

# Robert J Holmberg, Ph.D.

Research Scientist – Marine Carbonate Chemistry

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Websites: [Downeast Institute Profile](#) • [ResearchGate Profile](#) • [aquariumtradedata.org](#)

## Profile

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Research Scientist in Marine Carbonate Chemistry at the Downeast Institute in Beals, Maine.

### Skills and Experience:

- Marine aquarium systems design and maintenance:
  - o Design and construction of pH-stat CO<sub>2</sub>-dosing ocean acidification experimental aquarium systems (including electronics and plumbing) at Downeast Institute and UMass Boston
  - o Computerized aquarium controller programming (Digital Aquatics, Neptune Systems, Raspberry Pi)
  - o Simultaneous maintenance of dozens of aquaria housing thousands of animals
- Expertise in marine carbonate chemistry, biocalcification, global environmental change
- Coral reef fish husbandry and larviculture (anemonefishes and grunts: *Amphiprion clarkii*, *A. ocellaris*, *A. percula*, *Haemulon chrysargyreum*)
- Live food culture (copepods: *Parvocalanus spp.*, *Pseudodiaptomus spp.*; algae: *Isochrysis spp.*)
- Shellfish larviculture (*Mytilus edulis*)
- Student mentoring (4 NSF REU students, 40+ undergraduate research assistants/volunteers)
- Communication and teaching (international scientific research presenter, undergraduate-level guest lecturer and teaching assistant, project ambassador to Philippines government)
- Data science (advanced statistical modeling, data processing, data visualization)
- Scientific writing (several published scientific manuscripts, NSF grant proposals)
- Research project coordination (Downeast Institute, University of Massachusetts Boston, Roger Williams University, Philippines Bureau of Fisheries and Aquatic Resources)
- PADI-certified Open Water Diver

**Main Software Expertise:** R, IBM SPSS, ABBYY FlexiCapture, OutWit Hub, Microsoft Office Suite. Additional experience with ArcGIS, Python, SQL.

## Experience

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### Research Scientist in Marine Carbonate Chemistry – Downeast Institute (Sept. 2021 – present)

As a research scientist in marine carbonate chemistry at Downeast Institute, I am continuing the work I started as a postdoctoral associate to study ocean acidification and warming impacts on shellfish using the laboratory I designed. In addition, I am engaged in carbonate chemistry monitoring projects on local tidal mudflats. I develop grant proposals to support my work.

### **Postdoctoral Associate in Marine Carbonate Chemistry – Downeast Institute (Aug. 2019 – Aug. 2021)**

As a postdoctoral associate in marine carbonate chemistry under Dr. Brian Beal, I designed and built a new, state-of-the-art pH-stat CO<sub>2</sub>-dosing experimental system to study ocean acidification impacts on local, commercially-important marine fauna including *Mya arenaria*, *Mytilus edulis*, and *Homarus americanus*. My work will develop a greater understanding of ocean acidification impacts on marine calcifiers, and increase the capacity of the fishing and aquaculture industries to adapt to future ocean conditions.

### **Scientific Research Assistant – University of Massachusetts Boston (Sep. 2013 – Aug. 2019)**

As a graduate student pursuing degrees in marine science, my dissertation studied ocean acidification impacts on coral reef fishes, in particular otolith (ear stone) morphology. I completed research projects requiring the larviculture of several coral reef fish species, as well as the design and construction of a specialized ocean acidification experimental system for maintaining seawater pH treatments using electronic controllers and a CO<sub>2</sub> gas-dosing apparatus. I also acted as a teaching assistant for undergraduate-level environmental science and statistics courses, taught guest lectures, mentored undergraduate students, published scientific manuscripts, presented my research as a speaker at international science conferences, and submitted scientific research grant proposals.

### **Data Science Research Assistant – Roger Williams University CEED (Jan. 2009 – Dec. 2015)**

Studying the trade of saltwater aquarium wildlife, I used OCR software and SQL to scrape imported species data from paper invoices and construct a large database. I helped develop [aquariumtradedata.org](http://aquariumtradedata.org) to publish this database and visualize the data. I also leveraged this database to study invasive species and develop tools to combat wildlife crime in the aquarium trade. Parts of this project were conducted in collaboration with the Philippines Bureau of Fisheries and Aquatic Resources.

## **Education**

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**PhD – Marine Science & Technology**, University of Massachusetts Boston (**May 2020**)

**MS - Marine Science & Technology**, University of Massachusetts Boston (**March 2018**)

**BS - Environmental Science**, Roger Williams University (**May 2012**)

## **Awards**

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**Discovery and Innovation Award**, School for the Environment, University of Massachusetts Boston (**May 2020**)