

Kyle A. Capistrant-Fossa

EDUCATION

The University of Texas

Port Aransas, TX

Ph.D. in Marine Science, Advisor: Dr. Ken Dunton

2020–Current

- Dissertation: “Past, Present, & Future Trends of Texas’ Seagrass Meadows as Blue Carbon Sinks”

The University of Maine

Orono, ME

M.S. in Marine Biology

2018–2019

- Thesis: “Stress Tolerance of an Invasive Alga, *Grateloupia turuturu*, and Studies of Bacterial Communities of *Fucus* spp. along an Intertidal Stress Gradient”

The University of Maine

Orono, ME

B.S. in Marine Sciences (Marine Biology concentration) *summa cum laude*

2015–2017

- Thesis (Highest Honors): “Meeting the Challenges of Sea Vegetable Aquaculture in Maine”

PROFESSIONAL EXPERIENCE

Marine Science Institute (UT)

Port Aransas, Texas

Graduate Research Assistant

2020 - 2025

- I am interested in the relationship between seagrass productivity and environmental factors along Texas’ coast. First, I am evaluating the effectiveness of novel active acoustic monitoring and rarely used infrared gas analysis as measures of seagrass stress and productivity. Second, I am leveraging a decade of seagrass monitoring data to infer possible climatic or anthropogenic drivers of changes in seagrass communities. Finally, I am investigating the drivers of long-term carbon sequestration and measure carbon stocks within seagrass meadows.

School of Marine Sciences (UMaine)

Orono, Maine

Temporary Research Scientist

2019 - 2020

- I led analysis of microbial communities of *Fucus* and *Porphyra* spp. collected across the North Atlantic in multiple seasons and years.

Brawley Lab (UMaine)

Orono, Maine

Graduate Research Assistant

2018 - 2019

- My master’s research had two important components related to stress tolerance. First, I discovered the invasive species *Grateloupia turuturu* in Maine and tested biosecurity protocols intended to prevent marine bioinvasions. I found that improper treatment increases establishment potential by creating unexpected growth by fragmentation. Second, I investigated how the bacterial communities of *Fucus* spp. varied along an intertidal stress gradient. This work combined a natural survey of bacterial communities with a manipulative field experiment.

Karp-Boss Lab (UMaine)

Orono, ME

Student Laboratory Aide

2016 - 2017

- I was responsible for sorting images of phytoplankton generated from cruises. Data were used to determine phytoplankton distributions as part of the TARA transoceanic biodiversity project.

Brawley Lab (UMaine)

Orono, ME

Student Laboratory Aide

2015 - 2017

- I worked for two years as an undergraduate laboratory aide in the Brawley Lab. I analyzed data generated from projects, maintained algal cultures, and helped maintain the lab. My undergraduate honors thesis was composed of three projects that I worked on independently: 1) Establishing cultures of wild algae, 2) Testing existing procedures for control of ciliates in algal cultures, and 3) Devising new experimental methods for ciliate control.

PEER-REVIEWED PUBLICATIONS

- Capistrant-Fossa, K.,** & Dunton, K. (2024). Infrared gas analysis as a method of measuring seagrass photosynthetic rate in the face of desiccation stress [**In Review**]. *PeerJ*.
<https://doi.org/10.1101/2024.01.16.575902>
- Capistrant-Fossa, K. A.,** & Dunton, K. H. (2024). Rapid sea level rise causes loss of seagrass meadows. *Communications Earth & Environment*, 5(1), 87. <https://doi.org/10.1038/s43247-024-01236-7>
- Capistrant-Fossa, K. A.,** Morrison, H. G., Engelen, A. H., Quigley, C. T., Morozov, A., Serrão, E. A., Brodie, J., Gachon, C. M. M., Badis, Y., Johnson, L. E., Hoarau, G., Abreu, M. H., Tester, P. A., Stearns, L. A., & Brawley, S. H. (2021). The microbiome of the habitat-forming brown alga *Fucus vesiculosus* (Phaeophyceae) has similar cross-atlantic structure that reflects past and present drivers¹. *Journal of Phycology*, 57(6), 1681–1689. <https://doi.org/10.1111/jpy.13194>
- Bricknell, I., Birkel, S., Brawley, S., Van Kirk, T., Hamlin, H., **Capistrant-Fossa, K.,** Huguenard, K., Van Walsum, G., Liu, Z., Zhu, L., Grebe, G., Taccardi, E., Miller, M., Preziosi, B., Duffy, K., Byron, C., Quigley, C., Bowden, T., Brady, D., ... Moeykens, S. (2020). Resilience of cold water aquaculture: A review of likely scenarios as climate changes in the Gulf of Maine. *Rev. Aquac.*
<https://doi.org/10.1111/raq.12483>
- Quigley, C. T. C., **Capistrant-Fossa, K. A.,** Morrison, H. G., Johnson, L. E., Morozov, A., Hertzberg, V. S., & Brawley, S. H. (2020). Bacterial communities show algal host (*Fucus* spp.)/zone differentiation across the stress gradient of the intertidal zone [**Note: shared first authorship**]. *Front. Microbiol.*, 11. <https://doi.org/10.3389/fmicb.2020.563118>
- Capistrant-Fossa, K.,** & Brawley, S. (2019). Unexpected reproductive traits of *Grateloupia turuturu* revealed by its resistance to bleach-based biosecurity protocols. *Bot. Mar.*, 62(2).
<https://doi.org/10.1515/bot-2018-0104>

FUNDING

- | | |
|--|-------------|
| • Coastal Bend and Bays Estuaries Program, Co-Investigator
<i>Seagrass Assessment in Baffin Bay, Corpus Christi Bay, and Upper Laguna Madre (\$43,000)</i> | 2023 - 2024 |
| • National Center for Coastal Ocean Sciences, Scientist
<i>Acoustic Tracking of Fish Movements to Support Habitat Management (\$100,000)</i> | 2022 - 2024 |
| • Texas General Land Office, Co-Investigator
<i>Assessment of Seagrass Habitat and Stability in Texas Coastal Waters (\$500,000)</i> | 2022 - 2024 |
| • Coastal Bend and Bays Estuaries Program, Co-Investigator
<i>Seagrass Assessment in Baffin Bay, Corpus Christi Bay, and Upper Laguna Madre (\$43,000)</i> | 2022 - 2023 |

TEACHING

- | | |
|--|-------------|
| • Teaching Assistant at The University of Texas
<i>Estuarine Ecology (MNS 352)</i> | Spring 2022 |
| • Teaching Assistant at The University of Texas
<i>Field Methods in Marine Ecology (MNS 120L)</i> | Spring 2021 |
| • Teaching Assistant at The University of Texas
<i>Marine Ecology (MNS 320)</i> | Fall 2020 |
| • Teaching Assistant at The University of Maine
<i>Marine and Freshwater Algae (SMS 373)</i> | Spring 2020 |
| • Tutor at The University of Maine
<i>School of Marine Sciences (BIO 100, CHY 122, SMS 100, 201)</i> | 2015 - 2017 |

TECHNICAL PUBLICATIONS AND DATASETS

1. **K.A. Capistrant-Fossa** & K.H. Dunton (2024). Seagrass Survival in Super Salty Laguna Madre [Data Nugget]. The University of Texas at Austin. **In Review**
2. **K.A. Capistrant-Fossa**, B.E. Batterton, & K.H. Dunton. (2024). Submerged Aquatic Vegetation, Marshes, and Mangroves. In P. A. Montagna & A. R. Douglas (Eds.), Freshwater Inflows to Texas Bays and Estuaries: A Regional-scale Review, Synthesis, and Recommendations. **In Press**
3. **K.A. Capistrant-Fossa** & K.H. Dunton (2024). Seagrass Carbon Assimilation and Desiccation Rates and Chlorophyll Fluorescence Parameters [Data set]. The University of Texas at Austin. <https://doi.org/10.5281/zenodo.10475718>
4. **K.A. Capistrant-Fossa** & K.H. Dunton (2023). Algal Epiphyte Biomass from Seagrass Tissue Along the South Texas Coast (2011 - 2021)[Data set]. The University of Texas at Austin. <https://doi.org/10.5281/zenodo.10198512>
5. K.H. Dunton, K. Jackson, S. Schonberg, & **K.A. Capistrant-Fossa**. (2023). Seagrass density and biomass, water depth, dissolved oxygen, ammonium, dissolved inorganic nitrogen, suspended solids, water temperature, salinity, irradiance, pH in Laguna Madre Texas from 1989-03-24 to 2022-06-23 (NCEI Accession 0282643). NOAA National Centers for Environmental Information. Dataset. <https://doi.org/10.25921/w3c1-sx54>
6. **K.A. Capistrant-Fossa**, S.A. Tapia, and K.H. Dunton. (2023). A Long-Term Seagrass Monitoring Program for Corpus Christi Bay, Upper Laguna Madre and Baffin Bay. Final report to Coastal Bend Bays & Estuaries Program, Publication # 162
7. **K.A. Capistrant-Fossa**, S.A. Tapia, and K.H. Dunton. (2022). A Long-Term Seagrass Monitoring Program for Corpus Christi Bay, Upper Laguna Madre and Baffin Bay. Final report to Coastal Bend Bays & Estuaries Program, Publication # 155
8. **K.A. Capistrant-Fossa**, J Robidoux, D Morse, & S.H. Brawley. (2018). *Grateloupia* Fact Sheet. Maine Sea Grant. <https://seagrant.umaine.edu/wp-content/uploads/sites/467/2019/05/2018-grateloupia-fact-sheet.pdf>

MENTORING & SUPERVISION

- | | |
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| • Monroe Person
<i>Research Assistant</i> | 2023 - 2024 |
| • Anastasia Canu
<i>Research Assistant</i> | 2023 - 2024 |
| • J. Reid Fischer
<i>Undergraduate semester by the sea student. Project: Infrared gas analysis as a method of measuring seagrass photosynthetic rate.</i> | 2023 |
| • Anna Erftenbeck
<i>Research Assistant</i> | 2022 |
| • Mona Birgisson
<i>Undergraduate</i> | 2021 - 2022 |
| • Mona Birgisson
<i>Undergraduate</i> | 2021 - 2022 |
| • Arden Evans
<i>Undergraduate semester by the sea student. Project: Measuring oxygen production as an indicator of productivity in turtle grass (Thalassia testudinum) at varying light conditions.</i> | 2021 |
| • Evan Dunn
<i>Undergraduate</i> | 2019 - 2020 |
| • Riley Cummings
<i>Undergraduate</i> | 2019 - 2020 |

- **Margaret Aydlett** 2019
Undergraduate Honor's Thesis (UMaine),
- **Sydney McDermott** 2018
Undergraduate
- **Margaret Campbell** 2018
Undergraduate

SCHOLARSHIPS AND AWARDS

- Southern Association of Marine Laboratories Student Support Award 2024
- UT Austin Professional Development Award 2023
- UT Marine Science Institute Student Travel Award 2023
- Gulf Estuarine Research Society Travel Award 2022
- UT Marine Science Institute Student Travel Award 2022
- UT Austin Office of Graduate Research Summer Fellowship 2022
- #TeachAlgae Contest Winner (Phycological Society of America) 2020
- Best Graduate Student Presentation with Maine Sea Grant Support 2019
- Best Graduate Student Presentation (Natural Sciences) 2019
- Sustainable Ecological Aquaculture Network Graduate Fellowship 2019
- Phycological Society of America Hoshaw Travel Award 2018
- Northeast Algal Society Book Award 2018
- School of Marine Sciences Scholarship 2018
- Research Reinvestment Fund Undergraduate Assistantship 2016
- American Society of Microbiology Student Travel Award 2016

PRESENTATIONS

- [**Capistrant-Fossa** & Dunton] Rapid sea level rise causes loss of seagrass meadows, National Park Service Gulf Coast Inventory and Monitoring Network, 2023.
- [**Capistrant-Fossa** & Dunton] Linking Sea Level Rise with Seagrass Loss: A Case Study in the Western Gulf of Mexico, Coastal Estuarine Research Federation, 2023.
- [Armada Tapia, **Capistrant-Fossa** & Dunton] A first look at seagrass populations in Baffin Bay, a semi-arid estuary in South Texas, Coastal Estuarine Research Federation, 2023.
- [**Capistrant-Fossa** & Dunton] Linking Sea Level Rise with Seagrass Loss: A Case Study in the Western Gulf of Mexico, The University of Texas Marine Science Institute, 2023.
- [Armada Tapia, **Capistrant-Fossa** & Dunton] A first look at seagrass populations in Baffin Bay, a semi-arid estuary in South Texas, The University of Texas Marine Science Institute, 2023.
- [Cushing et al] Using effective medium modeling and additive manufacturing to evaluate acoustic behavior of seagrasses, Underwater Acoustics Conference and Exhibition, 2023.
- [Ballard et al] Acoustical methods for remote sensing in seagrass meadows, Acoustical Society of America, 2023.
- [Jerome et al] Effective medium modeling of acoustic propagation in a seagrass meadow, Acoustical Society of America, 2023.

- [Lee et al] Temporal dependence of acoustic propagation in a seagrass meadow over diurnal and annual timescales, Acoustical Society of America, 2023.
- [Engelen et al] The bacteriome of the genus *Porphyra* in the North-Atlantic across time and space, European Phycological Congress, 2023.
- [**Capistrant-Fossa** et al (delivered by S.H. Brawley)] Zone, species, AND tissue all shape the intertidal macroalgal microbiome, Phycological Society of America, 2023.
- [Dunton & **Capistrant-Fossa**] Texas Seagrass Monitoring Program, Gulf of Mexico Seagrass Monitoring Workgroup, 2022.
- [**Capistrant-Fossa** & Dunton] Seagrass Succession in Super Salty Laguna Madre (TX, USA), Gulf Estuarine Research Society, 2022.
- [Ballard et al] A yearlong record of acoustic propagation and ambient sound in a seagrass meadow, Acoustical Society of America, 2022.
- [**Capistrant-Fossa** & Dunton] Seagrass Succession in Super Salty Laguna Madre (TX, USA), The University of Texas Marine Science Institute, 2022.
- [Cushing et al] Long-term monitoring of seagrass meadows using acoustical methods, Texas Bays and Estuaries Meeting, 2022.
- [**Capistrant-Fossa** & Dunton] Sunlight steers seagrass succession in super salty Laguna Madre (TX, USA), Texas Bays and Estuaries Meeting, 2022.
- [Morrison et al] Analysis of Bacteria Cultivated from the Microbiomes of the Brown Alga *Fucus vesiculosus* (Phaeophyceae) and the Red Alga *Porphyra umbilicalis*, Joint Aquatic Sciences Meeting, 2022.
- [Morrison et al] Identification of latitudinal and tissue-specific amplicon sequence variances of bacteria in host microbiomes of the brown algae *Fucus vesiculosus* (Phaeophyceae), Phycological Society of America, 2021.
- [Engelen et al] *Fucus vesiculosus* associated microbiome differs latitudinally across the hosts' Atlantic Ocean distribution despite strong tissue specificity of communities, Phycological Society of America, 2021.
- [Dunn et al] An Overview of the Algal Collections in the University of Maine Herbarium (MAINE), Phycological Society of America, 2021.
- [**Capistrant-Fossa** & Dunton] Identification of environmental drivers of microbiome structure from the brown alga *Fucus vesiculosus* (Phaeophyceae), Phycological Society of America, 2021.
- [Dunn et al] An Overview of the Algal Collections in the University of Maine Herbarium (MAINE), Northeast Algal Society, 2021.
- [**Capistrant-Fossa** et al] Characterization of microbial communities on natural and transplanted congener macroalgae across the intertidal stress gradient, Ocean Sciences Meeting, 2020.
- [**Capistrant-Fossa** & Brawley] Unexpected reproductive traits of *Grateloupia turuturu* revealed by its resistance to bleach-based biosecurity protocols, University of Maine Student Symposium, 2019.
- [**Capistrant-Fossa** & Brawley] Unexpected reproductive traits of *Grateloupia turuturu* revealed by its resistance to bleach-based biosecurity protocols, Northeast Aquaculture Conference and Exposition, 2019.
- [**Capistrant-Fossa**, Robidoux, & Brawley] Unexpected reproductive traits of *Grateloupia turuturu* revealed by its resistance to bleach-based biosecurity protocols, Maine Marine Invasive Species Collaborative (Maine, 2018).
- [**Capistrant-Fossa** & Brawley] Unexpected reproductive traits of *Grateloupia turuturu* revealed by its resistance to bleach-based biosecurity protocols, Maine Sea Grant Research Symposium (Maine, 2018).
- [**Capistrant-Fossa** & Brawley] Unexpected reproductive traits of *Grateloupia turuturu* revealed by its resistance to bleach-based biosecurity protocols Northeast Algal Society Symposium (Connecticut, 2018).

- [Quigley et al] The microbiome of *Fucus* spp., a suite of ecosystem engineers, Phycological Society of America/International Society of Protistologists, 2018.
- [Capistrant-Fossa & Brawley] The resistance of macroalgae including the invasive red alga *Grateloupia turuturu* (Halymeniales, Rhodophyta) to common biosecurity protocols, Phycological Society of America/International Society of Protistologists, 2018.
- [Capistrant-Fossa & Brawley] Meeting the challenges of sea vegetable aquaculture in Maine, School of Marine Sciences Capstone Symposium, 2017.
- [Capistrant-Fossa & Brawley] Meeting the challenges of sea vegetable aquaculture in Maine, SEAFellows Summer Symposium, 2017.
- [Capistrant-Fossa et al] Determining conditions for best sea vegetable crop production on sea farms in coastal Maine, Annual meeting of the Northeast Algal Society (Massachusetts), 2016.

PROFESSIONAL DEVELOPMENT

- **Teaching Preparation Series Advanced Certificate** at UT Center for Teaching & Learning 2023 - Current
- **Scientific Communication Certificate** at University of Wyoming 2023 - Current
- **Concentration in Teaching and Mentoring** at UT College of Natural Sciences 2022 - Current
- **Inclusive Course Design Institute** at UT Center for Teaching & Learning 2023
- **Inclusive Classrooms Leadership** at UT Division of Diversity and Community Engagement 2022
- **Fundamentals for Teaching Assistants** at UT Center for Teaching & Learning 2023

SERVICE

- **Co-Editor** at CERF's UP! Quarterly Bulletin 2023 - 2025
- **Member** at CERF Publications Committee 2023 - 2025
- **Member** at CERF Communications Task Force 2023
- **Planning Committee** at Texas Bays and Estuaries Meeting 2022 - 2024
- **Webmaster and Data Manager** at Texas Seagrass Monitoring Program 2021 - 2023
- **Graduate Student Associate Recreation Director** at UTMSI 2021 - 2023
- **Judge** at Gulf Estuarine Research Society Undergraduate Poster Session 2022
- **Judge** at University of Texas Marine Science Institute Semester by the Sea Student Symposium 2021
- **Judge** at UMaine School of Marine Sciences Undergraduate Capstone Symposium 2019

OUTREACH

- **Seagrass Monitoring Outreach** at Flour Bluff ISD World Migratory Bird Day Festival 2023
- **K-12 Seagrass Outreach** at Flour Bluff Independent School District 2023
- **K-12 Seagrass Outreach** at Port Aransas Independent School District 2022 - 2023
- **UTMSI Representative** at Port Aransas Whooping Crane Festival 2022
- **8th Grade Science Fair Judge** at Port Aransas Independent School District 2021 - 2022
- **4/5th Grade Science Fair Judge** at Port Aransas Independent School District 2020 - 2022
- **Scientist in Residence** at Port Aransas Independent School District 2020 - 2021
- **Speaker** at Bangor United Technology Center Middle School Career Fair 2019
- **Science Judge** at Northeast Ocean Science Bowl 2018

PEER REVIEW

JGR: Biogeosciences, Journal of Ecology, ALGAE, Estuaries and Coasts, Gulf and Caribbean Research, Regional Studies in Marine Science

PROFESSIONAL SOCIETIES

Phycological Society of America, Coastal & Estuarine Research Federation, Gulf Estuarine Research Society, International Association of Biological Oceanography, Society for Open Reliable Transparent Ecology and Evolutionary Ecology, Ecological Forecasting Initiative