. Bates, N.S, Andres, A.S. Microbial Source Tracking in the Love Creek Watershed of Delaware's inland bays. Association of Mid-Atlantic Aquatic Biologists Workshop, Berkeley Springs, WV. 2018.

Greenfield, Dianne I.*, Coyne, K.J., Doll, C., **Main, C.R.** The effects of cell physiology on Sandwich Hybridization Assay and Quantitative PCR results for the harmful alga, *Heterosigma akashiwo*. Aquatic Sciences Meeting. Granda, Spain. 2015.

Main, Christopher R.*, Coyne, K.J. The *Vibrio*-HAB Connection: Investigating Interactions between *Vibrio* and *Heterosigma akashiwo*. Joint Aquatic Sciences Meeting, Portland, OR. 2014.

Coyne, Kathryn J.*, **Main, C.R.**, Doll, C., Bianco, C., Greenfield, D.I. Effects of growth phase, diel cycle and macronutrient stress on the quantification of *Heterosigma akashiwo* using qPCR and SHA. 7th Symposium on Harmful Algae in the US, Sarasota, FL. 2013.

Greenfield, Dianne I.*, Coyne, K.J., Doll, C., **Main C.R.**, Bianco, C. Comparison of Sandwich Hybridization Assay and Quantitative PCR for HAB Research and Management using the Raphidophyte *Heterosigma akashiwo*. ASLO Aquatic Sciences Meeting, New Orleans, LA. 2013.

Main, Christopher R.*, Salvitti, L.R., Whereat, E., Farestad, M., Coyne, K.J. Investigating Associations between Harmful Algal Bloom Species and *Vibrio* in the Delaware Inland Bays. 15th International Conference on Harmful Algae, Gyeongnam, Republic of Korea. 2012.

Greenfield, Dianne I.*, Coyne, K.J., Doll, C., **Main C.R.**, Bianco, C. Comparative Analyses Of Sandwich Hybridization Assay And Quantitative PCR For The Harmful Raphidophyte *Heterosigma akashiwo*. 15th International Conference on Harmful Algae, Gyeongnam, Republic of Korea. 2012.

Poster (*Presenter)

Andres, Scott*, Ullman, W., **Main, C.R.**, Pettay T. Biogeochemical responses of a Coastal Plain pond to hydrologic and nutrient loading variability – implications for long-term management and mitigation. American Geophysical Union Fall Meeting, Washington, D.C. 2018.

Coyne, Kathryn J.*, **Main, C.R.**, Doll, C., Wang, Y., Whereat, E., Pettay T., and Greenfield D.I. Comparison between quantitative real time PCR (qPCR) and sandwich hybridization assay (SHA) for the detection and quantification of *Heterosigma akashiwo* in field samples. 9th Symposium on Harmful Algae in the US, Baltimore, MD. 2017.

Andres, Scott*, Voynova, Y., **Main, C.R.**, Pettay T., Ullman, W. Meteorological forcing of the biogeochemistry of the Muderkill River and Estuary, Delaware USA. AGU Chapman Conference on Extreme Climate Event Impacts on Aquatic Biogeochemical Cycles and Fluxes, San Juan, Puerto Rico. 2017.

Andres, Scott*, Ullman, W., **Main, C.R.**, Hanes, J.D. Role of Coastal Plain Millponds in Mitigating Groundwater-delivered Nutrient Loads. Geological Society of America, Denver, CO. 2016.

Gonski, Stephen*, Huang, W-J, Hussain, N., Ullman, W., **Main, C.R.**, Wirth, T.S., Joesoef, A., Collins, A., O'Neill, M., Cai, W-J (2015) Emerging Applications of Durafet-based pH Sensors in Estuarine and Coastal Environments. Chemical Oceanography Gordon Research Conference. Holderness, NH. 2015.

Greenfield, Diane I., Coyne, K.J.*, Doll, C., Bianco, C., **Main, C.R.** Comparative analyses of Sandwich Hybridization Assay and Quantitative PCR for *Heterosigma akashiwo*: Applications to field sampling and management. 16th International Conference on Harmful Algae, Wellington, New Zealand. 2014.

Coyne, Kathryn J.*, Greenfield, D.I., **Main, C.R.**, Doll, C., Effects of physiological status on the quantification of *Heterosigma akashiwo* using Quantitative Real Time PCR (qPCR) and Sandwich Hybridization Assay (SHA). 16th International Conference on Harmful Algae, Wellington, New Zealand. 2014.

Main, Christopher R.*, Coyne, K.J. The *Vibrio*-HAB Connection: Investigating the Influence of Iron on formation of *Vibrio* Biofilms and ROS production by *Heterosigma akashiwo*. 7th Symposium on Harmful Algae in the US, Sarasota, FL. 2013.

Coyne, Kathryn J.*, **Main, C.R.**, Bouchard, J.N., Polson, S.W., Warner, M.E., Transcriptome Profiling of *Heterosigma akashiwo*: Regulation of Gene Expression by Light and Nitrogen Source. 15th International Conference on Harmful Algae, Gyeongnam, Republic of Korea. 2012.

Main, Christopher R.*, Coyne, K.J. The *Vibrio* HABs Connection: Investigating Interactions between Harmful Algal Bloom Species and Pathogenic *Vibrio*. 6th Symposium on Harmful Algae in the US Austin, TX. 2011.

Doll, Cameron*, Greenfield, D., **Main, C.R.**, Coyne, K. J. Determining Factors that Influence Molecular Quantification of the Harmful Raphidophyte *Heterosigma akashiwo* using Sandwich Hybridization Assay (SHA). 6th Symposium on Harmful Algae in the US, Austin, TX. 2011.

Invited Talks

Microbial Source Tracking in the Love Creek Watershed of Delaware's inland bays. Center for the Inland Bays Science and Technical Advisory Committee. 2017.

Investigating Associations between Harmful Algal Bloom Species and *Vibrio* in Delaware's inland bays. Dover Kiwanis Club. June 2015.

The Land Ocean Biogeochemical Observatory (LOBO) in the Murderkill River Estuary. Dover Kiwanis Club. June 2015.

Teaching

Univeristy of West Florida

MCB 1000L	Fundamentals of Microbiology Lab	BOT 4374L	Plant Development Lab
ZOO 1010L	General Zoology Lab	BOT 4503L	Plant Physiology Lab
BOT 2010L	General Botany Lab	BOT 4734L	Plant Biotechnology Lab
BOT 4404L	Aquatic Botany Lab	PCB 4043L	Ecology Lab
BOT 4406/L	Marine Algae Lecture and Lab		

Gulf Breeze High School

Marine Science	10 - 12th Grades
General Biology	10th Grade

Committees:

Monitoring subcommittee of the Science and Technical Advisory Committee for the Center for the Inland Bays. Chair. 2018 - 2019.