

# Matthew J. Garrett

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## EDUCATION

- 2015 **M.S. Biological Oceanography**, University of South Florida, St. Petersburg, FL
- 2003 **B.S. Marine Science**, Eckerd College, St. Petersburg, FL

## PROFESSIONAL EXPERIENCE

- 2016-present Assistant Research Scientist, Florida Fish and Wildlife Conservation Commission/ Fish and Wildlife Research Institute, Harmful Algal Bloom Group, St. Petersburg, FL
- 2017-present Institute Watercraft Safety Officer, Florida Fish and Wildlife Conservation Commission/ Fish and Wildlife Research Institute, St. Petersburg, FL
- 2011-2016 Research Associate, Florida Fish and Wildlife Conservation Commission/ Fish and Wildlife Research Institute, Harmful Algal Bloom Group, St. Petersburg, FL
- 2009-2011 Research Assistant, Florida Fish and Wildlife Conservation Commission/ Fish and Wildlife Research Institute, Harmful Algal Bloom Group, St. Petersburg, FL
- 2007-2009 Research Assistant, Florida Institute of Oceanography, St. Petersburg, FL
- 2003-2007 Biological Scientist I, Florida Fish and Wildlife Conservation Commission/ Fish and Wildlife Research Institute, Harmful Algal Bloom Group, St. Petersburg, FL
- 1999-2002 Volunteer, Intern, Lab Assistant, Florida Fish and Wildlife Conservation Commission/ Fish and Wildlife Research Institute Marine Mammal Pathobiology Laboratory, St. Petersburg, FL

## PRIMARY RESEARCH EXPERIENCE

### **State HAB Monitoring Program (2003 – present)**

Coordination, planning, and execution of field efforts both offshore and nearshore during red tide event responses and for routine monitoring as part of the FWC-HAB Program. Routine captaining vessel of various sizes, deployment/retrieval of instruments, water collection/filtration/analysis, identification of HABs, design and implementation collaborative studies, and laboratory oversight.

### **ECOHAB *Karenia*: Nutrient Dynamics in the Eastern Gulf of Mexico (2006 – 2012)**

Lead researcher for vertical migration experiments examining the migratory behavior of *K. brevis*; Lead researcher long-term photochemical production experiments quantifying the photoproduction of various nutrients from organic compounds; chief technician for Lachat QuickQem 8500 nutrient autoanalyzer; Chief Scientist for multiple annual 14-day research cruises aboard the RV Pelican; creator and maintainer of project website and Facebook page; isolate and maintain various HAB species in culture for project experiments; management of project logistics and budget.

### **Deepwater Horizon Oil Spill Response (2010 – 2014)**

Research diving to investigate reports of submerged oil off Pinellas County (May 2010); oil and water sampling in response to reports of sub-surface oil offshore Pensacola (June 2010); and research cruises in

conjunction with the University of South Florida aboard RV Weatherbird II (Dec 2010, Jan, Feb, May, Sept 2011, Aug 2012, Feb 2013). Research cruises involve multiple CTD casts, deployment of a multicore, and water filtration for water chemistries.

#### **Ballast Water Program (2003 – 2006)**

Routine sampling of ballast water of foreign vessels visiting the Port of Tampa and Port Manatee for the presence of non-indigenous harmful microalgae and their resting stages. Cysts were isolated, photographed, identified, and incubated to determine viability. Excysted cells were established into culture, reexamined via electron microscopy and tested for toxin production.

### **PUBLICATIONS**

- M. Garrett**, K. Daly, G. Hitchcock, M. Luther. 2019. Influences of water stratification and nutrient gradients on the migratory behavior of the red tide dinoflagellate, *Karenia brevis*. In prep.
- R. Weisberg, Y. Liu, C. Lembke, C. Hu, K. Hubbard, **M. Garrett**. 2019. The Coastal Ocean Circulation Influence on the 2018 West Florida Shelf *K. brevis* Red Tide Bloom. Journal of Geophysical Research: Oceans <https://doi.org/10.1029/2018JC014887>
- M. Garrett**, C. Puchlutegui, A. Selwood, J. Wolny. 2014. Identification of the harmful dinoflagellate *Vulcanodinium rugosum* recovered from the ballast tank of a globally travelled ship in Port Tampa Bay, Florida, USA. Harmful Algae 39 : 202-209.
- C. Heil, D. Bronk, L. Dixon, G. Hitchcock, G. Kirkpatrick, M. Mulholland, J. O'Neil, J. Walsh, R. Weisberg and **M. Garrett**. 2014. The Gulf of Mexico ECOHAB: *Karenia* Program 2006-2012. Harmful Algae 38: 3-7.
- M. Mulholland, P. Bernhardt, I. Ozman, L. Procise, **M. Garrett**, J. O'Neil, C. Heil, D. Bronk. 2014. Contribution of diazotrophy to nitrogen inputs supporting *Karenia brevis* blooms in the Gulf of Mexico. Harmful Algae 38: 20-29.
- L. Killberg-Thoreson, R. Sipler, C. Heil, **M. Garrett**, Q. Roberts and D. Bronk. Nutrients released from decaying fish support microbial growth in the eastern Gulf of Mexico. 2014. Harmful Algae 38: 40 - 49. DOI: 10.1016/j.hal.2014.04.006
- D. Bronk, L. Killberg-Thoreson, M. Mulholland, R. Sipler, Q. Roberts, P. Bernhardt, **M. Garrett**, J. O'Neil and C. Heil. Nitrogen uptake and regeneration (ammonium regeneration, nitrification and photoproduction) in waters of the west Florida shelf prone to blooms of *Karenia brevis*. 2014. Harmful Algae 38: 50 - 62. DOI: 10.1016/j.hal.2014.04.007
- C. Heil, L. Dixon, E. Hall, **M. Garrett**, J. Lenos, J. O'Neil, B. Walsh, D. Bronk, L. Killberg-Thorsen, G. Hitchcock, K. Meyer, M. Mulholland, L. Procise, G. Kirkpatrick, J. Walsh and R. Weisberg. 2014. Blooms of *Karenia brevis* (Davis) G. Hansen & Ø Moestrup on the West Florida Shelf: Nutrient sources and potential management strategies based on a multi-year regional study. Harmful Algae 38: 127 - 140.
- N. Sheridan, D. Fautin, **M. Garrett**. Gametogenesis and reproduction periodicity of the giant Caribbean sea anemone, *Condylactis gigantean*, in Florida. Invertebrate Biology 134: 116 – 128.
- M. Garrett**, J. Wolny, B. Williams, M. Dirks, J. Brame, and R. Richardson. 2011. Methods for sampling and analysis of marine microalgae in ship ballast tanks: a case study from Tampa Bay, Florida, USA. Algae 26(2) 1-12.
- M. Garrett**, J. Wolny, E. Truby, C. Heil, and C. Kovach. 2010. Harmful algal bloom species and phosphate-processing effluent: Field and laboratory studies. Marine Pollution Bulletin. 62: 596-601.

Tiffany, M., J. Wolny, **M. Garrett**, K. Steidinger and S. Hurlbert. 2007. Dramatic blooms of *Prymnesium* sp. (Prymnesiophyceae) and *Alexandrium margalefii* (Dinophyceae) in the Salton Sea, California. *Lakes and Reservoir Management*. 23: 620-629.

### **PRESENTATIONS**

**M. Garrett**, G. Hitchcock. 2013. Stratification influences on the migratory behavior of the harmful algae *Karenia brevis*. 7<sup>th</sup> Symposium on Harmful Algal Blooms in the US. Sarasota, FL.

**M. Garrett**, S. Murasko, A. Yunker, D. Bronk, L. Killber-Thoreson, C. Heil. 2012. Photochemical production of bioavailable nitrogen as a source for *Karenia brevis* blooms on the West Florida Shelf. 7<sup>th</sup> Symposium on Harmful Algal Blooms in the US. Austin, TX.

**M. Garrett**, S. Murasko, A. Yunker, C. Heil. 2011. Annual Photochemical Nutrient Production in Southwest Florida. Old Dominion University, Norfolk, VA: Annual ECOHAB *Karenia* project meeting.

**M. Garrett**, G. Hitchcock, C. Heil. 2011. Investigations into *K. brevis* Vertical Migration Behavior. Old Dominion University, Norfolk, VA: Annual ECOHAB *Karenia* project meeting.

**M. Garrett**, A. Yunker, S. Murasko, C. Heil. 2010. Annual Photochemical Nutrient Production in Three Coastal Ecosystems in Southwest Florida. Fish and Wildlife Research Institute, St. Petersburg, FL: Annual ECOHAB *Karenia* project meeting.

Haywood, A.J., C.A. Scholin, R. Marin III, K. Petrik, R. Pigg, **M. Garrett**, K. A. Steidinger, and C. Heil. 2009. Detection of *Karenia brevis* in Florida coastal waters using sandwich hybridization assays in two formats. p 95-100. In: Proceedings of the 6th International Conference on Molluscan Shellfish Safety. Royal Society of New Zealand Miscellaneous Series 71. Blenheim, Marlborough, New Zealand. 355 pp.

**M. Garrett**, C. Heil, B. Richardson, D. Bronk, K. Dixon, G. Hitchcock, G. Kirkpatrick, M. Mulholland, J. O'Neil, J. Walsh, R. Weisberg. 2007. ECOHAB: *Karenia* nutrient dynamics in the eastern Gulf of Mexico: A multi-collaborator red tide study. Gulf of Mexico Alliance Nutrients Criteria Conference, Gulf Breeze, Florida. 16-18 January 2007.

**M. Garrett**, B. Richardson, J. Wolny, K. Steidinger, J. D'Urso, M. Dirks, J. Williams. 2006. Potential harmful algae in Tampa Bay (USA): Ballast water investigations using a dinoflagellate model. 14<sup>th</sup> International Conference on Aquatic Invasive Species, Key Biscayne, Florida. 14-18 May 2006.

Wolny, J., **M. Garrett**, K. Steidinger. 2006. Do you know this dinoflagellate? 12<sup>th</sup> International Conference on Harmful Algae, Copenhagen, Denmark. 4-8 September 2006.

### **OTHER RESEARCH ACTIVITIES AND EXPERIENCE**

#### **SPATT Pilot Program for Monitoring *Karenia brevis* Blooms in FL (2017-present)**

Lead investigator and development of SPATT technologies for tracking low-level concentrations of the red tide organism, including laboratory research and proof of concept and creation of coastal and offshore deployment systems.

#### ***Karenia brevis* Event Responses Cruises (2014, 2016)**

Chief Scientist for multi-day cruises aboard RV Bellows to investigate spatial extent and composition of *Karenia brevis* blooms along the SWFL coast.

**Assessing the geographic variability of *Pyrodinium bahamense* (2006)**

Collection of water and sediments from the northern coast of Jamaica and in the Golfo de Nicoya, Costa Rica for geographic population variability research using genetic micro-satellite tests

**Florida Keys (Nov 2004, May 2005)**

Research into the identification, isolation, and culturing of new and cosmopolitan tropical/ semi-tropical HAB species.

**Monitoring and Event Response of Harmful Algal Blooms (MERHAB) Project (2004-2006)**

Research cruises aboard RV Suncoaster investigating composition of *Karenia brevis* blooms and deployment of new sampling and sensing technologies.

**Benthic Mortality Response (2005)**

Rapid response cruise aboard the RV Bellows in response to hypoxic/anoxic benthic mortality resulting from a prolonged *K. brevis* bloom.

**Marine Mammal Experience**

Frequently assist in manatee captures and rescues. Assist with marine mammal necropsies including manatees, whales, dolphins, and sea lion, particularly during mass mortality events. Possess a fundamental knowledge of marine mammal anatomy and necropsy techniques with experience in handling large endangered wildlife.

**AAUS Certified Research Diver**

Scientific diving (100+ dives) for various projects including technical and blue water dives for instrument deployment and retrieval, seagrass restoration, fish surveys, and equipment salvage.

**Aerial Surveys**

Conducted surveys from small fixed wing aircraft (30+ hours) in response to large algal blooms and assistance in the 2011, 2012, and 2016 manatee synoptic surveys.

**TRAINING AND CERTIFICATIONS**

AAUS Diver, CPR, First Aid, O<sub>2</sub> Administration, HAZWOPR, Radiation Safety, USCG Boating Skills and Seamanship, FWC Aerial Survey training.

**INTEGRATIVE ACTIVITIES AND AWARDS**

**Invited speaker: Eckerd College Marine Science Seminar (2014)**

Lectured an undergraduate class on the Harmful Algal Bloom program at FWRI. Material covered included information on the group and the many projects within.

**Invited speaker: Ringling College of Art and Design (2011, 2012)**

Lectured an undergraduate class on the Deepwater Horizon Oil Spill. Material covered included event history, current findings, and personal experiences.

**Awards**

Fish and Wildlife Research Institute, Cooperative Science Award (2018)

Outstanding cooperative science efforts between sections/groups, and developing new partnerships outside of the institute

Fish and Wildlife Research Institute, Safety Award (2018)

Positively influenced safe operations at FWRI

Fish and Wildlife Research Institute, Crisis Response Team Award (2018)  
Coordination, and field and laboratory activities in response to the 2017-2018 red tide event.

Fish and Wildlife Research Institute, Excellence in Science Award (2011)  
Outstanding contribution to the scientific programs of the FWC -FWRI

Fish and Wildlife Research Institute, Crisis Response Team Award (2010)  
Field and laboratory activities in response to the Deepwater Horizon Oil Spill.

Fish and Wildlife Research Institute, Crisis Response Team Award (2010)  
Laboratory assistance in response to cold weather manatee mortality event.

Fish and Wildlife Research Institute, Crisis Response Team Award (2006)  
Coordination, and field and laboratory activities in response to the 2005-2006 eastern Gulf of Mexico red tide and anoxia event.

Florida Marine Research Institute, Crisis Response Team Award (2004)  
Laboratory assistance in response to red tide manatee mortality event.

### **REFERENCES**

**Dr. Leanne Flewelling**

Research Administrator II, Florida Fish and Wildlife Conservation Commission, St. Petersburg, FL

**Dr. Cynthia Heil**

Director, Mote Red Tide Research Institute, Sarasota, FL

**Dr. Karen Steidinger**

Harmful Algal Specialist, Florida Institute of Oceanography, St. Petersburg, FL