

Genevieve Bernatchez, M.Sc., Biologist

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Education

2012: M.Sc., Northeastern University, Boston, Massachusetts, Biology Department
The nonconsumptive and consumptive effects of the invasive green crab (*Carcinus maenas*) on macroinfaunal diversity, abundance and ecosystem functioning in a New England salt marsh. Advisor: Dr. Geoffrey C. Trussell

2001: Northeastern University, Boston, Massachusetts, Biology Department
East/West Marine Biology Program

2000: Bs. C. in Wildlife Management, Université du Québec à Rimouski, Rimouski, Canada, Biology Department

Research experiences

2014-Present: **Assistant Specialist II** (Dr. Matthew Bracken and Dr. Cascade Sorte Laboratories, University of California, Irvine)

- Managing the daily operations of the labs. Coordinating ongoing research investigation related to the study of the relations between marine communities, ecosystem functioning and climate change. Lab supervisor and safety representative for both laboratories.
- My duties included the set-up and organization of two research laboratories. I ordered, installed and maintained all the research equipment since 2014. I created the Standard Operation Procedures (SOP) for the majority of the instruments and I am also the lab safety officer in charge of implementing the rules and regulations of the University. I am also in charge of coordinating many projects including, 1) evaluating the causes and consequences of changes in biodiversity within the marine environment, and quantifying the relative importance of consumers' top-down and bottom-up effects on the growth and diversity of primary producers and 2) studying the aspects of global change, including climate change and species invasions. One major goal of our labs is to study and follow water nutrients changes in the intertidal zone. My role in these projects is to prepare the SOPs, the equipment, collect the majority of the samples and report the analyses to the PIs. I am in charge of preparing all the glassware for the sampling by acid washing, sterilizing and maintaining a lab free of contamination for our analyses.

- In order to maintain a proper lab I have to use aseptic techniques on a daily basis. I am familiar with the use of ethanol, the Bunsen burner and the use of an autoclave. I am also directly responsible for preparing all the reagents needed to conduct the following nutrient analyses: nitrate, nitrite, phosphate, and ammonium. I have to order, weigh, and pipette all the various chemicals used for each analysis. In our lab, we also monitor changes in ocean acidification, following the Dickson protocol, for total alkalinity using a titrator. I have also created a method to extract and analyze chlorophyll from algae growing on tiles left in the intertidal zone.
- The labs maintain an indoor recirculating seawater system to grow and maintain algae and invertebrates; my role consists of monitoring, maintaining, cleaning and troubleshooting the seawater system. I have to monitor the system on a daily basis to assure that the critical parameters, such as pH, temperature and salinity remain constant. I have to clean and change the water on a weekly basis and feed the organisms. The majority of my days are spent in the lab, running samples, maintaining the equipment and helping with various projects.
- We recently established a memorandum of understanding (MOU) for charging other laboratories at UCI for the use of our Lachat (nutrients analyzer). I am the person responsible for analyzing water samples, quality control, and reporting the data to other PIs.
- Currently, I am also mentoring many undergraduate students who are helping me in the lab and in field, I have the opportunity to teach them the various protocols and methods we are using in our laboratories.
- <http://faculty.sites.uci.edu/biodiversity/lab> and <http://cascadesorte.org/>

June – September 2014: Long Island Sound Study Water Quality Intern (NEIWPCC)

- Compile and format water quality datasets for multivariate time series analysis to assist with a review of the LISS monitoring program. Additional fieldwork, laboratory analyses and office work

2012-2014: Research Assistant, National Oceanic Atmospheric Administration, National Marine Fisheries Service (NOAA, NMFS)

- Collection, processing, and analysis of biological, chemical and environmental samples as part of an ongoing research. I worked on several projects related to aquaculture, ocean acidification, dredging effects on marine habitat, and the use of bivalves for nutrient reduction in the coastal environment.

Laboratory safety training

2018: EH&S Professional Workshop (UCR), 8 hours credit completed on 03/28/2018

2018: EH&S Generalist ecourse

2016-present: Floor warden, Steinhaus Hall 4th floor

Teaching experiences

2010-present: **Part-time lecturer**

College of Professional Studies at Northeastern University for the following classes:
Biology 1 (Principles), class and lab, Biology 2 (Diversity) lab
Starting: 6/1/2010-present

2005-2011: **Lead Marine Invertebrate Zoology teaching assistant**

Three Seas Program at Northeastern University
Responsibilities include: create the lab curriculum, write lab instructions, grade
Starting: 9/1/2005-12/20/2011

2001-2012: **Teaching assistant**

Northeastern University: Experimental Design in Marine Ecology, General Biology 1 and 2, Neuroethology, the Biology of Fishes, Marine Botany, Marine Birds and Mammals, Introduction to Marine Biology
Starting: 9/1/2001-12/20/2012

Guest lectures

2015: **Guest lecturer**

Marine Biology class, University of California Irvine, (Dr. Matthew Bracken and Dr. Cascade Sorte), lecture on Marine Invertebrate Diversity

2011: **Guest lecturer**

Ecology class, Northeastern University (Dr. Cascade Sorte), lecture on Conservation Biology

2010: **Guest lecturer**

Ecology Class, Eastern Connecticut State University, (Dr. Joshua Idjadi) on Salt Marsh Ecology

Skills

Citizenship: American and Canadian

Language: English and French (Fluent)

Computer program/software: PC, MAC, Microsoft Word, Excel, PowerPoint, JMP, ArcGIS, Primer, R

Certification:

1997: Introduction to Pleasure Boating certified -33hours

2000: NAUI scuba diver certification (Open Water Certification, 60 feet)

2014: Maps and the Geospatial Revolution by The Pennsylvania State University on Coursera (GIS)

2015: Wilderness First Aid 2 days training course (University of California, Irvine)

2015: Analysis of Multivariate Data from Ecology and Environmental Science, using PRIMER California State University, Long Beach CA, January 12-16

Technical Skills- Research

Nutrients and Chlorophyll *a* analysis using Lachat Quickem 8500 method, Quattro Seal Analytical instrument, spectrophotometer and fluorometer techniques

Maintaining and managing indoor seawater system to grow and raise marine algae and invertebrates

Sterile techniques (acid wash, ethanol baths, use of bunsen burner, autoclave)

Aseptic techniques to maintain algal cultures viable and bacteria-free

Preparing reagents, solutions and medium for algae growth (liquid base and/or agar)

DIC analyzer, microprobes usage, pipetting, weighing, and mixing

Carbon/Nitrogen ratio analysis using FLASH EA 1112 series NC soil analyzer and an Elemental Analyzer

Methods for analyzing carbohydrates, protein content, DIN, alkalinity, pH, nutrients, moisture content, C/N ratio, total phosphorus, YSI, Lamotte test kit

Field collection: benthic samples, water samples using CTD, YSI and Niskin bottles, fish sampling using seine nets, plankton nets

Benthic sampling using coring, staining and preserving techniques. Using both dissection and compound microscopes, performing dissections

Maintaining and conducting field experiments on phytoplankton (natural and cultured species), fin fish (*Centropristis striata*, black sea bass), crustaceans (*Carcinus maenas*, green crab), mollusks (*Littorina littorea*, common periwinkle) and many other marine species

Conducting field experiments in marine intertidal zones and salt marsh habitats

Honors and awards

2006-2009: National Estuarine Research Reserve Graduate Research Fellowship for 3 years of funding (\$20,000 annually)

2004-2005: Summer stipend, Wells National Estuarine Research Reserve, Maine (\$4,000 annually)

Publications

Altieri, A.H., G.C. Trussell, P.J. Ewanchuk, **G. Bernatchez** and M.E.S. Bracken (2009). Consumers control diversity and functioning of a natural marine ecosystem. Plos One, 4(4), e5291.

Bernatchez, G. (2012). The nonconsumptive and consumptive effects of the invasive green crab (*Carcinus maenas*) on macroinfaunal diversity, abundance and ecosystem functioning in a New England salt marsh. MA thesis, Northeastern University.

Bracken MES, Silbiger NJ, **Bernatchez G**, Sorte CJB. (2018) Primary producers may ameliorate impacts of daytime CO₂ addition in a coastal marine ecosystem. PeerJ 6:e4739 <https://doi.org/10.7717/peerj.4739>

Bracken, M.E.S., Oates, J.M., Badten, A.J., **Bernatchez G.** (2018) Marine Biology 165: 165. <https://doi.org/10.1007/s00227-018-3422-z>

Sorte C.J.B, **Bernatchez G.**, Milan K.A.S., Pandori L.M., Silbiger N.J., Wallingford P.D. (2018). Thermal tolerance limits as indicators of current and future intertidal zonation patterns in a diverse mussel guild. Submitted to Marine Biology

Presentations

Bernatchez, G., J.M. Oates and M.E.S. Bracken. 2017. Contributions of grazers to nitrogen recycling in tide pools: not all species are excreting equally. Southern California Academy of Sciences Annual Meeting, Santa Monica, California.

Bernatchez, G. 2015. The nonconsumptive and consumptive effects of the invasive green crab (*Carcinus maenas*) on macroinfaunal diversity and abundance in a New

England salt marsh. California State University Long Beach Seminar, Long Beach, California.

Bernatchez, G., G.C. Trussell. 2010. Non-consumptive effects of an invasive predator on macroinfaunal functional feeding groups in a New England salt marsh. Benthic Ecology Meeting, Wilmington, North Carolina.

Bernatchez, G., G.C. Trussell. 2008. Trait-mediated effects of an invasive predator on macroinfaunal functional feeding groups in a New England mud flat. Benthic Ecology Meeting, Providence, Rhode Island.

Bernatchez, G., G.C. Trussell, P.J. Ewanchuk. 2007. The non-consumptive indirect effect of an invasive predator on macroinfaunal diversity and abundance in a New England mud flat. Benthic Ecology Meeting, Atlanta, Georgia.

Bernatchez, G., G.C. Trussell, P.J. Ewanchuk. 2006. The effects of crab-gastropod interactions on the benthic macroinfaunal community of a salt marsh mudflat. Poster. Benthic Ecology Meeting, Quebec City, Canada.

Bernatchez, G., G.C. Trussell, P.J. Ewanchuk. 2005. The effects of the invasive asian shore crab (*Hemigrapsus sanguineus*) on benthic macrofaunal communities in a southern Maine salt marsh. Benthic Ecology Meeting, Williamsburg, Virginia.

Bernatchez, G., G.C. Trussell, P.J. Ewanchuk. 2003. Evidence of interspecific competition between two invasive shore crabs (*Carcinus maenas* and *Hemigrapsus sanguineus*)? Poster. Benthic Ecology Meeting, Groton, Connecticut

Service and Outreach

2014-Present: Mentorship of independent research by undergraduate interns at UC Irvine, including training in research techniques and data analyses.

2008: Participant in the Boston Islands Harbor Intertidal Bioblitz, Massachusetts for the annual fauna and flora survey of the Boston Islands.

2002-2012: Mentorship of graduate and undergraduate student marine biology research associated with the Three Seas Program at Northeastern University.

2001-2012: Volunteering with the outreach program at the Marine Science Center (Northeastern University, Boston). Specific activities included helping with the coastal ocean science academy, assisting with the MSC annual open house, giving guided tours of the intertidal zone and tide pools.

1999-2000: Natural science interpreter, Parc du Mont St-Bruno, Government Park, Québec, 2000 and Parc de l'île Bonaventure et du Roche Percé, Government Park, Québec, 1999. Interpretation of the nature and history of that region.