

# Philip M. Gravinese

Florida Southern College – 111 Lake Hollingsworth Drive, Lakeland, FL 33801

[pgravinese@flsouthern.edu](mailto:pgravinese@flsouthern.edu)

---

## **Professional Preparation**

Florida Institute of Technology	Biology	Ph.D., December, 2016
Florida Institute of Technology	Marine Biology	M.S., May, 2007
Florida Institute of Technology	Marine Biology	B.S., May, 2003 - <i>Cum laude</i>

## **Faculty Appointments**

Assistant Professor, Biology Department, Florida Southern College (August 2020–present)

## **Previous Appointments**

Postdoctoral Fellowship, Fisheries Ecology & Enhancement Program, Mote Marine Laboratory (2017–2020)  
NSF Doctoral Research Assistantship, Dept. of Marine and Environmental Systems, Florida Institute of Technology (2014)

Link Foundation Graduate Fellow, Smithsonian Institution, Ft. Pierce, FL (2004)

NSF Research Experience for Undergraduate Fellowship, Dept. of Biological Sciences, Florida Institute of Technology (2002)

## **Teaching Appointments**

### Current

Adjunct Professor, Oceanography and Biology courses, St. Petersburg College, FL (2016–present)

### Previous Teaching Appointments

Professional Educator, Dept. of Biological Sciences, Florida Institute of Technology (2017–2020)

- contracted to design inquiry-lessons centered around ongoing faculty research

Adjunct Professor, Eastern Florida State College (2006–2011; 2016)

- Oceanography, Biology, Environmental Science courses

Graduate Teaching Assistant, Dept. of Biological Sciences, Florida Institute of Technology (2012–2016)

- Biological Statistics and Invertebrate Zoology courses

Ph.D. Graduate Fellowship, NSF GK–12 Program, Dept. of Biological Sciences, Florida Institute of Technology (2011–2012)

M.S. Graduate Fellowship, NSF GK–12 Program, Dept. of Biological Sciences, Florida Institute of Technology (2006–2007)

Graduate Teaching Assistant, Dept. of Biological Sciences, Florida Institute of Technology (2003–2006)

- Marine Ecology, Tropical Marine Ecology field course, Biology, and Community Ecology courses

### Additional Teaching Experience

Certified Professional Educator, Hillsborough Public Schools, Tampa, FL (2016–2017)

Professional Educator and Academic Lead, Broadreach Academic Treks, (2011)

- Mentored students conducting independent research on Sea Turtle biology in Costa Rica

Environmental Academy Director, Brevard Public Schools, Melbourne, FL (2009–2011)

Certified Professional Educator, Brevard Public Schools, Melbourne, FL (2007–2011)

Professional Educator Fellowship, NSF GK–12 Program, Florida Institute of Technology (2008–2010)

## **Research and Education Funding**

### Current Research Funding

Tampa Bay Environmental Restoration Fund: *Do pH variable habitats provide refuge for stone crabs from ocean acidification?* – 2-years of funding, \$70,155 (2019–present)

Protect Our Reef Grant: *The effects of ocean acidification and elevated temperature on the Caribbean king crab: Implications for coral restoration* – \$14,415; (2019–present)

### Previous Research Funding

Mote Marine Laboratory Post-doctoral Fellowship: *Determining the impacts of environmental stressors on commercially important crustaceans* – 3.5 years of funding, \$416,098 (2017–2020)

Mote Scientific Foundation: *Determining the tolerance of sublegal stone crabs to natural variations in red tide: A rapid response assessment* – \$8,200; (2019–2020)

Protect Our Reef Young Investigator Award: *Measuring the impacts of Everglades restoration on post-larval swimming behaviors of the Florida stone crab* – \$12,667; (2017–2019)

Protect Our Reef Young Investigator Award: *Effects of elevated pCO<sub>2</sub> and temperature on larval development and survivorship of the commercially important reef tract organism, The Florida stone crab* – \$13,243; (2014–2016)

Protect Our Reef Grant: *Effects of ocean acidification on embryonic development and larval morphology in commercially and ecologically important reef organisms* – \$27,017; (2012–2013)

### Research and Education Funding for Hands-on Student Research Experiences

Mote Doctoral Student Fellowship – \$15,000; (2019), research supplies and stipend to provide an independent research experience to a Florida Institute of Technology Ph.D. student

Mote NSF REU – \$5000 stipend to undergraduate, (summer 2018–2020), provided independent research experiences for three undergraduates

Mote REU – \$5000 stipend to undergraduate, (four students in 2019–2020), research supplies and stipend to provide independent research experiences for four undergraduates

Mote Scientific Foundation: *Habitat selection in juvenile stone crabs* – \$3,450; (2018), Independent Research Experiences for St. Petersburg College Undergraduates

St. Petersburg College – Excellence in Teaching and Learning Award: *Incorporating Videography and Art into the Oceanography Course* – \$750; (2016), provided equipment to enhance student inquiry-learning experiences in the classroom

Captain Planet Foundation – \$4000; student monitoring water quality along the Indian River Lagoon

Brevard Schools Foundation – \$2000; funding to support inquiry projects in a science research course

Florida Sport Fishing Association – \$1500; to monitor water quality in local seagrass habitats

Best Buy Educator Grants – \$4000; to fund my high school classroom with laptops for students to complete data analyses on research projects and to design posters for research presentations

### Peer-Reviewed Publications (Undergraduate mentees as co-authors are underlined>

1. **Gravinese, P.M.**, Aronson, R.B., Toth, L.T. 2020. Digging into the geologic record of environmentally driven changes in coral reef development. *Oceanography*. 33(1): 85–91. <https://doi.org/10.5670/oceanog.2020.113>.
2. **Gravinese, P.M.** 2020. The response of juvenile stone crabs to hypoxia: size matters. *Journal of Experimental Marine Biology and Ecology*. 523:151269. <https://doi.org/10.1016/j.jembe.2019.151269>.
3. **Gravinese, P.M.**, Enochs, I., Manzello, D., van Woessik, R. 2019. Ocean acidification reverses the swimming direction of larval stone crabs. *Biology Letters*. 15:20190414. <https://dx.doi.org/10.1098/rsbl.20190414>.
4. Frehm, V., **Gravinese, P.M.**, Toth, L.T. 2019. Cultivating future environmental stewards: a citizen science case study at John D. MacArthur Beach State Park. *Florida Scientist*. 82(4):112–121.
5. **Gravinese, P.M.**, Saso, E., Lovko, V.J, Blum, P., Cole, C., Pierce, R.H. 2019. *Karenia brevis* causes high mortality and impaired swimming behavior of Florida stone crab larvae. *Harmful Algae*. 84:188–194. doi: <https://doi.org/10.1016/j.hal.2019.04.007>.

6. **Gravinese, P.M.**, Toth, L.T., Randall, C.J., Aronson, R.B. 2018. How do upwelling and El Niño impact coral-reef growth? A guided, inquiry-based lesson. *Oceanography*. 31(4):148–188. doi: <https://doi.org/10.5670/oceanog.2018.424>.
7. **Gravinese, P.M.** 2018. Vertical swimming behavior in larvae of the Florida stone crab, *Menippe mercenaria*. *Journal of Plankton Research*. doi: <https://doi.org/10.1093/plankt/fby040> (Featured Article).
8. **Gravinese, P.M.**, Kronstadt, S.M., Clemente, T., Cole, C., Blum, P., Henry, M.S., Pierce, R.H., Lovko, V.J. 2018. The effects of red tide (*Karenia brevis*) on reflex impairment and mortality of sublegal Florida stone crabs, *Menippe mercenaria*. *Marine Environmental Research*. 137:145–148. doi: <https://doi.org/10.1016/j.marenvres.2018.03.004>.
9. **Gravinese, P.M.**, Enochs, I., Manzello, D., van Woesik, R. 2018. Warming and pCO<sub>2</sub> effects on Florida stone crab larvae. *Estuarine, Coastal and Shelf Science*. 204:193–201. doi: <http://doi.org/10.1016/j.ecss.2018.02.021>.
10. **Gravinese, P.M.** 2018. Ocean acidification impacts the embryonic development and hatching success of the Florida stone crab, *Menippe mercenaria*. *Journal Experimental Marine Biology and Ecology*. 500: 140–146. doi: <http://doi.org/10.1016/j.jembe.2017.09.001>.
11. Staatterman E.R., Bhandiwad, A.A., **Gravinese, P.M.**, Moeller, P.M., Reichenbach, Z.C., Shantz, A.A., Shiffman, D.S., Toth, L.T., Warneke, A.M., Gallagher, A.J. 2014. Lights, camera, science: The utility and growing popularity of film festivals at scientific meetings. *Ideas in Ecology and Evolution*: 7:11–16. Link: <https://ojs.library.queensu.ca/index.php/IEE/article/view/5098>.
12. C.L. Boleman, **Gravinese, P.M.**, Muse, E., Marston, A., Windsor, J.W. 2013. Corals on Acid: Inquiry-based activity bringing students to a better understanding in ocean acidification impacts. *Oceanography*. 26(4): 164–169. doi: <https://doi.org/10.5670/oceanog.2013.87>.
13. Krinsky, L., **Gravinese, P.M.**, Epifanio, C., Tankersley, R.A. 2009. The timing of larval release from different tidal regimes in the Florida Stone crab, *Menippe mercenaria*. *Journal Experimental Marine Biology and Ecology*. 373(2). 96–101. doi: <https://doi.org/10.1016/j.jembe.2009.03.013>.

### **Published Technical Reports**

1. **Gravinese, P.M.**, Flannery, J.A., and Toth, L.T. 2016. A methodology for quantifying trace elements in the exoskeletons of Florida stone crab (*Menippe mercenaria*) larvae using inductively coupled plasma optical emission spectrometry (ICP–OES). U.S. Geological Survey Open-File Report 2016–1148, 12p. doi: <http://doi.org/10.3133/ofr20161148>.

### **Manuscripts in Review**

1. **Gravinese, P.M.**, Munley, M.K., Kahmann, G., Cole, C., Blum, P., Lovko, V.J, Pierce, R.H. The tolerance of sublegal Florida stone crabs (*Menippe mercenaria*) during prolonged exposure to hypoxia and red tide (*Karenia brevis*). in review: *Harmful Algae*.
2. **Gravinese, P.M.**, Fisher, S., Boleman, C.L., Spadaro, J., and Page, H. The orientation and navigation of post-larval spiny lobsters during exposure to ocean acidification. in review: *Scientific Reports*.

### **Manuscripts in Preparation (Undergraduate mentees as co-authors are underlined)**

1. **Gravinese, P.M.**, Douwes, A., Perry, S., MacDonald, J. Detection and avoidance of hypoxic water by sublegal stone crabs. in preparation for *Marine Biology*.
2. **Gravinese, P.M.**, Douwes, A., Eaton, K., and Muller, E.M. The tolerance of coastal corals to hypoxia and their ability to recover. in preparation for *Coral Reefs*.
3. **Gravinese, P.M.**, and Cole, C. Effects of hypoxia and elevated temperature on sub-legal stone crab foraging behavior. in preparation for *Marine Ecology Progress Series*.
4. **Gravinese, P.M.**, and Pipkin, C. The cost of delayed metamorphosis in blue and stone crab post-larvae. in preparation for *Marine Behavioral Physiology*.

5. **Gravinese, P.M., Macke, H. Fisher, S and Cole, C.** Habitat selection in juvenile stone crabs. in preparation for *Journal Experimental Marine Biology and Ecology*.
6. **Gravinese, P.M., M. Foy, E. Lessard, J.W. Murray.** The effect of elevated  $p\text{CO}_2$  on microzooplankton biomass, abundance, and community structure – A mesocosm study in the Salish Sea. in preparation for *Journal of Plankton Research*.

**Contributed Papers Presented at Scientific Meetings and Invited Seminars**

- Gravinese, P.M.,** Sensitivity of regionally specific commercially important taxa to ocean acidification. NOAA Ocean Acidification PI Meeting, January 2020.
- Gravinese, P.M.,** Let's talk about giving talks. Mote NSF REU professional development seminar. 2018–2020.
- Gravinese, P.M.,** The effects of red tide on larval stone crabs. Mote Science Café. 2019.
- Gravinese, P.M.,** Have red hot seas and shellfish on acid got you feeling crabby? St. Petersburg Nerd Nite. 2019.
- Gravinese, P.M.,** The impacts of red tide on larval stone crabs. Florida Stone crab advisory panel. 2019.
- Gravinese, P.M.,** Changes in regional hydrology could modify the swimming behavior of larval stone crabs. Greater Everglades Ecosystem Restoration Conference. 2019.
- Gravinese, P.M.,** Enochs, I., Manzello, D., van Woesik, R. Warming &  $p\text{CO}_2$  effects on stone crab larvae. Gordon Research Conference on Global Change Biology. 2018.
- Gravinese, P.M.** Warming &  $p\text{CO}_2$  effects on stone crab larvae. National Shellfisheries Meeting. 2018.
- Gravinese, P.M.** Effects of elevated  $p\text{CO}_2$  and temperature on the Florida stone crab, *Menippe mercenaria*. National Marine Science Educator Association Meeting, 2017.
- Gravinese, P.M.** and R.A. Tankersley. Does decreased pH negatively impact the embryonic development, hatching success, and larval morphology of the Florida Stone crab, *Menippe mercenaria*? Florida Academy of Sciences, 2014.
- Gravinese, P.M.,** Foy, M., Lessard, E., and Murray, J.W. The effect of elevated  $p\text{CO}_2$  on microzooplankton biomass, abundance, and community structure – A mesocosm study in the Salish Sea. Ocean Sciences Meeting, ASLO. 2014.
- Gravinese, P.M.** 2014. Feeling cornered: two stories about environmental changes occurring along U.S. coasts. Smithsonian Marine Station: Morning Lecture Series. Fort Pierce, FL.
- Gravinese, P.M.** 2013. Responding in a Pinch: Crustacean behavioral responses to environmental factors. Smithsonian Marine Station: Morning Lecture Series. Ft Pierce, FL.
- Toth, L.T. and **Gravinese, P.M.** 2013. Promoting marine science through film: the youth making ripples initiative. Learn Green Conference. West Palm Beach, FL 2013.
- Gravinese, P.M.,** and Tankersley, R.A. pH factors affecting the embryonic development, hatching success and larval morphology in the Florida stone crab. Benthic Ecology Meeting. 2013.
- Gravinese, P.M.,** and Tankersley, R.A. Effects of ocean acidification on embryonic development and larval morphology in the Florida Stone crab. Ocean Sciences Meeting, ASLO. 2013.
- Gravinese, P.M.** Boleman, C.L., Muse, E., and Marston, A. Corals on Acid: Inquiry-based Ocean Acidification Lesson Plans. Ocean Sciences Meeting, ASLO 2012.
- Gravinese, P.M.,** Kronstadt, S., Cohen, P., Ferro, M., Tankersley, R.A., and Windsor, J.W. Putting

Science into Motion: Illustrating Science Concepts Using Animations. Florida Marine Science Educator Association and NSF–GK 12 Conference 2012.

**Gravinese, P.M.** and Tankersley, R.A. Feeling the Pressure: Depth Regulation by the larvae of the Stone Crab, *Menippe mercenaria*. Larval Biology Meeting September 2006, ASLO March 2006.

**Gravinese, P.M.** and Tankersley, R.A. Depth regulation in stone crab larvae: behavioral responses to hydrostatic pressure. Benthic Ecology Meeting, January 2006.

**Gravinese, P.M.** and Tankersley, R.A. The cost of delayed metamorphosis in the blue crab, *Callinectes sapidus*. TriBeta Southeastern District Convention and Benthic Ecology Meeting, 2003.

### **Graduate Committees**

- Michael Giglotti: Ph.D (2019–*present*). student, Florida Institute of Technology funded by a Mote Graduate Student Fellowship to determine the tolerance and physiological response to temperature and hypoxia among juvenile stone crabs, *Ongoing, will be submitted to Journal of Experimental Biology*.

### **Advising and Mentoring Undergraduates**

#### **Mentees at Mote Marine Laboratory (2017–2020)**

- Shelby Perry: B.S., in Biology from the University of Alabama, Mote REU intern (2019–2020), determining the effects of elevated temperature and  $p\text{CO}_2$  on the Caribbean King crab *in preparation for publication in ICES Journal of Marine Science*.
- Mary Kate Munley: undergraduate B.S. student, University of New Hampshire, NSF REU intern at Mote Marine Laboratory (2019), determining the effects of moderate and severe hypoxia and red tide on sublegal stone crabs *in review in Harmful Algae*.
- Christopher Ng: undergraduate B.S. student, Brown University, Mote Marine Laboratory REU intern determining the effects of moderate and severe hypoxia and red tide on sublegal stone crabs.
- Alex Douwes: B.S. in Marine Biology from University of Delaware, Mote REU intern (2019–2020), The tolerance of coastal corals to hypoxia and their ability to recover. *ongoing, will be submitted to Coral Reefs*.
- Emma Saso: B.S. in Biology from Pitzer College, NSF REU intern at Mote Marine Laboratory (2018), **co-author** on published manuscript in [Harmful Algae](#).
- Sam Fisher, B.S. in Biology from St. Petersburg College, Mote Intern (2018–2019), determined the effects of ocean acidification on post-larval spiny lobster orientation to settlement cues, *in preparation for Scientific Reports*.
- Tessa Parker, B.A. in Liberal Arts from Wyoming Catholic College, Mote Intern (2018–2019), conducted an experiment to determine the tolerance of sublegal stone crabs to natural variations in red tide, *in preparation for Harmful Algae*.
- Christina Pipkin, undergraduate B.S. student, at Duke University, Mote Intern (2018), conducted an experiment to compare the cost of delayed metamorphosis on post-larval blue and stone crabs, *in preparation for Marine Behavioral Physiology*.
- Harrison Mancke: undergraduate B.S. student, Florida International University, Mote Intern (2018), conducted an experiment on juvenile stone crab habitat selection, *in preparation for Journal of Crustacean Biology*.
- Cody Cole: B.S., University of South Florida, served as my intern at Mote Marine Laboratory (2017–2018), assisted in experiments to determine the 1) impact of hypoxia and elevated temperature on stone crab foraging behavior (*ongoing*), and 2) **co-author** on manuscript that determined the impacts of red tide exposure on stone crab tolerance, published in [Marine and Environmental Research](#). Current technician for the Mote Marine Laboratory Phytoplankton Ecology Program.
- Talib Clemente, B.S., Life University, Mote Intern (2017–2018), **co-author** on manuscript that determined the impacts of red tide exposure on stone crab tolerance, published in [Marine and Environmental Research](#), current Animal Care Specialist, Six Flags Discovery Kingdom.



- Brittney Thompson: B.S. in Environmental Studies from Cornell University, Nature Conservancy Leaders in Environmental Action for the Future Fellowship (2017), assisted in field collection of juvenile stone crabs for hypoxia tolerance experiments.

#### Mentees during graduate school (2013–2016)

- Tessa Gonzalez: B.S. from University of Miami, advised during her International Seakeepers Society internship (2016), current graduate student in Environmental Law at the University of Vermont
- Allie Folick: current Ph.D. student Texas A & M, served as an undergraduate intern during my Ph.D.
- Amanda Appelson: Studied Marine Affairs at University of Miami. Advised while an educator for Broadreach, Bermuda Institute of Ocean Sciences REU in 2014
- Kelly McCaffrey: Aquatic Toxicology Research Associate for the EPA, received her M.S., Florida Institute of Technology, served as my intern during my Ph.D., and I mentored her during her internship at Mote Marine Laboratory in 2013

#### **Research Featured in Local Press**

- New York Times: <https://www.nytimes.com/2018/12/16/us/stone-crabs-florida-algae-red-tide.html>
- Spectrum Bay News 9: <https://www.baynews9.com/fl/tampa/news/2018/10/16/red-tide-a--one-two--punch-as-stone-crab-season-opens#>
- Boca Beacon: <http://bocabeacon.com/news/as-stone-crab-season-begins-many-wonder-are-those-crabs-safe-to-eat/>
- Herald Tribune: <https://www.heraldtribune.com/news/20181025/red-tide-warm-water-slows-stone-crab-harvest>
- The Islander: <https://www.islander.org/2018/10/cortez-stone-crabbers-face-uncertain-future/>
- Suncoast News Network TV: <http://www.sntv.com/2018/04/30/new-research-mote-reveals-stone-crabs-feel-effects-red-tide/>
- Daytona Beach News : <https://www.news-journalonline.com/news/20180609/sarasota-lab-finds-red-tide-imperils-stone-crabs>
- Accu Weather: <https://www.accuweather.com/en/videos/environmental-factors-affecting-stone-crabs/f4y3h5zte6ykeww27dyin1hdeqwdp466>
- Fox News TV: <http://www.fox13news.com/news/local-news/stone-crabs-elude-fishermen-driving-up-prices>
- Bradenton Herald: <http://www.bradenton.com/news/local/article202358589.html>
- Herald Tribune: <http://www.heraldtribune.com/news/20180227/love-your-stone-crabs-ocean-acidification-is-threatening-them>

#### **Synergistic Activities and Outreach**

##### Marine Science through Videography

1. [Youth Making Ripples Film Festival and Competition](#), Co-founder (2012–present), Educational non-profit and national program that challenges K–12 students to create short marine conservation documentaries
2. Beneath the Waves™, Inc., Educational Outreach Associate (2012–2017)
  - engaging the public about marine science through film and research
  - Co-writer, director, and producer of educational film "[A Mucky Future for the Indian River Lagoon](#)", screened at the 2013 Beneath the Waves Film Festival in Savannah, Georgia and a Beneath the Waves mini-festival in Faro, Portugal

##### Other Outreach

Mote Marine Laboratory High School Intern Mentor (2018–present)

Mote Marine Laboratory Science Café lecturer (2017–present)

Mote Marine Laboratory, Research Experience for Undergraduate Lecture Series, “*How to give an effective scientific presentation*” (2017–present)

Middle and high school science fair mentor, Brevard and Sarasota County Schools (2009–2012)

“Lunch with a Scientist” middle school program, Florida Institute of Technology, (2012–2013)

### **Scholarships**

Florida Institute of Technology Teaching Assistantship – \$2,482 (Fall 2016)  
Florida Institute of Technology Research Assistantship – \$5,445 (Summer 2016)  
Florida Institute of Technology Doctoral Graduate Research Assistantship – \$10,458 (2014)  
Florida Institute of Technology Ambassador Scholarship – \$1,000 (2013–2014)  
University of Washington Friday Harbor Marine Science Scholarship – \$1,500 (2013)

### **Awards and Honors**

Florida Marine Science Educator Association Award (2017)  
Outstanding Graduate Student Marine Biology (2011–2012, 2013–2014)  
Florida Tech ‘Open Access Essay’ Award (2013)  
Florida Marine Science Educator Association Travel Award (2013)  
Florida Marine Science Educator Association – John Beakley Educator of the Year Award (2011)  
Presidential Award for Excellence in Mathematics and Science Teaching Nominee (2010)  
Space Coast Science Education Alliance Exemplary Teacher (2009–2010)  
Space Coast Science Education Alliance Exemplary Teacher Nominee (2006–2007)  
Outstanding Graduate Student Marine Biology (2003–2004, 2005–2006)

### **Special Programs, Committee Participation and Professional Organizations**

International Coral Reef Society (2020–present)  
State of Florida Stone Crab Advisory Panel (2017–present)  
Advisory Committee, MacArthur Beach State Park Citizen Stewards Program (2017–present)  
Educational Advisory Board Council, ANGAGI Foundation, (2017–2019)  
President, Biology Graduate Student Association, Florida Institute of Technology (2013–2016)  
National Ocean Science Bowl Question Writer (2015)  
Brevard County Science Fair Judge (2009–2015)  
Blue Life Organization, Wonders of Water: Conservation Program Speaker (2012–2014)  
Ocean Science Bowl Coach, West Melbourne School for the Sciences (2011–2012)  
Vice-President, TriBeta Biological Honor Society, Florida Institute of Technology (2002–2003)  
Rowing Coach, Sebastian River and Vero Beach High Schools (2010–2016)

### **Professional Development Training**

Ocean Acidification Round Table Workshop, Mote Marine Laboratory (2012, 2015)  
Consortium for Ocean Science Exploration and Engagement Presentation and Video Story Telling Bootcamps (2015)  
Ocean Acidification Research Apprenticeship, University of Washington (2013)  
Computing for Data Analysis in R Programming, John Hopkins (2013)  
NSF Broader Impact Workshop, University of South Florida (2012)  
Consortium for Ocean Science Exploration and Engagement Presentation Bootcamp, Naples, FL (2012)  
NSF Ethics Training, (2011)