**Matthew W. Gray, Ph.D.**

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## I. Education

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|---|---|---|
| Oregon State University | Ph.D. Fisheries Science | 2009-2016 |
| Drexel University | M.Sc. Environmental Science | 2007-2009 |
| Wagner College | B.Sc. Biology | 2001-2005 |

## II. Professional Background

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|---|---|---|
| University of Maryland | Assistant Professor | 2017-Present |
| University of Maine | Postdoctoral Research Associate | 2016-2017 |
| Oregon State University | Graduate Research Assistant | 2009-2016 |
| Drexel University | Graduate Research Assistant | 2007-2009 |
| G&C Environmental Services | Environmental Consultant | 2006-2008 |
| Rutgers University | Research Technician | 2005-2006 |

## III. Research

### A. Areas of Expertise

Ecological physiology of bivalves, restoration, habitat evaluation, aquaculture production, bivalve ecosystem services, and ocean acidification.

### B. Peer-Reviews Journal Publications

**M.W. Gray** and C. Langdon (2018). *Ecophysiology of the Olympia Oyster,* Ostrea lurida*, and Pacific Oyster*, Crassostrea gigas. Estuaries and Coasts, 41: 521-535

**M.W. Gray**, C.J. Langdon, G. G. Waldbusser, B. Hales, and S. Kramer (2017). *Mechanistic understanding of ocean acidification impacts on larval feeding physiology and energy budgets of the mussel* M. californianus. Marine Ecology Progress Series, 563: 1-94. DOI:10.3354/meps11977

G.G. Waldbusser, **M.W. Gray**, B. Hales, C.J. Langdon, B.A. Haley, P. Schrader, E.L. Brunner, C.A. Miller, I. Gimenez, and G. Hutchinson. (2016). *Slow shell building, a trait for resistance to acute ocean acidification impacts*. Limnology and Oceanography, 61(6): 1969-1983. DOI: 10.1002/lno.10348.

**M.W. Gray**, S. Kramer, and C.J. Langdon (2015). *Particle processing and gut kinematics of planktotrophic bivalve larvae.* Marine Biology, 162(11):2187-2201. DOI:10.1007/s00227-015-2746-1.

G.G. Waldbusser, B. Hales, C.J. Langdon, B.A. Haley, P. Schrader, E.L. Brunner, **M.W. Gray**, C.A. Miller, I. Gimenez, G. Hutchinson (2015). *Ocean acidification has multiple modes of action on bivalve larvae*. PlosOne, 10(6) DOI: 10.1371/journal.pone.0128376

G. G. Waldbusser, B. Hales, C. J. Langdon, B.A. Haley, P. Schrader, E. L. Brunner, **M. W. Gray**, C. A. Miller, I. Gimenez (2015). *Saturation-state sensitivity of marine bivalve larvae to ocean acidification*. Nature Climate Change, 5:273-280. DOI:10.1038/nclimate2479

**M. W. Gray** and Danielle Kreeger (2014). *Monitoring fitness of caged mussels (Elliptio complanata) to assess and prioritize streams for restoration*. Aquatic Conservation Marine and Freshwater Ecosystems, 24(2):218-230. DOI:10.1002/aqc.2395

P. S. E. zu Ermgassen, **M. W. Gray**, C. J. Langdon, M. D. Spalding, R. D. Brumbaugh (2013). *Quantifying the historic contribution of Olympia oysters to filtration in Pacific Coast (USA) estuaries and the implications for restoration objectives*. Aquatic Ecology, 47(2): 149-161. DOI:10.1007/s10452-013-9431-6.

J. Burger, M. Gochfeld, C. Jeitner, **M. Gray**, T. Shukla, S. Shukla, S. Burke (2007). *Kelp as a bioindicator: Does it matter which part of 5 m long plant is used for metal analysis?* Environmental Monitoring and Assessment, 128(1-3):311-21. DOI:10.1007/s10661-006-9314-6

**C. Manuscripts in Prep**

**M. W. Gray**, P.E. zu Ermgassen, J. Gair, E. Lemagie, J. Lerczak, and C. J. Langdon. *Predicted filtration services of historic and restored populations of native Olympia oysters (Ostrea lurida) and non-native Pacific (Crassostrea gigas) oysters.* Estuaries and Coasts. In revision.

**M.W. Gray**, O. Chaparro, S. P. O'Neil, D. Brady. *Brood chambers may prepare young for tomorrow's acidic oceans and estuaries.* Journal of Shellfish Research. Submitted.

**M.W. Gray** and C. Langdon. *Particle processing by Olympia oysters (Ostrea lurida) and Pacific oysters (Crassostrea gigas)*. Submitted.

**M.W. Gray**, D. Brady, A. Ecker, J. Snyder. *Site selection and production estimates for Eastern oyster Crassostrea virginica aquaculture throughout Maine U.S.A.* In preparation.

**M.W. Gray**, D. C. Brady, J. Testa, K. Copeland, L. Mayer. *Changes in estuarine carbonate carrying capacity amid shellfish aquaculture expansion and ocean acidification.* In preparation.

**D. Technical reports**

Brady, D.C., J.V. DePinto, S. C. Chapra, D.M. Di Toro, M. A. M. Friedrich, **M.W. Gray**, T. Jordan, M. Xia. (2017)**.** Scientific and Technical Advisory Committee: Chesapeake Bay Water Quality and Sediment Transport Model (WQSTM) Review**.**

**E. Presentations**

M.W. Gray. *Brooding: a life-history trait that is preparing young for ocean acidification?* Virginia Institute of Marine Biology. Gloucester Point, VA; 10/2017

M. W. Gray, D. C. Brady. *Remote sensing and in situ monitoring to enhance shellfish production and identify new habitats in Maine.* National Shellfish Association, Knoxville, Tennessee; 03/2017

M. W. Gray, P. zu Ermgassen, E. Lemagie, J. Lerczak, C. Langdon, J. Gair. *Filtration services of the native Olympia oyster (Ostrea lurida) and the introduced Pacific oyster (Crassostrea gigas): Improved resolution of ecosystem services from physiological and oceanographic studies*. Pacific Coast Shellfish Growers Association, Hood River; 09/2015

M. W. Gray, C. Langdon. *Feeding physiology of the native Olympia oyster (Ostrea lurida) and the introduced Pacific oyster (Crassostrea gigas): Implications for ecosystem services and restoration from laboratory and in situ studies*. National Shellfisheries Association, Monterey, California; 03/2015

M. W. Gray, S. Kramer, C. Langdon. *A novel dual bead technique for evaluating the feeding physiology and behavior of bivalve larvae*. National Shellfish Association, Monterey, California; 03/2015

M. W. Gray, S. Kramer, C. J. Langdon. *A novel technique for determining ingestion rates, gut passage time, and gut mechanics of bivalve larvae.* Pacific Coast Shellfish Growers Association, Vancouver, Washington; 09/2014

M. W. Gray, C.J. Langdon, G.G. Waldbusser, B. Hales, B. Haley, P.S. Schrader. *A novel technique for determining the impact of ocean acidification on the feeding physiology of bivalve.* Coastal and Estuarine Research Federation, San Diego, California; 11/2013

M. W. Gray, C.J. Langdon, G.G. Waldbusser, B. Hales, B. Haley, P.S. Schrader. *A novel technique for determining the impact of ocean acidification on the feeding physiology of bivalve larvae.* Pacific Coast Shellfish Growers Association, Bend, Oregon; 09/2013

M. W. Gray, C. Langdon. *The feeding physiology of Olympia oysters (Ostrea lurida).* National Shellfisheries Association, Seattle, Washington; 04/2012

M. W. Gray, Chris J. Langdon*. Feeding physiology of Olympia oysters (Ostrea lurida).* Pacific Coast Shellfish Growers Association, Salem, Oregon; 10/2011

M. W. Gray, R. Vander Schaaf, J. Johnson, S. Groth, C. Langdon. *The feeding physiology of the native Olympia oyster (Ostrea lurida).* Pacific Coast Shellfish Growers Association, Tacoma, Washington; 10/2010

M. W. Gray. *Fiddler crabs as bioindicators of recovery from an oil spill in Staten Island salt marshes.* Metropolitan Association of College and University Biologists, Brooklyn, NY; 11/2004

**F. Awards and Grants**

Deerbrook Charitable Trust: *The unintended effects of oyster restoration – hatchery-induced genetic changes to larval behavior and feeding*, 2017 ($195,263). Co-PI

Oregon Society of Conchologists Scholarship for Mollusk Research: *Native oyster ecophysiology, 2013-2015* (total sum: $2,000)

Mamie Markham Graduate Research Award 2013 & 2015 (total sum: $20,000)

National Estuarine Research Reserve System (NOAA) Graduate Research Fellowship 2010-2014 ($85,926)

Partnership for The Delaware Estuary Science Fellowship: *Freshwater mussel restoration in Southeastern Pennsylvania* 2007-2009.

**G. Professional Participation:**

Active Professional Society Membership

National Shellfish Association
Coastal and Estuarine Research Federation
Association for the Science of Limnology and Oceanography

Journal Referee

Marine Ecology Progress Series (2), Journal of Experimental Marine Biology and Ecology (2), Journal of Marine Biology, Journal of Fish Diseases, PeerJ, Science of The Total Environment, Elementa, Hydrobiologia, Ecological Modelling.

## IV. Outreach and Service

### A. Current Committee Involvement:

Maryland Department of Natural Resources, Oyster Advisory Commission Member, 2018-Present

Lead reviewer, 2017. Oyster module- *effect of oyster sanctuaries, aquaculture, and fisheries on the water quality of Chesapeake Bay*. Chesapeake Bay Program: Scientific and Technical Advisory Committee (STAC).

Maryland Sea Grant Steering Committee on Aquaculture Research in Maryland, 2017.

### B. Press

Alex Mann. *State slashes oyster restoration acreage goal*. The Washington post 11/2017

## V. Teaching and Training:

Instructor: Estuarine Oceanography. University of Maine, Darling Marine Center Walpole ME 2016.

Guest Lecturer, Oyster restoration and ecosystem services. Aquaculture, Oregon State University, Newport OR 2015.

Guest Lecturer, Oyster aquaculture and restoration. Costal Ecology and Resource Management, Oregon State University, Newport 2014.

Guest Lecturer Bivalve reproduction and larval nutrition. Oregon Coast Community College, Newport OR 2013

Guest Lecturer, Oyster feeding physiology and larval nutrition Oregon Coast Community College, Newport OR 2012

## VI. Advising and Mentoring:

Undergraduate Research Mentoring

Alwyn Ecker, Wheaton College, University of Maine Undergraduate Internship, 2017

Tania Couture, McGill University, University of Maine Undergraduate Internship, 2017

Andrew Moreira, Mt. Allison University, University of Maine Undergraduate Internship, 2016

Avery Andrus, University Grand Valley State University, Oregon State University Research Experience for Undergraduate- NSF 2013

Ashley Bulesco, University of Hawaii, Oregon State University Research Experience for Undergraduate- NSF 2011

Ed Phillips, Undergraduate Senior Research Project, Oregon State University, 2010