

# Laura Beecraft

Harte Research Institute for Gulf of Mexico Studies  
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## Education

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**Doctor of Philosophy, Biology** 2018  
Department of Biology, University of Waterloo, Waterloo ON  
**Bachelor of Science, Honours Biology** 2011  
University of Waterloo, Waterloo ON

## Research Appointments

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**Assistant Research Scientist**, Coastal Ecosystem Processes

Supervisor: Dr. Michael S. Wetz

Harte Research Institute for Gulf of Mexico Studies,

Texas A&M University-Corpus Christi, Corpus Christi TX

July 2023 – present

- Leadership role in research project “Assessing the risk to ecosystem health from increasing nitrogen and phosphorus levels in Lavaca Bay” (awarded to Michael S. Wetz, \$454,162 May 2023-April 2026), including coordination of field work and sample collection and analysis of phytoplankton samples
- Analysis and communication of research results (U.S. Symposium on Harmful Algae; Coastal and Estuarine Research Federation Conference)
- Leadership role in the implementation and operation of HAB monitoring and water quality programs (San Antonio and Matagorda Bay) with a focus on development of Imaging Flow Cytobot (IFCB) deployment and post-processing infrastructure
- Mentoring of undergraduate and graduate students, experiment and instrument protocol development and training
- Community and stakeholder engagement: TAMU-CC Collegiate STEM Institute student visit (July 26, 2023)

**Post-doctoral Research Associate**, Coastal Ecosystem Processes

Supervisor: Dr. Michael S. Wetz

Harte Research Institute for Gulf of Mexico Studies,

Texas A&M University-Corpus Christi, Corpus Christi TX

June 2021 – June 2023

- Applied research focusing on monitoring and understanding nutrient pollution, coastal phytoplankton dynamics and drivers of harmful algal blooms to support informed water quality management efforts in Texas estuaries

- Implementation of a harmful algal bloom monitoring program in Matagorda Bay and San Antonio Bay (TX) involving operation and training of an imaging flow cytometer (IFCB) and identification and quantification of phytoplankton using microscopy and flow cytometry
- Communication of research to scientific (Chin et al., 2022; Beecraft & Wetz, 2022) and general (Wetz et al., submitted; Quigg et al. submitted) audiences, including analysis and visualization of large data sets (R)
- Co-authored funding proposal to Matagorda Bay Mitigation Trust “Assessing the risk to ecosystem health from increasing nitrogen and phosphorus levels in Lavaca Bay” (awarded to Michael S. Wetz, \$454,162) May 2023-April 2026
- Community and stakeholder engagement of research: “Assessing the risk to ecosystem health from nutrient pollution in Lavaca Bay” Lavaca Bay Foundation speaker series (June 15, 2023)

**Post-doctoral Researcher**, Wetland Ecology

May 2018 – May 2021

Supervisor: Dr. Rebecca C. Rooney

University of Waterloo, Waterloo ON

- Designed and conducted experiments to assess natural and human influences on components of wetland function, specifically the effects of acute and chronic herbicide exposure on periphytic biofilm communities
- Key outcomes include the measurement of bioconcentration of glyphosate in periphyton at orders of magnitude higher than ambient water conditions, presenting an exposure route not assessed when considering glyphosate toxicity in aquatic systems
- Organized and led team field work in wetland and tributary environments accessed by boat in Lake Erie provincial parks
- Mentoring and training of field and laboratory technicians, graduate students and volunteers
- Designed and constructed a laboratory growth system/microcosm facility for experimental manipulation of periphytic biofilm communities
- Sample collection and laboratory preparation of periphyton for collaborations examining herbicide effects on (1) essential fatty acid content in periphyton (M. Arts, Ryerson University) and (2) periphyton as a food source for gastropods (R. Prosser, University of Guelph) and fish (D. Orihel, Queen’s University)
- Data management, univariate and multivariate analysis (Excel, R, PCOrd), report and manuscript development

**Doctoral Researcher**, Aquatic Ecology Lab

Supervisor: Dr. Ralph E.H. Smith,

University of Waterloo, Waterloo ON

September 2011 – April 2018

- Thesis: “Solar radiation effects and ecophysiology of Great Lakes phytoplankton: insights from spectral fluorescence of chlorophyll *a*” (program transfer from MSc to PhD May 2013), nominated for W.B. Pearson Medal

- Assessed ultraviolet radiation sensitivity of natural and laboratory phytoplankton using variable fluorometry (Phyto-PAM) and carbon-14 uptake, and application of kinetic models, regression and univariate analyses (Excel, Systat 10 and R)
- Evaluated spectral fluorometry techniques (Phyto-PAM, Fluoroprobe) to assess phytoplankton group classification, with applications to monitoring of water quality and community dynamics
- Key outcomes include (1) evidence that innate resistance of Photosystem II to high light and ultraviolet radiation stress is not a contributing factor in dominance of cyanobacterial blooms in freshwaters, and (2) quantified levels of uncertainty in group composition estimates by spectral fluorescence over a range of scenarios
- Identified and quantified freshwater phytoplankton (Laurentian Great Lakes) by light microscopy and fluorometric analysis of extracted chlorophyll *a*
- Maintenance of microalgae and cyanobacteria culture collection (batch culture)

### Research Assistant, Aquatic Ecology Lab

University of Waterloo, Waterloo ON

May 2011 – August 2011

- Phytoplankton and water quality sampling aboard large vessel cruises of the Great Lakes in collaboration with Dr. S. Watson at Environment and Climate Change Canada, ECCC) as assistant to a graduate research project
- Performed nutrient deficiency assays to analyze phytoplankton nutrient status in Lake Erie
- Designed and conducted preliminary testing of alkaline phosphatase activity assay for phytoplankton nutrient (phosphorus) status

## Contributions

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### *Peer Reviewed Publications*

1. **Beecraft L. & Wetz M.S.** (2022) Temporal variability in water quality and phytoplankton biomass in a low-inflow estuary (Baffin Bay, Texas). *Estuaries and Coasts* SI: Ecology, Stressors, and Management of Low Inflow Estuaries. DOI: 10.1007/s12237-022-01145-y
2. Chin T., **Beecraft L.**, Wetz M.S. (2022) Phytoplankton biomass and community composition in three Texas estuaries differing in freshwater inflow regime. *Estuarine, Coastal and Shelf Science*, 277, 108059. DOI: 10.1016/j.ecss.2022.108059
3. **Beecraft L.**, Watson S.B. & Smith R.E.H. (2021) Quantifying the uncertainties in multi-wavelength PAM fluorometry due to innate and irradiance-induced variability of fluorescence spectra. *Aquatic Ecology*, 55(1), 169-186. DOI: 10.1007/s10452-020-09821-6
4. **Beecraft L.**, & Rooney R.C. (2021) Bioconcentration of glyphosate in wetland biofilms. *Science of the Total Environment* 756:143993. DOI: 10.1016/j.scitotenv.2020.143993
5. **Beecraft L.**, Watson S.B. & Smith R.E.H. (2019) Innate resistance of PSII efficiency to sunlight stress is not an advantage for cyanobacteria compared to eukaryotic phytoplankton. *Aquatic Ecology*, 53(3), 347-364. DOI: 10.1007/s10452-019-09694-4

6. Harrison, J.W., **Beecraft, L.** & Smith R.E.H. (2018) Implications of irradiance exposure and non-photochemical quenching for multi-wavelength (bbe Fluoroprobe) fluorometry. *J. Photochem. Photobiol-B* 189: 36-48. DOI: 10.1016/j.jphotobiol.2018.09.013
7. **Beecraft L.**, Watson S.B. & Smith R.E.H. (2017) Multi-wavelength Pulse Amplitude Modulated fluorometry (Phyto-PAM) reveals differential effects of ultraviolet radiation on the photosynthetic physiology of phytoplankton pigment groups. *Freshwater Biology*, 62(1): 72-86. DOI: 10.1111/fwb.12850

### *Book Chapters*

1. Wetz M.S., **Beecraft L.**, McBride M., Steichen J.L. & Quigg A. (submitted) Nutrient-Phytoplankton Dynamics in Texas Estuaries in Montagna PA, Douglas AR (eds.) *Freshwater Inflows to Texas Bays and Estuaries: A Regional-Scale Review, Synthesis, and Recommendations*. Springer Nature, Cham, Switzerland (submitted)
2. Quigg A., Steichen J.L., **Beecraft L.**, & Wetz M.S. (submitted) Plankton Dynamics in Texas Estuaries in Montagna PA, Douglas AR (eds.) *Freshwater Inflows to Texas Bays and Estuaries: A Regional-Scale Review, Synthesis, and Recommendations*. Springer Nature, Cham, Switzerland (submitted)

### *National and International Conference Presentations*

(\* indicates student presenter)

1. Beecraft L., Burch D., Hayes K.C. & Wetz M.S (2023) High-resolution sampling of water quality & phytoplankton dynamics in two shallow Texas estuaries. 27th Biennial Coastal and Estuarine Research Federation Conference, Portland OR.
2. Rooney R., Beecraft L., Izma G., McNamee R. & Montreuil Strub E. (2023) Wetland biofilm - a key primary producer and agent of water purification. Presented at: International Association for Great Lakes Research 56<sup>th</sup> Annual Conference on Great Lakes Research, Toronto ON.
3. Beecraft L. & Wetz M.S. (2022) Episodic inflow and salinity changes produce distinct bloom communities in a low-inflow estuary (Baffin Bay, Texas). Lightning talk and poster presentation at U.S. Symposium on Harmful Algae, Albany NY.
4. Beecraft L. & Rooney R.C. (2020) Is periphyton filtering our wetlands? Lightning talk and poster presentation at: World Wetland Day Symposium, Waterloo ON.
5. \*Koiter L., Beecraft L., Lynch M., Charles T.C. & Rooney R.C. (2019) Periphyton community composition changes following glyphosate exposure. Canadian Society for Ecology and Evolution CSEE-ESC 2019 Joint Meeting. Fredericton, N.B.
6. Beecraft L., Watson S.B. & Smith R.E.H. (2016) Comparative irradiance responses among freshwater phytoplankton groups in culture and in natural communities. Presented at: Phycological Society of America Annual Meeting, Cleveland OH.
7. Beecraft L., Watson S.B. & Smith R.E.H. (2015) Application of Multi-wavelength variable fluorescence (Phyto-PAM) for assessment of community composition and sunlight sensitivity

in freshwater phytoplankton. Presented at: Association for the Sciences of Limnology and Oceanography 2015 Aquatic Sciences Meeting, Granada Spain.

8. Beecraft L., Watson S.B. & Smith R.E.H. (2013) Multi-wavelength fluorometric assessment (Phyto-PAM) of photosynthetic sensitivity to solar radiation stress in major phytoplankton groups. Presented at: International Association for Great Lakes Research 56<sup>th</sup> Annual Conference on Great Lakes Research, West Lafayette IN.
9. Beecraft L., Watson S.B. & Smith R.E.H. (2013) Selective impacts of irradiance stress on phytoplankton communities as assessed by multi-wavelength spectrally resolved Pulse Amplitude Modulated fluorometry (Phyto-PAM). Poster presentation at: 48<sup>th</sup> Central Canadian Symposium on Water Quality Research, Hamilton ON.

### *Local and Institutional Conferences and Seminars*

1. \*Urrutia, F., Manalilkada Sasidharan, S., Beecraft, L., Burch, D., Wetz, M.S. (2022) Variability in Phytoplankton Biomass on Daily Timescales Along an Estuary-Coast Continuum. Poster presentation at: Texas Bays & Estuaries Meeting. University of Texas Marine Science Institute, Port Aransas TX.
2. \*Weder J.S., Madison B.N., Rooney R.C., Beecraft L. & Orihel D.M. (2019) The effects of glyphosate on the nutritional quality of periphyton for grazing fish. Undergraduate Research Symposium. Queen's University, Kingston ON.
3. Beecraft L. (2015) 'Cyanoforecast': UV Index Moderate to High. Invited Speaker, Presented at: University of Waterloo Ecology Group Seminar Series, Waterloo ON.
4. Beecraft L. (2013) Selective impacts of irradiance stress on phytoplankton communities as assessed by multi-wavelength Pulse Amplitude Modulated fluorometry (Phyto-PAM). Presented at: University of Waterloo Graduate Student Research Conference, Waterloo ON. *Awarded Outstanding Graduate Student Seminar Award.*
5. Beecraft L. (2013) Using variable fluorescence to measure ultraviolet radiation stress in phytoplankton. Invited speaker, Presented at: Students of the Water Institute (Graduate Chapter) Seminar Series, Waterloo ON.

## Teaching and Mentorship

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### **Mentorship of graduate and undergraduate (UG) student research**

Coastal Ecosystem Processes Lab, M.S. Wetz, Harte Research Institute, Corpus Christi TX

- Graduate researchers: J. Cutajar, M. McBride (2021-2022); L. Barraza, S. Gonzalez (2023-present)
- UG Research Project: "Variability in Phytoplankton Biomass on Daily Timescales Along an Estuary-Coast Continuum", F. Urrutia 2022

Wetland Ecology Lab, R.C. Rooney, University of Waterloo, Waterloo ON

- MSc Project: “Metabolism of glyphosate by periphyton and the impact of glyphosate on periphyton community structure in freshwater ecosystems” 2018 - 2020

Aquatic Ecology Lab, R.E.H. Smith, University of Waterloo, Waterloo ON

- UG Research Project (Course code BIOL 499): “Using multi-wavelength chlorophyll-a fluorescence to detect harmful phytoplankton in freshwaters” 2016 –2017
- UG Research Project: “Induction and implications of colonial habit in *Microcystis*” 2012 –2013
- UG Research Project: “Phosphorus stress and ultraviolet radiation effects on eukaryotic and prokaryotic microalgae” 2011 –2012
- UG Research Project: “Morphology and Phosphorus stress in *Microcystis*” 2011 –2012

### Invited Lectures and Presentations

“Assessing the risk to ecosystem health from nutrient pollution in Lavaca Bay”. Lavaca Bay

Foundation Speaker Series. Port Lavaca, TX. June 15, 2023

“Periphyton in wetlands: A community within a community”. Applied Wetland Science (BIOL 462/Earth 444), University of Waterloo, Waterloo ON. October 7<sup>th</sup>, 2020

“Periphyton in shallow water systems: impacts of herbicide exposure”. Departmental Seminar, School of Environmental Studies. Queen’s University, Kingston ON. November 14<sup>th</sup> 2019

“Periphyton in Wetlands: Roles in ecological function and current research”. Applied Wetland Science (BIOL 462/Earth 444), University of Waterloo, Waterloo ON. October 4<sup>th</sup>, 2019

### Laboratory Teaching Assistant

Department of Biology, University of Waterloo, Waterloo ON 2011 – 2017

Prepared and presented weekly laboratory content, relevant theory and techniques (e.g. light microscopy, dissections, and sterile technique), supervised laboratory experiments, evaluated and provided feedback on scientific report writing and test material:

- Entry-level undergraduate courses: Introductory Zoology, Introduction to Plant Structure and Function, Introduction to the Microbial World, Fundamentals of Microbiology
- Upper-level undergraduate courses: Phycology, Virology, Flowering Plants

### Experienced teaching assistant volunteer, Biology TA Training Workshops

University of Waterloo, Waterloo, ON 2012-2016

- Preparation and presentation of workshop content as the TA Representative for the Biology Graduate Student Association, and co-organization of the workshop with department laboratory Instructors (2013, 2014)
- Lead group discussion and training scenarios of new department teaching assistants

## Service

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### Review of Scientific Manuscripts & Grant Applications

2019-present

- Environmental Toxicology & Chemistry
- Estuaries & Coasts
- Harmful Algae
- Chemosphere
- Biological Invasions
- Ecological Applications
- Frontiers in Microbiology
- Journal of Marine Science and Engineering
- European Journal of Phycology
- New Hampshire Sea Grant
- Mississippi Based RESTORE Act Center of Excellence (MBRACE)

### Teaching & Research

Judging student presentations (oral and poster), 27th Biennial Coastal and Estuarine Research Federation Conference, Portland OR, November 2023

Judging student poster presentations, Spring Student Research Symposium Texas A&M Corpus Christi, Corpus Christi TX, April 2022

### Invited Meetings and Symposia

Assessing and Enhancing the Resilience of Great Lakes Coastal Wetlands Expert Meeting, Environment and Climate Change Canada, Canada Centre for Inland Waters, Burlington ON

March 25-26, 2019

Visualizing an Updated Understanding of Lake Erie Eutrophication, University of Windsor, Windsor ON

March 12-13, 2019

### Canadian Student Representative, Board of Directors

International Association for Great Lakes Research (IAGLR), Ann Arbor MI

2015 – 2017

- Initiated and facilitated IAGLR becoming a member of the Consortium of Aquatic Science Societies (CASS)

Awards Committee Co-chair

- Scholarship and award promotion, design and draft awards promotional materials, primary contact during submission, judge solicitation and organization, awards promotion at annual conference, and submission and presentation of committee reports at bi-annual board meetings

Membership Committee

Communications & Outreach Committee, Awards Committee liaison

### Chair, Executive Council of the Biology Graduate Student Association

University of Waterloo, Waterloo ON

2015-2016

- Management of Association general operations, chaired Executive and General meetings
- Served as liaison between graduate students/executive council and department faculty and staff

**Teaching Assistant Representative**, Executive Council of Biology Graduate Student Association  
University of Waterloo, Waterloo ON 2013-2015

- Co-coordinator and presenter at Biology TA Training Workshops
- Re-designed TA time tracking forms and adapted to online survey platform to pursue department objective of improving TA workload and course consistency
- Served as advocate and liaison for graduate teaching assistants with faculty, staff and department

**Co-chair**, University of Waterloo Ecology Group  
University of Waterloo, ON 2012-2013

- Organized and chaired regular meetings and solicited presenters

## Certifications

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**Taxonomic Identification of Harmful Algae in U.S. Marine Waters** August 2021  
Two-week Monitoring and Event Response for Harmful Algal Blooms (MERHAB) Research Program course. Bigelow Laboratory for Ocean Sciences Research and Education, East Boothbay, ME

**Freshwater Algae Identification Intensive Summer Workshop** June 2019  
Two-week summer field course at Louis Calder Center field station, Fordham University, Armonk NY

**Certificate in Fundamentals of University Teaching**,  
Center for Teaching Excellence, University of Waterloo, Waterloo ON

### Workplace Safety Training:

- WHMIS 2015 and WHMIS for Staff
- Laboratory BioSafety Training
- General Lab Safety
- Radiation Open Source Safety
- Wilderness First Aid Certification
- Pleasure Craft Operator License
- Employee Safety Orientation
- Workplace Violence Awareness

G (full) Driver's License  
Pleasure Craft Operator's Card (boat license)

## Awards

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### *Major Awards & Funding*

<b>Award</b>	<b>Value (CAD)</b>	<b>Institution/Agency</b>	<b>Date</b>
Mitacs Career Connect (with Dr. R.C. Rooney)	\$12,500.00	Mitacs, Government of Canada	2018
Ontario Graduate Scholarship	\$15,000.00	Ontario Provincial Government	2014-2015

President's Graduate Scholarship	\$10,000.00	University of Waterloo	2014-2015
Provost Doctoral Entrance Award for Women	\$5,000.00	University of Waterloo	2013
Ontario Graduate Scholarship	\$15,000.00	Ontario Provincial Government	2012-2013
President's Graduate Scholarship	\$10,000.00	University of Waterloo	2012-2013

### *Association and Institutional Scholarships & Awards*

<b>Award</b>	<b>Value (CAD)</b>	<b>Institution/Association</b>	<b>Date</b>
Davis Memorial Scholarship in Ecology	\$5,000.00	University of Waterloo	2016
Hoshaw Travel Grant	\$635.00	Psychological Society of America	2016
Graduate Studies Research Travel Assistantship	\$500.00	Graduate Studies Office, University of Waterloo	2016 (not accepted)
GSA Faculty Award for Volunteering Excellence	–	Graduate Student Association and Graduate Studies Office, University of Waterloo	2016
Special Graduate Award	\$500.00	Department of Biology, University of Waterloo	2014
Senate Graduate Scholarship	\$500.00		2014
Graduate Scholarship	\$735.00	Department of Biology, University of Waterloo	2014
Outstanding Graduate Student Seminar	\$400.00		2013
Fairfax Financial Academic All-Canadian - Graduate Student Athlete	\$1,000.00	University of Waterloo	2013
Graduate Scholarship	\$1,000.00	University of Waterloo	2012
Graduate Entrance Scholarship	\$1,000.00	University of Waterloo	2012
President's Athlete Academic Honour Roll	–	Department of Athletics, University of Waterloo	2009-2012

### **Volunteer and Community Involvement**

- Gulf Coast Humane Society, Corpus Christi, TX 2022 - present
- Science Fair Judge (Gr. 8-10) (St. John's Kilmarnock School) 2018-2020
- Session Chair/Judge, Graduate Student Research Symposium  
University of Waterloo, Waterloo ON Chair: 2014- 2016; Judge: 2018, 2019
- Intramural and/or League Team Captain/Co-captain, Ultimate Frisbee  
University of Waterloo, Waterloo ON 2014-2016
- Volunteer and Room Co-coordinator - "The Giant Cell"  
University of Waterloo Science Open House 2013, 2014
- Choreographer and Off-ice Conditioning coach, Varsity Figure Skating Team  
University of Waterloo, Waterloo ON 2012-2014
- Fundraising Coordinator/Co-coordinator, Varsity Figure Skating Team  
University of Waterloo, Waterloo ON 2010 – 2013
- Varsity athlete, Varsity Figure Skating Team  
University of Waterloo, Waterloo ON 2007-2012