NEW COLLEGE OF FLORIDA

New Degree Program Proposal:
Master's in Marine Mammal Science

Prepared for:

Florida Board of Governors
State University System

FL BOG New Degree Program Proposal

STATE UNIVERSITY SYSTEM OF FLORIDA

State University System of Florida Board of Governors
REQUEST TO OFFER A NEW DEGREE PROGRAM
In accordance with Board of Governors Regulation 8.011
(Please do not revise this proposal format without prior approval from Board staff)

New College of Florida **Institution Submitting Proposal**	**Fall 2024** **Proposed Implementation Term**
New College of Florida **Name of College(s) or School(s)**	**Marine Mammal Science** **Name of Department(s)/Division(s)**
Research Methodology and Quantitative Methods/Marine Mammal Science **Academic Specialty or Field**	**Master's in Marine Mammal Science** **Complete Name of Degree**
45.0102 **Proposed CIP Code (2020 CIP)**	**Proposed Program Type** ☒ **E&G Program** ☐ **Market Tuition Rate Program** ☐ **Self-Supporting Program**

The submission of this proposal constitutes a commitment by the university that, if the proposal is approved, the necessary financial resources and the criteria for establishing new programs have been met before the program's initiation.

2/22/2024 **Date Approved by the University Board of Trustees**	2/27/24 **President's Signature** **Date**
Debra A. Jenks 2/27/24 **Board of Trustees Chair's Signature** **Date**	2/27/24 **Provost's Signature** **Date**

Form Updated March 2023

Projected Enrollments and Program Costs

Provide headcount (HC) and full-time equivalent (FTE) student estimates for Years 1 through 5. HC and FTE estimates should be identical to those in Appendix A – Table 1. Indicate the program costs for the first and the fifth years of implementation as shown in the appropriate columns in Appendix A – Table 3A or 3B. Calculate an Educational and General (E&G) cost per FTE for Years 1 and 5 by dividing the total E&G by FTE.

Implementation Timeframe	HC	FTE	E&G Cost per FTE	E&G Funds	Contract & Grants Funds	Auxiliary/ Philanthropy Funds	Total Cost
Year 1	10	10	$131,192	$1,311,920	$250,000	$100,000	$1,661,920
Year 2	24	24					
Year 3	39	32					
Year 4	48	40					
Year 5	62	50	$29,132	$1,456,590	$750,000	$400,000	$2,606,590

Programs of Strategic Emphasis Waiver *(for baccalaureate programs only)*

Does the program fall under one of the CIP codes listed below?

☐ **Yes**
XX No
If yes, students in the program will be eligible for the Programs of Strategic Emphasis (PSE) waiver. See Board Regulation 7.008 and the PSE Waiver Guidance for additional details.

CIP CODE	CIP TITLE	CATEGORY
11.0101	Computer and Information Sciences	STEM
11.0103	Information Technology	STEM
14.0801	Civil Engineering	STEM
14.0901	Computer Engineering	STEM
14.1001	Electrical and Electronics Engineering	STEM
27.0101	Mathematics	STEM
40.0801	Physics	STEM
52.0301	Accounting	GAP ANALYSIS
52.0801	Finance	GAP ANALYSIS
52.1201	Management Information Systems	STEM

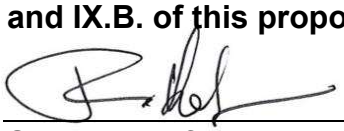
Additional Required Signatures

I confirm that I have reviewed and approved Need and Demand Section III.F. of this proposal.

Signature of Equal Opportunity Officer

February 5, 2024
Date

I confirm that I have reviewed and approved Non-Faculty Resources Section IX.A. and IX.B. of this proposal.



Signature of Library Dean/Director	January 29, 2024 **Date**

Introduction

I. Program Description and Relationship to System-Level Goals

A. Describe within a few paragraphs the proposed program under consideration and its overall purpose, including:

- **degree level(s)**
- **majors, concentrations, tracks, specializations, or areas of emphasis**
- **total number of credit hours**
- **possible career outcomes for each major (provide additional details on meeting workforce need in Section III)**

New College of Florida (NCF) is seeking approval for a Master's degree program in Marine Mammal Science, our second master's program. The Master's in Marine Mammal Science (MIMMS) degree program will be offered on New College of Florida's main campus in Sarasota. This will be a four-semester, two-year graduate program (48 credit hours total, 24 credit hours each year). The master's degree will require a research thesis and be research focused, including experimental design, research methods, and quantitative analysis.

Our goal is to enroll an initial cohort in Fall 2024 of approximately 10 students. By year 5, Fall 2029, the entering cohort is planned to be 35 students. We will substantially increase recruiting efforts in the future to meet this goal. After year 5, the MIMMS degree will be ongoing.

Students trained in this program will have multiple options for next steps after graduation. The skills required to study marine mammals in an interdisciplinary way, the focus of this program, are broadly applicable to advances in science, technology and medicine. Talented New College undergraduates, working toward their New College of Florida B.A. degrees in a liberal arts environment that both challenges and permits them to pursue a highly individualized course of study, have chosen to develop skills in these methodologies and data analyses and have gone on to a wide swath of occupations (e.g., medical doctors, vets, lawyers, statisticians, park rangers, laboratory managers, conservation agency staff, non-profit staff, zoo and aquarium researchers and managers, etc.) after graduation. Today, research skills are as necessary a part of a good education as clear writing and reasoning skills. The MIMMS degree program provides individuals with the post-baccalaureate training needed to pursue careers in research design and data analysis, comparative psychology, conservation biology, ecology, and marine mammal husbandry and training.

B. If the proposed program qualifies as a Program of Strategic Emphasis, as described in the Florida Board of Governors 2025 System Strategic Plan, indicate the category.

- **Critical Workforce**

☐ Education
☐ Health
☐ Gap Analysis

- **Economic Development**
  ☐ Global Competitiveness
  Science, Technology, Engineering, and Math (STEM)

x **Does not qualify as a Program of Strategic Emphasis.**

II. Strategic Plan Alignment, Projected Benefits, and Institutional Mission and Strength

A. Describe how the proposed program directly or indirectly supports the following:

- **System strategic planning goals (see the link to the 2025 System Strategic Plan on the New Program Proposals & Resources webpage)**
- **the institution's mission**
- **the institution's strategic plan**

NCF's proposed MIMMS aligns with the following Florida University System Strategic Planning Goals:

- GOAL: Strengthen Quality and Reputation of the Universities: Improve the quality and relevance of the System's institutions with regard to state, national, and international preeminence.
  - This will be the first master's program in Florida to focus specifically on marine mammal science. This will improve the quality and relevance of Florida public institutions to state and national preeminence.
- GOAL: Increase Research Activity and Attract More External Funding: Increase research activities to help foster entrepreneurial campus cultures. Attract more research funding from external (includes federal and private) sources.
  - Research conducted by graduate students and faculty through the proposed marine mammal science program will immediately be supported in part by grants from the Office of Naval Research and a Human Frontier Science Program award. Future work is expected to attract external funding from these sources and potentially from awards related to Florida agencies, such as the National Oceanic Atmospheric Administration (NOAA) and the Fish and Wildlife Research Institute (FWRI), NSF, and industry support (e.g., zoos/aquariums). Graduate students will be encouraged to be entrepreneurial in searching for external funding.
- GOAL: Increase Levels of Community and Business Engagement: Increase faculty and student involvement in community and business engagement activities.
  - The proposed marine mammal science program will further cement community and business involvement with multiple zoos and aquariums in the state, e.g., Clearwater Aquarium, and other state, national and international research organizations (e.g., FWRI).
- GOAL: Increase Community and Business Workforce: Increase the percentage of graduates who continue their education or are employed full-time.
  - The proposed marine mammal science program will develop internships

and pathways to full-time jobs for its graduates. It will also provide pathways for New College BA earners to pursue further education that will lead to full-time employment.

The New College Mission is:

New College of Florida prepares intellectually curious students for lives of great achievement. It offers a liberal arts education of the highest quality in the context of a small, residential public honors college with a distinctive academic program which develops student intellectual and personal potential as fully as possible; encourages the discovery of new knowledge and values while providing opportunities to acquire established knowledge and values; and fosters the individual's effective relationship with society.

MIMMS aligns with the mission by:

- being of the highest quality,
- being distinctive (unique in the nation),
- fully developing intellectual and personal potential of each graduate student,
- encouraging the discovery of new knowledge through the research thesis, and
- fostering an effective relationship with society through career preparation.

MIMMS directly and indirectly supports the NCF Strategic Plan by contributing to three goals in the Strategic Plan: recruit more students who will thrive at NCF, keep them here for four years, and make their degree more valuable.

1. Recruit more students who will thrive at NCF

    a. Tell the New College Story

        iii. Enhance academic reputation -Promote curriculum and programs of distinction. *MIMMS will be distinctive. It will be the only program in Florida that focuses on marine mammal science. The only comparable program is University of St.- Andrews, in Scotland.*

2. Keep them here for four years

    b. Immerse students in curricula that inspires

        i. Develop attractive programs that are important to Florida. *The science of marine mammals is important to Florida.*

        iii. Engage students in high impact practices - Increase externally-funded faculty research involving students. *Master's students and undergraduates will participate in faculty funded research, a high impact practice.*

3. Make their degree more valuable

        ii. Develop pathways to immediate employment and continuing education

- Enhance career-readiness, continuing education, and post-graduation programming (e.g., What's Next?) with additional pathways and articulation agreements. *MIMMS will enhance career readiness through two classes* - Writing a Journal Article and Agencies: Research, Funding, Logistics, Professional Pathways.
- Develop pathways from NCF to graduate programs. *Biology and Psychology undergraduates will be recruited to be Marine Mammal Science graduate students.*

4. Make Sarasota an educational destination

iii. Collaborate with research, artistic, medical organizations and businesses - Mellon Grant (connect arts and humanities in the local region) -Establish Local Global Center. *Through collaboration with the Sarasota Dolphin Research Program (SDRP), Marine Mammal Science will solidify Sarasota as a research and educational location for marine mammals. (In Spring 2023 NCF & SDRP collaborated with Museum Studies to produce an exhibition supported by Mellon on NCF's campus.)*

iv. Cultivate faculty networks with professional, scientific organizations -Enhance grant activities. *Marine Mammal Science faculty are well networked with professional and scientific networks. They often present their research at national and international conferences. Graduate students will expand the value of these networks by producing new knowledge through research.*

MIMMS builds on a foundation of both undergraduate and faculty research related to marine mammals. This includes faculty in Biology, Marine Biology, Psychology, Biopsychology, Animal Wellbeing and Conservation, and Neuroscience. The core faculty for MIMMS have published research about dolphins, manatees and sea lions, often engaging undergraduates in this research. NCF has a strong working relationship with SDRP, which has the longest running research of a wild dolphin population globally.

B. Describe how the proposed program specifically relates to existing institutional strengths. This can include:

- **existing related academic programs**
- **existing programs of strategic emphasis**
- **institutes and centers**
- **other strengths of the institution**

NCF is the smallest of the twelve universities in the State University System of Florida. The state's designated public honor's college, it serves exceptionally talented students in a residential, liberal arts environment that both challenges and permits students to pursue a highly individualized and interdisciplinary course of study. MIMMS' degree program is the college's second post-baccalaureate degree program. Half of the nation's liberal arts colleges offer highly targeted graduate programs in areas of institutional strength, and this program will be a unique contribution to the U.S.'s offerings.

NCF's unique strengths make Marine Mammal Science a particularly appropriate area for the college to offer as a graduate program on several counts: (1) Current faculty teaching in the B.A. programs are globally recognized for their research focused on marine mammals (manatees, bottlenose dolphins, sea lions). (2) NCF's campus is on Sarasota Bay, the location of the longest studied population of wild dolphins in the world. (3) Florida is home to more manatees than anywhere else. (4) Florida has a large number of zoos and aquariums housing marine mammals. Due to these strengths, the creation of this program has been a goal of New College faculty for a dozen years, and funding is now attainable to make the program a reality.

In combination, Biology, Marine Biology, and Psychology (including Biopsychology, Neuroscience, Animal Wellbeing) produce a disproportionate number of BA degrees at New College, 33% of all BAs in 2023.

Biology, Marine Biology, and Psychology Academic Productivity AY 2022-23

# Course Enrollments 2022-23	# Independent Study Projects 2022-23	# Tutorials 2022-23	# Theses 2022-23	# Theses Collegewide 2022-23
522	70	205	42	127
% of 2023 BA Graduates With Biology and Psychology Faculty members as Thesis Sponsor			33%	

NCF has strong undergraduate programs in Psychology, Biopsychology, Animal Wellbeing and Conservation, Neuroscience, Biology, and Marine Biology. We also have the Pritzker Marine Biology Lab, and a dock with a boat lift on Sarasota Bay. We have the Limbatus, a teaching and research vessel for Sarasota Bay. The waterfront program also offers a rescue boat, numerous sailboats, kayaks, and paddleboards.

Marine Mammal Science will collaborate with Applied Data Science on statistical training for graduate students. In 2023, Fortune Magazine ranked the program #25 in Best Master's in Data Science Programs nationwide. Also in 2023, the Applied Data Science program finalized a grant agreement totaling nearly $100K from the United States Department of Agriculture that will support internships for its students, which marks the second time the USDA has sponsored internships for New College graduate students.

We are concurrently submitting a request to the BOG to establish a state of Florida SUS institute, the *Florida Institute of Marine Mammal Science (FIMMS)*, in which NCF and the Aquatic Animal Health Program in the University of Florida's College of Veterinary Medicine partner to support marine mammal science related to teaching, research, service, and the conservation of marine mammals in Florida.

C. Provide the date the pre-proposal was presented to the Council of Academic Vice Presidents Academic Program Coordination (CAVP ACG). Specify any

concerns raised and provide a narrative explaining how each concern has been or will be addressed.

The pre-proposal was presented to the CAVP ACG on September 13, 2023. Members of the ACG had no formal concerns, although they provided useful feedback that helped shape this proposal including clarifying our reasons for choosing this CIP code. We chose a CIP code highlighting Research Methodology and Quantitative Methods because our interdisciplinary program highlights methodology and analysis across lab and field practices in multiple areas (behavior, ecology, neuroscience, cognition, acoustics) related to marine mammal science. (Review section IV to see how this CIP code integrates curriculum and learning outcomes.) They also suggested that we engage with related programs at other universities and institutions, a suggestion on which we have followed up in multiple ways including conversations with personnel at USF's College of Marine Science, USF Sarasota-Manatee, UF's Aquatic Animal Health Program, Eckerd College, FWRI, US Fish and Wildlife Service (FWS), NOAA, and Florida zoos and aquariums.

D. In the table below provide an overview of the institutional planning and approval process leading up to the submission of this proposal to the Board office. Include a chronology of all activities, providing the names and positions of university personnel and external individuals who participated.

- **If the proposed program is at the bachelor's level, provide the date the program was entered into the APPRiSe system, and, if applicable, provide a narrative responding to any comments received through APPRiSe.**

- **If the proposed program is a doctoral-level program, provide the date(s) of the external consultant's review in the planning table. Include the external consultant's report and the institution's responses to the report as Appendix B.**

Planning Process

The planning process formally began in May of 2023. However, Dr. Harley had been working on creating MIMMS for several years prior to the start of this iteration of planning. In June of 2023, MIMMS was included in NCF's Accountability Plan. In July of 2023, New College prepared and submitted an LBR to support MIMMS. In September of 2023, a pre-proposal was prepared for CAVP review. In December of 2023, we submitted a New Program Proposal to SACSCOC.

Date	Participants	Planning Activity Description
5-17-23	Prov Thiessen, Prof/Dir Harley	Proposal introduced to Interim Provost
5-24-23	Pres Corcoran, Prof/Dir Harley, Director Whittle	Proposal introduced to Interim President
6-23-23	Prov Thiessen, Prof/Dir Harley, Dir Whittle, Dr Lal	Master's in Marine Mammal Science included in NCF Accountability Plan
7-6-23	NCF BOT, VP Kinsley	NCF BOT Approval of LBR for Master's in Marine Mammal Science
9-1-23	Prof/Dir Harley, Dir Whittle, Prov Thiessen, Dr Lal	Pre-proposal submitted to CAVP Academic Working Group
9-13-23	CAVP Academic Working Group, Dr Lal, Prov Thiessen	Discussed preproposal, no concerns
11-9-23	BOG	BOG approves Accountability Plan

E. In the table below, provide a timetable of key events necessary for implementing the proposed program following approval of the program by the Board office or the Board of Governors through to the addition of the program to the State University System Academic Degree Program Inventory.

Events Leading to Implementation

Date	Implementation Activity
9-25-23	NCF Educational Policy Committee discussion and review of MIMMS
11-8-23	Faculty meeting presentation and discussion of MIMMS
12-21-23	Submit New Program Proposal to SACSCOC
2-6-24	Draft full proposal completed, begin discussions with BOG staff, revisions
2-22-24	NCF BOT approves full proposal
2-28-24	Submit full proposal to BOG staff
3-26/27-24	BOG approval of MIMMS
4-2-24	Submit revisions to SACSCOC
7-1-24	MIMMS program opens

Institutional and State-Level Accountability

III. Need and Demand

A. Describe the workforce need for the proposed program. The response should, at a minimum, include the following:

- **current state workforce data as provided by Florida's Department of Economic Opportunity**

Given the interdisciplinary course of study, the proposed MIMMS prepares graduates for a diverse mix of occupations including but not limited to science, policy, research, and education jobs. According to current state workforce data, there is a workforce need for

all occupations directly linked to the program with a projected growth for 2023-2031 ranging from .5% to 36.4%. For example, the 8.6% projected increase in job openings for Natural Sciences Managers indicates a demand for individuals with managerial expertise, making the program beneficial for those aspiring to lead marine mammal research initiatives or conservation projects in the state. Additionally, the 5.5% increase in job openings for Conservation Scientists underscores the importance of preparing professionals who can address the unique challenges of marine conservation in Florida and guide government policy and industry. Furthermore, the significant 36.4% increase in job openings for Statisticians highlights the growing need for data-driven decision-making across all industries, and through the proposed program, graduates will be prepared to address this crucial aspect specifically for marine mammal science including but not limited to analyzing population trends, habitat data, human-animal interactions, human/animal behavior, and other research outcomes.

Overall, considering Florida's reliance on its coastline and the ocean as important contributors driving economic activity, it will be critical for the state to develop and maintain healthy ecosystems and robust marine mammal life. Therefore, this program will prepare graduates for jobs in management, research, conservation, education, and data analysis, related to marine science, likely aligning well with the evolving needs of the workforce in the state and its blue economy.

- **current national workforce data as provided by the U.S. Department of Labor's Bureau of Labor Statistics**

The proposed MIMMS program is well-aligned with the national workforce needs based on the projected percentage increase in job openings from 2022 to 2032. The data indicate a consistent demand for skilled professionals across various fields related to marine mammal science. The 4.80% increase in job openings for Natural Sciences Managers suggests a need for individuals with leadership and organizational skills in marine mammal research and conservation. Additionally, the 3% increase in job openings for Zoologists and Wildlife Biologists underscores the relevance of specialized training in marine mammal science to address the growing demand for experts in the field. The program could cater to the 4.10% increase in job openings for Conservation Scientists, preparing graduates to contribute to marine conservation efforts. Furthermore, the substantial 31.60% increase in job openings for Statisticians highlights the importance of statistical expertise in marine mammal research, emphasizing the program's potential to produce professionals well-equipped to analyze and interpret complex data in this domain.

Overall, the proposed MIMMS program appears to address national workforce needs, providing a comprehensive approach to training professionals who can contribute significantly to the management, research, conservation, and data analysis aspects of marine mammal science in the coming decade.

- **requests for the proposed program from agencies or industries in the university's service area**

We have met with representative agencies, zoos and aquaria, and research organizations to assess the needs of those groups and align our program with those needs. With Florida's extensive coastlines (8,436 miles of shoreline, as calculated by NOAA), marine

mammals are a focus of many groups across sectors. We found a need for marine mammal-oriented employees with interdisciplinary knowledge, strong research skills (quantitative analysis, research design, data collection), and strong communication and professional skills. The proposed MIMMS has been designed to prepare students to meet all of these needs. Specifically, from FWRI we met with Andy Garrett at the Manatee Necropsy Lab and Director Gil McRae. From the NOAA, we have met with Elizabeth Fetherston the Marine Mammal Restoration Coordinator and Laura Engleby the Branch Chief for the Southeast Regional Office Marine Mammal Branch. From the FWS Office, we met with Larry Williams, State Program Supervisor, and Gianfranco Basili, Deputy State Supervisor. On January 31, we met with David Mann, CEO of Loggerhead Instruments. In 2017 and 2018, Harley attended the Association of Zoos and Aquariums conferences and interviewed people from many institutions on their needs and interests in curriculum to prepare future zoo/aquarium researchers and managers. These meetings informed the curriculum.We found a high level of interest in future graduates from the proposed program and we will continue to work closely with these groups to best prepare our graduates.

- **any specific needs for research and service that the program would fulfill**

Florida's waters are home to a wide range of marine mammal species including manatees, dolphins, and whales. This includes threatened and endangered species like state marine mammal the Florida manatee. Marine mammals are important to the state of Florida from an ecological perspective, as sentinel species for ecosystem health, and also economically. Marine mammals are a major attraction for visitors, contributing to the tourism sector, a substantial part of Florida's economy. This impact includes visits to the state's approximately 50 zoos and aquaria, boat tours, and snorkeling/diving. Florida has acknowledged the value of marine mammals to the state by not only enforcing national protections such as the Marine Mammal Protection Act and Endangered Species Act, but also by creating state protections such as the Florida Manatee Sanctuary Act. The proposed MIMMS program will help protect the state's marine mammals and the value they bring to the state.

For example, marine mammals face many threats in Florida including loss of seagrass, red tide, and boat strikes. The drastic loss of the majority of seagrass in the Indian River Lagoon region has created an ongoing Unusual Mortality Event (UME) in which over 1,000 Florida manatees have died (Florida Fish and Wildlife Conservation Commission, FWC, 2024; Morris et al., 2022). Red tide, a form of algal blooms that produce toxins, not only have serious health effects for humans but can also be lethal to marine mammals. A red tide in late 2017–early 2019 resulted in the deaths of more than 200 manatees and more than 200 bottlenose dolphins (FWC, 2024; Mote Marine Laboratory, 2019). Mortality from boat strikes impact dolphins, manatees, and the critically endangered North Atlantic Right Whale with an approximate population size of 360 (NOAA, A, 2024). Florida is home to a calving ground for North Atlantic Right Whales and boat strikes; a third of North Atlantic Right Whale mortalities with an identifiable cause is attributed to boat strikes (NOAA, B, 2024). These threats, and many more, require an interdisciplinary approach to address them effectively (Harley, Cook, & Bauer, in press).

The proposed MIMMS program will prepare students to tackle problems like these both during their time in the program through research and outreach as well as beyond

graduation as they enter Florida's workforce. The proposed program will provide students with interdisciplinary knowledge and skills including research design, measurement of variables, data analysis, modeling, statistics, project management, collaboration, boat handling, photo ID, learning and cognition, acoustical analysis, interpreting brain images, and oral and written communication for multiple audiences. Additionally, we will provide ample opportunities for students to apply these skills and knowledge through conducting their own publication-quality research, methodological-focused courses, and internship/practicum experiences. As described above, we have met with representative agencies, aquaria, and research organizations to collaborate on research projects and best prepare our students to contribute to these groups after they graduate. The graduates of the proposed program will be well-prepared to join a Doctoral program or a wide range of occupations including research scientist, veterinarian (with additional training), laboratory manager, statistician, conservation agency staff, zoo and aquarium researchers and managers, conservation policy, and wildlife manager. Example potential agency employers include NOAA, FWC, US Geological Survey, and State Parks.

Florida Fish And Wildlife Conservation Commission. Retrieved January 27, 2024, from https://myfwc.com/research/manatee/rescue-mortality-response/statistics/mortality/

Harley, H.E., Cook, P.F., & Bauer, G.B. (In press). The future of comparative cognition? *Conservation! Comparative Cognition and Behavior Reviews*.

Morris, L. J., Hall, L. M., Jacoby, C. A., Chamberlain, R. H., Hanisak, M. D., Miller, J. D., & Virnstein, R. W. (2022). Seagrass in a Changing Estuary, the Indian River Lagoon, Florida, United States. *Frontiers in Marine Science*, *8*. https://www.frontiersin.org/articles/10.3389/fmars.2021.789818

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National Oceanic and Atmospheric Administration A. Retrieved January 27, 2024, from https://www.fisheries.noaa.gov/species/north-atlantic-right-whale

National Oceanic and Atmospheric Administration B. Retrieved January 27, 2024, from https://www.fisheries.noaa.gov/national/marine-life-distress/2017-2024-north-atlantic-right-whale-unusual-mortality-event

National and Florida Workforce Demand

In the table below, provide occupational linkages or jobs graduates will be qualified to perform based on the training provided for the proposed program that does not currently appear in the most recent version of the Search by CIP or SOC Employment Projections Data Tool provided periodically by Board staff.

Occupational Linkages for the Proposed Program

SOC Code	Occupation Title	Source / Reason for Inclusion
11-9121	Natural Sciences Managers	Graduates' training in marine mammal science prepares them well to become managers of a range of aquatic and/or animal habitats, exhibits, and/or environments. Examples include but not limited to Natural Resource, Wildlife, Fisheries, Hatchery, and/or Aquarium Managers.
19-1023	Zoologists and Wildlife Biologists	Graduates will be trained to demonstrate an integrated understanding of key concepts in biology, ecology, cognition, and neuroscience as applied to marine mammals. Furthermore, equipped with the skills to clearly and effectively communicate marine mammal science to scientific and non-scientific audiences, graduates can easily transition into specialist biologist positions in a range of institutions including but not limited to government agencies, aquatic preserves, zoos, aquariums, universities, and non-profit research facilities.
19-1031	Conservation Scientists	With advanced studies in marine mammal science, graduates will understand how to manage, improve, and protect the environments in which marine mammals live. This knowledge is transferable to jobs related to policy-making, consulting, and sustainability.

Complete the table below and summarize its contents in narrative form. Include data for all linked occupations, including those in the table above. Use data from the Search by CIP or SOC Employment Projections Data Tool provided periodically by Board staff.

Labor Market Demand, CIP Code 45.0102

Occupations	Percent Change in Job Openings		Annual Average Job Openings		Total # of New Jobs		Education Level Needed for Entry
	FL 2022-30	U.S. 2021-31	FL 2022-30	U.S. 2021-31	FL 2023-31	U.S. 2021-31	
Social Scientists and Related Workers, All Other	7.1%	1.6%	169	3700	121	600	B
Social Sciences Teachers, Postsecondary All Other	11.6%	5.5%	87	1800	91	1100	D
Statisticians	39.4%	32.7%	2075	3900	587	11200	M
Managers, All Other	N/A	6.0%	N/A	113100	N/A	78400	N/A
Survey Researchers	5.6%	6.3%	42	1000	24	700	M
Sociologists	6.3%	5.4%	8	300	5	200	M

B. Provide and describe data that support student demand for the proposed program. Include questions asked, results, and other communications with prospective students.

There are several lines of evidence that there is robust student demand for the proposed MIMMS program.

- NCF regularly has students enroll specifically to work with our faculty who have marine mammal expertise.
- Marine mammal-focused courses are popular with undergraduate students and commonly need to be capped for logistic and pedagogical constraints. Below are marine mammal-related courses from the Fall 2018–Fall 2023 period.

Course name	Semester	Professor	Number of students
Comparative Brain Connectivity Laboratory	Offered every Fall 2017-2023	Cook	8-12
Marine Mammal Biology	Fall 2023	Rycyk	26
New Stories, New College: An Interdisciplinary Laboratory Showcasing New College/Community Sciences – WITH Introduction to Museum Studies (Mellon funded) & SDRP	Spring 2023	Harley/Brion	20
Analysis of Florida Manatee Mortality Events	Spring 2022	Rycyk	10
Marine Mammal Biology	Spring 2021	Rycyk	16
Cognitive Laboratory: Parallel Approaches to Facilitating Wellbeing across Species	Spring 2020	Harley	7
Marine Mammal Biology	Spring 2019	Rycyk	14
Wellbeing of Humans and Other Animals: Welfare & Emotions	Fall 2018	Harley	10

- Representative marine mammal-related tutorials include: HFSP-Funded research assistantship: Marine Mammal DTI Tractography + Histology, Marine Mammal Diffusion Tensor Imaging, Calculating Brain Region Volumes in California Sea Lions Using MRI, Advanced Analyses of Manatee Body Condition, Dolphin Acoustic Analysis, Marine Mammal

Acoustics, Analysis of the Underwater Acoustic Behavior of North American River Otters, African Manatee Vocalizations, Sirenian Vocal Behavior, Otter Behavior and Biology, Research Internship in Comparative Cognition: Working with Marine Mammals in Aquaria, Clearwater Marine Aquarium Dolphin Husbandry and Research, Dolphin Field Research, Research Methods in Measuring Harmonics of Bottlenose Dolphins.
    - Representative marine mammal-related Independent Study Projects sponsored (our January term) include: Comparative Brain Connectivity in Sea Otters, Calculating Brain Region Volumes in California Sea Lions Using MRI, Pilot Study Testing Behavioral Flexibility of Wild Otters Solving a Puzzle, Behavior of Captive and Wild Antillean Manatees, Development of a Classification of Spatial Overlap in Algae and Vibrissa in Manatees, A Game of Situational Awareness of Manatees and Boats, Research Assistant for Dolphin Vocalizations/Behavior at Clearwater Marine Aquarium, and Ecological Dolphin Research in Sarasota Bay with SDRP.
- There is high demand for marine mammal research experience. In addition to meeting this need we create/facilitate research opportunities for undergraduate students that prepare them for graduate level work in this field. For example:
    - In the summer of 2020, Dr. Rycyk secured funding from the Environmental Discovery Awards Program and offered four paid undergraduate internships. The students worked with Dr. Rycyk created the first characterization of African manatee vocalizations and continued on the project after the summer. Their efforts resulted in co-authorship on a publication, and two students went on to join graduate programs related to bioacoustics.
    - Dr. Cook is one of four PIs on a $1.4 million international grant to examine the relationship between the behavior, ecology, neurobiology, and evolution of rhythmic communication in marine mammals, including cetaceans and pinnipeds. The grant runs through 2025, and is currently supporting two NCF paid research assistants doing pioneering work mapping the auditory and communication pathways in dolphin and whale brains. Both students are co-authoring related papers as they complete their theses, presenting their data at the Comparative Cognition Conference in April, and have applied competitively to masters and doctoral programs in Neuroscience.
    - Dr. Cook is also part of an ongoing consortium studying the effects of algal toxins on marine mammals, which periodically provides opportunities for NCF students. E.g., a 2022 thesis student used related neuroimaging data for her thesis, and then went on to attend veterinary school and coauthor a published longitudinal case study of a fur seal exposed to algal toxins.
    - Dr. Harley is one of 10 PIs on a multi-million dollar ONR Multi-University Research Initiative grant to learn more about how dolphins use echolocation to parse acoustic information neurally and recognize objects using echolocation. The grant supports New College students working at Clearwater Marine Aquarium and can support future graduate students in the proposed Master's program.
    - Dr. Harley has worked in over a dozen marine mammal facilities, and her students and graduates have worked on projects at many oceanaria including Dolphins Plus, Dolphin Research Center, Mystic Aquarium, Clearwater Marine Aquarium, The Seas, The Mirage, Marine Mammal

Foundation, Gulf World, and more.
    - Chicago Zoological Society's SDRP - 5 student interns/researchers
    - Clearwater Marine Aquarium - 5 student interns/researchers
- At NCF, undergraduate students must complete a thesis project to graduate. Students commonly tie their thesis topic to their intended post-graduation field of study. Below are marine mammal-related undergraduate theses from 2018–2023 period.
    - Brain Connectivity and Mechanoreception in Marine Mammals (2023)
    - The Underwater Vocal Repertoire of The North American River Otter (*Lontra canadensis*) (2020)
    - Case Study of Domoic Acid Toxicosis in A California Sea Lion: Diffusion Imaging Analysis of Anterior Thalamus and Connectivity (2022)
    - The Phenology of Humpback (*Megaptera novaeangliae*), Blue (*Balaenoptera musculus*), Fin (*Balaenoptera physalus*), Sperm (*Physeter macrocephalus*), And Killer Whales (*Orcinus orca*) Determined by Passive Acoustic Monitoring Near Barkley Canyon (2021)
    - Distribution Of the Bigg's Killer Whale Ecotype in The Salish Sea with Regards to Seasonality And Pinniped Vulnerability (2021)
    - What Is Enriching for Bottlenose Dolphins (*Tursiops truncatus*) Across Enrichment Types and Contexts? (2020)
    - How Far Does a Whistle Travel? The Estimated Active Space of Bottlenose Dolphin (*Tursiops truncatus*) Whistle Harmonics in Sarasota Bay, Florida (2018)
    - Characteristics Of Wild Florida Manatee (*Trichechus manatus latirostris*) Vocalizations in Different Sized Groups (2021)
    - · Growth Patterns and The Effect of pH on The Florida Manatee (*Trichechus manatus latirostris*) Vibrissae (2021)
    - Salinity Discrimination in the Florida Manatee (*Trichechus manatus latirostris*)
- Marine mammal faculty often receive requests from students at other schools to work with us in graduate programs. Without a New College program to meet this need, we often suggest the St. Andrews University's Master's in Marine Mammal Science program. However, this program is a difficult option as it is in Scotland, has a 32% acceptance rate, and has a $34,000 cost/year. Additionally, the program is 1-year in length and the proposed New College program is more robust with 2 years.
- In a survey of NCF undergraduate students we asked, "*If you are interested in the program, why are you interested? Please be specific about why you find this program to be a valuable addition.*" Here is a sample of the of the responses:
    - *I am very passionate about marine mammal life and would love to be able to get a master's degree here at New College.*
    - *I am studying environmental engineering sciences, and am involved in research pertaining to the coastal environment of Sarasota Bay. I am also a musician with passions for light and sound science. This program seems to me like a beautiful bridge for me to dive deeper into behavior, neuroscience, and practical applications of engineering study*
    - *Marine mammals science is a popular field. I feel NCF could provide me with that hands-on edge of experience to break into it.*
    - *I am very interested in the program. I have wanted to do marine mammal science for as long as I can remember. I have some experience with*

marine mammal research, with doing pilot whale and dolphin fin identification in the Canary Islands. Participating in this masters would allow me to gain valuable research experience with marine mammals that will let me gain admission into a top level Ph.D. program.

- *I'm interested because I was hoping this would come to light and wished there was a master's program, now there is! My wish literally came true!*
- *I love the professors involved, and I think this is a unique and exciting opportunity. Adding natural science programs would be highly beneficial for NCF for numerous reasons. The marine biology program is already very strong, so I think this is a good method of leveraging that to provide more learning opportunities and gaining new interest in the school.*
- *Sarasota is a very unique location for marine mammal science - and a specific master's program here provides a wide breadth of research opportunities.*
- *As a recent graduate of New College of Florida, I am very excited for the possible Marine Mammal Science Master's program. When looking for potential graduate programs in the field of marine biology, I was hoping to find one that utilized research-based and experiential learning as a part of a well-rounded and interdisciplinary approach. This program perfectly aligns with my scientific interests and goals, and it is certainly one of a kind.*

- With the interdisciplinary focus of the proposed program, there is a large pool of students in undergraduate fields of study that would prepare them for the proposed Master's program. For example within NCF, the number of students who graduated with a major in Marine Biology, Biology, Biopsychology, Psychology, Environmental Studies, Neuroscience, Animal Wellbeing and Conservation was 38 in Spring 2023. When considering related majors within the SUS, there are approximately 10,000 SUS graduates per year as reported from 2017-2021. This pool grows when considering students from around the United States and International and would serve to draw talented students to the state.

C. Complete Appendix A – Table 1 (1-A for undergraduate and 1-B for graduate) with projected student headcount (HC) and full-time equivalents (FTE).

- **Undergraduate FTE must be calculated based on 30 credit hours per year**
- **Graduate FTE must be calculated based on 24 credit hours per year**

In the space below, explain the enrollment projections. If students within the institution are expected to change academic programs to enroll in the proposed program, describe the anticipated enrollment shifts and impact on enrollment in other programs.

Currently, NCF has one Master's program (Applied Data Science). We do not expect students within the institution to switch from Master's in Applied Data Science to MIMMS. We are projecting headcount and FTE of 10 students for the Fall 2024 to operationalize the program. By 2029, total enrollment of first and second year Master's students will grow to a headcount of 62 and FTE of 50.

Faculty have already identified 10 students (NCF undergraduates and alumnae, agency and zoo/aquarium professionals, out-of-state students) who will form the first cohort of

graduate students for MIMMS. In year 2 we will add 7 students from other Florida universities and this will slowly increase in the following years. In year 3 we will add part-time students taking 6 credit hours each from industries and agencies in Florida. This will also slowly increase year by year. In year 4, as word spreads about the MIMMS, we will enroll our first foreign students.

D. Describe the anticipated benefits of the proposed program to the university, local community, and the state. The benefits of the program should be described both quantitatively and qualitatively.

This will be a unique program for the United States, integrating lab and field studies in an interdisciplinary academic setting. MIMMS will partner with world-class universities and experts including the highly esteemed SDRP conducting the longest study of wild dolphins in the world (Sarasota Bay) and colleagues at Woods Hole Oceanographic Institution, St Andrews University (Scotland), and more. The potential for increasing grant funding to New College is high. MIMMS will increase opportunities for undergraduate students at NCF to participate in lab and field research. MIMMS will produce trained scientists for conservation management, lab and field scientists, technicians, and qualified employees for zoos, aquaria, and non-profit organizations.

NCF will benefit from the Master's program by bringing a worldwide eminent research and teaching program to our institution. As the only research-focused Marine Mammal Science Master's in the U.S., we will attract bachelor degree earners from around the globe to enroll. In addition, our focus on Florida, national, and global partnerships will grow and expand, and NCF will be at the center of that movement. Current and future NCF undergraduates will have increased opportunities for classes, research, and attending an affordable graduate program as a continuum to their bachelor's degree.

This program will also benefit our local Sarasota/Manatee community by formally integrating two beloved giants of the Sarasota Community—NCF and the Chicago Zoological Society's SDRP. Bringing graduate students and their research to Sarasota Bay will further integrate NCF into the local community and provide data and conclusions concerning the state of Sarasota Bay and potential management and research priorities (see Appendix D, Letter of Support from Dr. Randy Wells, Director of CZS Program). Ongoing monitoring and research are vital to conserving our precious Bay and to bringing funding and focus to our area. The continued partnership of these two powerhouses will further increase the expertise and partnerships dedicated to studying our marine mammals and their ecosystem.

The program also brings value to our state. Florida has the longest coastline in the mainland U.S. and a plethora of marine mammals on both coasts and within our springs. Our federal and state partners both have strong marine mammal conservation management mandates, yet most of their staff are trained outside of the state. Having a prestigious program within Florida's State University System will give graduates a greater appreciation of Florida's specific ecology and needs.

E. If other public or private institutions in Florida have similar programs at the four- or six-digit CIP Code or in other CIP Codes where 60 percent of the coursework is comparable, identify the institution(s) and geographic

location(s). Summarize the outcome(s) of communication with appropriate personnel (e.g., department chairs, program coordinators, deans) at those institutions regarding the potential impact on their enrollment and opportunities for possible collaboration in the areas of instruction and research.

No public universities in Florida offer a Master's degree in the 45.0102 CIP.

The curriculum of FAU's Master of Marine Science and Oceanography focuses on ecology, finfish, geochemistry, remote sensing, and coastal hazards. There are no courses in common with the proposed New College MIMMs.

We reviewed 49 private, non-profit colleges and universities offering Master's degrees in Florida, however none had the same CIP code. We used the College Navigator from the National Center for Educational Statistics. There are 4 private colleges/universities in Florida that offer a vaguely similar Master's degree in Marine Biology and Biological Oceanography. University of Miami offers a Master of Professional Science (MPS) degree that requires 30 CH. The New College MIMMS is a 48 CH degree, and a research thesis is required.

Table 4: Similarity with Other Programs in the State of Florida (Private & Public)

Institution Name	Public/ Private	Location Program is Being Offered	CIP Code	Program Name
Florida Atlantic University	Public	Ft. Lauderdale	30.3201	Master of Marine Science and Oceanography
Florida Institute of Technology	Private	Melbourne	26.1302	Marine Biology
Jacksonville University	Private	Jacksonville	26.1302	Marine Science
Nova Southeastern University	Private	Ft. Lauderdale	26.1302	Marine Science
University of Miami	Private	Coral Gables	26.1302	Marine Biology and Ecology: Marine Mammal Science Track

F. If the proposed program substantially duplicates a program at Florida Agricultural and Mechanical University (FAMU), a letter of support from FAMU must be provided. The letter must address whether the proposed program may adversely affect FAMU's ability to achieve or maintain student diversity in its existing program. The institution's Equal Opportunity Officer shall review this section of the proposal, sign, and date the additional signature page to indicate that all requirements of this section have been completed.

Not applicable.

IV. Curriculum

A. Describe all admission standards and all graduation requirements for the program. Hyperlinks to institutional websites may be used to supplement the information provided in this subsection; however, these links may not serve as a standalone response. For graduation requirements, describe any additional requirements that do not appear in the program of study (e.g., milestones, academic engagement, publication requirements).

Admissions: The following admission factors will be considered for applicants to the Master of Marine Mammal Science:

1. *Graduate Application for the MIMMS program.
2. Recent employment and/or academic experience (including fellowships, internships, research positions).
3. *Academic record (all post-secondary transcripts), with documentation of a bachelor's degree (or a documented forth-coming degree) from an accredited US college or university (or the foreign equivalent, as determined by a NACES-member transcript evaluation service). Students with academic records from non-US colleges or universities should arrange for professional evaluation (and translation, if necessary) of their transcripts by a NACES-member service.
4. *Letters of recommendation.
5. *Personal statement with preferred area of interest.
6. GRE, GRE Subject, or GMAT scores (preferred but optional).
7. Students who are not US citizens or US Permanent Resident Aliens, and whose first language is not English, must provide proof of English proficiency. Typically, recent scores (within the past two years) will be required, as follows:

    1. Test of English as a Foreign Language (TOEFL): score of 83 or better on the TOEFL IbT, or 560 on the Paper-Based TOEFL; or

    2. International English Language Testing System (IELTS): score of 6.5 or better; or

    3. Recent records (within the past two years) of successful academic or professional work in a setting where English is the primary language in use may be considered as a substitute for the testing requirement.

*Required for admission

The Marine Mammal Science Graduate Academic Program Committee is charged with reviewing candidate application files and selecting students to be offered admission. The Committee is composed of MIMMS' Directors and 2-3

core faculty of the Marine Mammal Science program.

Following the practice established by our existing master's program, selection for an offer of admission to the Program requires the following:

1. Each member of the Committee has reviewed the candidate's file.
2. Each member of the Committee has certified that the candidate's file is complete.
3. Each member of the Committee has considered the candidate's course work and any information regarding relevant job experience with regard to demonstrated skills involving computation, mathematics and statistics.
4. Each member of the Committee has certified that the candidate satisfies the minimum admission requirements.

If any member of the Committee believes an applicant does not meet the minimum requirements, admission can only be offered on a provisional basis, through unanimous consent of the Committee. Provisional admission may be extended for the first semester, for example, if coursework and/or the bachelor's degree is still in progress at the time of review and the candidate can reasonably be expected to provide official transcripts to document meeting the requirement(s) before the second semester begins. If provisional admission is extended, the Committee will specify successful completion of the unmet requirement(s) as a condition required for enrollment after the first semester.

The Committee will determine two tiers of candidates eligible for admission. In determining the tiers, the Committee will acknowledge the importance of a widely representative distribution of skills.

GRADUATION REQUIREMENTS

● Successful completion of all credit and non-credit courses in the first and second year as outlined in "Curriculum" section of the academic program: 48 credit hours

● A minimum of 3.00 cumulative grade point average (GPA) by the end of the program

● Successful oral defense of the thesis to a committee of at least 3 MIMMS faculty

● Successful completion of a master's thesis

Once the MIMMS program is approved by SACS and the Board of Governors, the NCF 2024-25 Graduate Catalog will be revised to encompass both Master's degree programs.

B. Describe the specific expected student learning outcomes associated with the proposed program and include strategies for assessing the proposed program's learning outcomes. If the proposed program is a baccalaureate degree, include a hyperlink to the published Academic Learning Compact and the document itself as Appendix C.

Learning Outcomes are listed below in relation to 6 areas of program emphasis: (1) Research Methods, (2) Quantitative Analysis, (3) Experimental Design and Data Collection, (4) Interdisciplinary Knowledge, (5) Communication, and (6) Professional Skills.

(1) RESEARCH METHODS (Interdisciplinary) GOAL: To offer hands-on experience in both field and laboratory settings, enabling students to apply theoretical knowledge in real-world contexts.
- SLO : Students understand and can critique application of methods across disciplines as well as applying theoretical knowledge to real-world scenarios.

(2) QUANTITATIVE ANALYSIS GOAL: To equip students with advanced skills in research methods, data analysis, statistics, and appropriate technical skills such as programming, brain imaging, and machine learning.
- SLO : Students exhibit proficiency in experimental design, advanced data analysis and statistics, and demonstrate competence in acquiring technical skills such as programming, brain imaging, and machine learning, through practical assignments and lab-based projects.

(3) EXPERIMENTAL DESIGN AND DATA COLLECTION GOAL: To develop proficiency in designing and conducting scientific research, interpreting data, and writing publication-quality scientific manuscripts.
- SLO : Students can design, conduct, and analyze scientific research in marine mammal science, and effectively write and present their findings in a format suitable for scientific publication.

(4) INTERDISCIPLINARY KNOWLEDGE GOAL: To provide an understanding of marine mammal science using an integrated approach that encompasses biology, ecology, cognition, and neuroscience.
- SLO : Students demonstrate an integrated understanding of key concepts in biology, ecology/behavior, cognition, and neuroscience as they apply to marine mammals.

(5) COMMUNICATION GOAL: Equip students with the skills to clearly and effectively communicate marine mammal science to both scientific audiences and the general public, emphasizing clarity and engagement.
- SLO : Students communicate complex marine mammal science topics effectively to scientific peers, undergraduates, and the general public.

(6) PROFESSIONAL SKILLS GOAL: To prepare graduates for diverse career paths in marine mammal science, including research, conservation management, policy-making, and education.
- SLO : Students are prepared to develop a professional network and

successfully manage activities such as collaborative field and laboratory projects in order to engage in diverse career paths in marine mammal science.

The new MIMMS program will be assessed separately from the undergraduate program, but will use the same methodology and follow an annual cycle. A full assessment of student learning will be conducted at the end of Academic Year 2024-25, by the Program Directors and the Marine Mammal Science Graduate Academic Program Committee.

The Marine Mammal Science program has developed a multi-faceted approach to program assessment that provides for uniform evaluation of student progress across the curriculum. All instructors evaluate student performance with respect to six core program student learning outcomes aligned with curricular requirements.

To assess student attainment of these program-level student learning outcomes, faculty in the Marine Mammal Science program have defined three levels of mastery (also see Rubric after Goals Table):

1. Fundamental: Student begins to demonstrate skills in choosing appropriate research methods, quantitative analysis, and designing experiments. Student demonstrates working as part of a team and communicates clearly, both orally and in writing.
2. Intermediate: Student fully demonstrates ability to choose appropriate research methods, quantitative analysis, and design experiments. Student communicates clearly, orally and in writing.
3. Mastery: Student is fully capable of functioning as a productive member of a Marine Mammal Science team assigned to use appropriate methods, experimental design, and quantitative analysis.Student demonstrates mastery of tools and skills required to communicate results to a variety of audiences.

Goal	Assessment Based On	Level of Mastery: Fundamental, Intermediate, Mastery
RESEARCH METHODS Student understands and can critique application of methods across disciplines.	Coursework in Research Methods and Directed Research. Thesis project	Assessed through evaluations of work in courses. Assessed via rubric for thesis project.
QUANTITATIVE ANALYSIS Student analyzes data aptly, uses some	Coursework in Statistics and Analyzing Data. Thesis project	Assessed through evaluations of work in courses. Assessed via rubric for

technology well, and knows how to approach learning new technologies.		thesis project.
EXPERIMENTAL DESIGN AND DATA COLLECTION Student can design and critique experimental designs, and can successfully collect data through scientifically valid techniques.	Coursework in Research Methods, Directed Research, and January term. Thesis project	Assessed through evaluations of work in courses. Assessed via rubric for thesis project.
INTERDISCIPLINARY KNOWLEDGE Student understands and can integrate the study of marine mammals from different disciplinary perspectives.	Coursework in Research Methods, Introduction to Marine Mammals, elective courses. Thesis project	Assessed through evaluations of work in courses. Assessed via rubric for thesis project.
COMMUNICATION Student can present marine mammal science clearly, accessibly, and effectively to multiple kinds of audiences.	Coursework in The Art of the Thesis Proposal, The Art and Science of Writing a Thesis, and Writing a Journal Article. Thesis prospectus presentation, written thesis, oral defense of thesis, opportunistic engagement with the general public.	Assessed through evaluations of work in courses. Assessed via rubric for thesis project.
PROFESSIONAL SKILLS GOAL: To prepare graduates for diverse career paths in marine mammal science, including research, conservation management, policy-making, and education.	Coursework in Seminar in Marine Mammal Science. Work across all program activities.	Assessed periodically through evaluations of work in courses. Assessed via rubric for thesis project.

New College of Florida Master's in Marine Mammal Science

Milestones Rubric: Thesis Committee Assessment after Oral Defense

Student name_____

Date of oral exam_____

Thesis committee:

Sponsor_____

Members_____

Please circle the student's level of mastery for each final goal stated below as: Fundamental (1 point), Intermediate (2 points), or Mastery (3 points)

	Fundamental	Intermediate	Mastery	Total
RESEARCH METHODS				
Demonstrates a thorough understanding of research methods.	1	2	3	
Effectively evaluates the application of research methods in others' work.	1	2	3	
Applies suitable research methods accurately in their own research.	1	2	3	
QUANTITATIVE ANALYSIS				
Demonstrates the ability to appropriately analyze data.	1	2	3	
Utilizes relevant software/programming languages effectively in analysis.	1	2	3	

EXPERIMENTAL DESIGN AND DATA COLLECTION				
Designs experiments that are scientifically valid and robust.	1	2	3	

Effectively and accurately collects data through valid techniques.	1	2	3	
Critically evaluates own and others' experimental designs.	1	2	3	
INTERDISCIPLINARY KNOWLEDGE				
Shows a deep understanding of marine mammals from various disciplinary perspectives.	1	2	3	
Integrates, applies, and explains interdisciplinary knowledge effectively.	1	2	3	
COMMUNICATION				
Presents research clearly and in an accessible manner.	1	2	3	
Effectively engages and communicates with multiple kinds of audiences.	1	2	3	
PROFESSIONAL SKILLS				
Demonstrates ability to develop a professional network.	1	2	3	
Shows successful engagement in collaborative field and laboratory projects.	1	2	3	

C. If the proposed program is an AS-to-BS capstone, provide evidence that it adheres to the guidelines approved by the Articulation Coordinating Committee for such programs, as outlined in State Board of Education Rule 6A-10.024. Additionally, list any prerequisites and identify the specific AS degrees that may transfer into the proposed program.

☒ **Not applicable to this program because it is not an AS-to-BS Capstone.**

D. Describe the curricular framework for the proposed program, including the following information where applicable:

- **total number of semester credit hours for the degree**
- **number of credit hours for each course**
- **required courses, restricted electives, and unrestricted electives**
- **a sequenced course of study for all majors, concentrations, tracks, or areas of emphasis**

MIMMS is designed to reflect NCF's enduring strengths: (1) supporting intellectually motivated and adventurous students; (2) providing students with the opportunity to build strong academic and hands-on skills; (3) approaching learning through an interdisciplinary lens; (4) mentoring each individual student in a way that allows them to reach their self-determined goals; (5) enlisting the New College faculty's and the state of Florida's prowess in marine mammal science and the college's location on the edge of Sarasota Bay, the home of the longest studied population of wild dolphins in the world. The Master's is a 2-year, thesis-required program. The total number of credit hours required to earn a degree is 48.

Students will take the following courses (all are required unless noted as electives):

RESEARCH METHODS (Interdisciplinary)
- Research Methods: Cognition and Neuroscience (3 credits)
- Research Methods: Ecology, Acoustics, and Field (3 credits)

QUANTITATIVE ANALYSIS
- Statistics (3 credits)
- Analyzing Data (3 credits)

EXPERIMENTAL DESIGN AND DATA COLLECTION
- Directed Research (3 credits, every term)
- Seminar in Marine Mammal Science (1.5 credits, every term)

INTERDISCIPLINARY KNOWLEDGE
- Introduction to Marine Mammals (3 credits)
- Elective 1 (3 credits)
- Elective 2 (3 credits)

COMMUNICATION
- The Art of the Thesis Proposal (January term) (3 credits)

- The Art and Science of Writing a Thesis (January term) (3 credits)
- Writing a Journal Article (3 credits)

First Year (each course is 3 credit hours unless noted otherwise)

Fall	January	Spring
Research Methods: Cognition and Neuroscience	The Art of the Thesis Proposal	Statistics
*Research Methods: Ecology, Acoustics, and Field		Introduction to Marine Mammals
Directed Research		Directed Research
Seminar in Marine Mammal Science (1.5 credits)		Seminar in Marine Mammal Science (1.5 credits)

➹Maymester: Visiting Scholar Series (2-week, intensive Electives taught by visiting experts)

Second Year (each course is 3 credit hours unless noted otherwise)

Fall	January	Spring
Elective (potentially in May)	The Art and Science of Writing a Thesis	Elective (potentially in May)
Analyzing Data		Writing a Journal Article
Directed Research		Directed Research
Seminar in Marine Mammal Science (1.5 credits)		Seminar in Marine Mammal Science (1.5 credits)

* SDRP: Sarasota Bay is home to the longest-studied population of wild dolphins in the world. The Chicago Zoological Society's SDRP has now tracked six generations of bottlenose dolphins in the bay for more than 50 years and is committed to engaging in MIMMS (see Appendix D, Letter of Support from Dr. Randy Wells,

Director of CZS Program).

➶ Maymester: SDRP also draws marine mammal scientists from many disciplines from all over the U.S. and the world to participate in health assessments of the dolphins each May, during which time the dolphins may be recorded acoustically and visually, tagged and tracked, sampled, etc. The Master's program will take advantage of this influx of scientists to offer intense short (2-week, 60+-hour) courses in specialized topics taught by marine mammal world experts during a "Maymester". (E.g., see Dolphin Communication in electives below.)

E. Provide a brief description for each course in the proposed curriculum.

Required Courses

Research Methods: Cognition and Neuroscience

In this introductory course, students will learn more about the theories and methods related to studying marine mammal cognition (Mod 1) and neuroscience (Mod 2). In Neuroscience, methods covered will include structural and functional MRI, electrophysiology, histology, and varied approaches to comparative anatomy and physiology. Students will have hands-on experience with marine mammal tissues and imaging datasets. Emphasis will be placed on understanding marine mammal nervous systems in terms of ontogeny and phylogeny, and their relationship to behavioral ecology and disease processes.

Research Methods: Ecology, Acoustics, and Field

In this introductory course, students will learn more about the theories and methods related to studying marine mammal ecology, acoustics, (Mod 1) and behavior, including field work in Sarasota Bay (Mod 2).

The ecology unit will cover common ecological methods such as mark-recapture analyses, population modeling, tagging and tracking, and prey surveys. In the acoustics unit, methods will include acoustic recording methods, sound visualization and analysis techniques, and passive acoustic population analyses.The behavior unit will include focal follows, photo identification, and behavioral sampling schemes.

Statistics

In this course, students will learn about methods to derive information from biological studies, including statistical approaches to interpret laboratory and clinical results. We will cover relevant background on descriptive and inferential statistics, study design and power estimation, hypothesis testing, survival analysis, and Bayesian inference. While some application is required, emphasis is placed on why and when to use each approach. We will give special attention to methods of inference where no underlying distribution is known -- a common case in biological research.

Analyzing Data

In this course, students will work on individualized approaches to data analysis and interpretation. Students will be guided through the process of identifying, conducting,

and interpreting data analyses that are specifically tailored to their research projects. Where appropriate, statistical software and programming languages will be utilized and advanced statistical techniques covered.

Directed Research

In this individualized tutorial, students work with faculty and other students to collect or analyze data in an area selected by the tutorial participants. Data collection will often be done off-site at a marine mammal facility or in the field.

Seminar in Marine Mammal Science

In this on-going seminar, faculty and students will meet weekly to discuss each other's on-going scientific work as well as sharing and discussing peer-reviewed journal articles relevant to that work. Some meetings will include readings, talks by guest speakers, and consideration of hot topics in marine mammal science.

Introduction to Marine Mammals

In this course, students will delve into the world of marine mammals, including cetaceans, sirenians, pinnipeds, and mustelids. Key areas of study encompass life history, physiology, energetics, ecology, cognition, sensory biology, and reproduction. Further, we address the conservation and management challenges faced by these species. By the end, students will understand the classification of marine mammals, their aquatic adaptations, their ecological roles within marine habitats, and key conservation issues.

The Art of the Thesis Proposal (January term)

In this January-term seminar, each student will work with each other and their professors to draft a proposal for their thesis project. The seminar will provide guidance on building a well-constructed proposal including formulating a strong research question, developing a literature review, outlining methodology, drafting an analysis plan, and discussing possible outcomes. A focus will be placed on clear communication, demonstrating project feasibility, and thoughtful planning.

The Art and Science of Writing a Thesis (January term)

In this January-term seminar, each student will create a first draft of their thesis. The seminar will help students organize their findings, consider how their findings fit into the larger context of their field, and synthesize the literature they have reviewed. Additionally, guidance will be provided on the process of structuring and writing a thesis.

Writing a Journal Article

In this focused seminar, students will work to turn their thesis work into a journal article. The seminar will provide guidance on how to structure a manuscript, present data in a clear manner, and effectively communicate complex scientific ideas in writing. An emphasis will be placed on the importance of revision, seeking feedback, and conforming to journal expectations.

Elective Courses - Sampling of Electives (each 3-credit hours) (These will expand over time with the Visiting Scholar Series.)

Acoustics

This course begins with an introduction to underwater acoustic principles, focusing on sound propagation, reflection, absorption, and ambient noise in marine environments. Students will then explore the diverse vocal repertoires of marine mammals, including cetaceans, pinnipeds, and sirenians, emphasizing their functional significance in communication, navigation, and foraging. A pivotal component of this course is the introduction to passive acoustic monitoring techniques. These techniques allow for continuous and non-intrusive monitoring of marine mammals so we may learn about their behavior and ecology.

Animal Learning and Cognition

This seminar will focus on learning theory (e.g., classical and instrumental conditioning) and cognitive processes (e.g., perception, attention, memory, timing) in a variety of species as well as the methods used to study these topics. We will consider this work through multiple frameworks (e.g., ecology, philosophy, conservation). This will include contributions to behavioral flexibility in marine mammals and how cognition suits different species for dealing with different sorts of environmental/social problems.

Students will engage in assessment and design of studies as well as honing their communication skills.

Animal Learning and Cognition Laboratory

The substantial similarities in basic associative learning principles across vertebrates permits generalization of many learning characteristics from the study of just one species. In this lab, students will apply their knowledge of animal learning through training goldfish (Carassius auratus) as a representative species. The laboratory hands-on work will be supplemented with observations of training of marine mammal species (e.g., dolphins, manatees) and shadowing of marine mammal trainers. This course provides basic skills and foundation concepts for behavioral study of cognition.

Neuroecology, Evolutionary and Genetic Neuroscience

In this course students will examine theory and emerging empirical findings examining changes in marine mammal nervous systems as they speciated. We'll examine adaptations to aquatic environments and look at the impact of vastly different foraging and social ecologies in pinnipeds and cetaceans. We'll also consider sensory adaptations in sea otters and sirenians and examine the peripheral and central mechanisms for these.This course is integrative and will span all levels of Neuroscience (Molecular to Systems) and also include diverse concepts in behavioral and sensory ecology.

Dolphin Communication (Visiting Scholar Series)

Dolphins produce a remarkable number of vocalizations. In this time-compressed intensive seminar, we will investigate the structure, functions, and variety of these vocalizations with a specific emphasis on dolphin whistles. Students will explore how we study and what we know about these whistles, including hands-on experience with a local passive acoustic monitoring system set up in Sarasota Bay.

Agencies: Research, Funding, Logistics, Professional Pathways

This course will focus on the outsized role state and federal agencies play in conservation management from permitting to funding to conservation policy. Students will learn how these organizations operate, their impact on research and development, strategies for securing funding, how to navigate logistical challenges, and how to navigate career planning in these organizations.

F. For degree programs in medicine, nursing, and/or allied health sciences, identify the courses with the competencies necessary to meet the requirements in Section 1004.08, Florida Statutes. For teacher preparation programs, identify the courses with the competencies required in Section 1004.04, Florida Statutes.

XXX **Not applicable to this program because the program is not a medicine, nursing, allied health sciences, or teacher preparation program.**

G. Describe any potential impact on related academic programs or departments, such as an increased need for general education or common prerequisite courses or an increased need for required or elective courses outside of the proposed academic program. If the proposed program is a collaborative effort between multiple academic departments, colleges, or schools within the institution, provide letters of support or MOUs from each department, college, or school in Appendix D.

The only other graduate program at NCF is in Data Science. We do not expect to impact resources in Data Science. However, adding MIMMS has the potential to increase undergraduate enrollment at NCF.

Some undergraduate faculty are moving full-time to the Master's program. Full-time replacements for these undergraduate positions have been approved.

H. Identify any established or planned educational sites where the program will be offered or administered. Provide a rationale if the proposed program will only be offered or administered at a site(s) other than the main campus.

The MIMMS program will be located on the main campus of NCF.

I. Describe the anticipated mode of delivery for the proposed program (e.g., face-to-face, distance learning, hybrid). If the method(s) of delivery will require specialized services or additional financial support, describe the projected costs below and discuss how they are reflected in Appendix A – Table 3A or 3B.

The mode of delivery will be face-to-face.

J. Provide a narrative addressing the feasibility of delivering the proposed program through collaboration with other institutions, both public and private. Cite any specific queries of other institutions concerning shared courses, distance/distributed learning technologies, and joint-use facilities for research or internships.

Although the Master's program does not require the participation of any specific outside partner, we have fostered and will continue to foster partnerships with many organizations focused on marine mammal research and conservation. We provide examples of current and future collaborators below.

In 2020 New College of Florida and the Chicago Zoological Society signed a Memorandum of Understanding, initiated by NCF's Prof Harley and the Sarasota Dolphin Research Program's Dr Wells, to enhance collaboration between New College and the Sarasota Dolphin Research Program. That MOU was amended in 2022 to acknowledge the strengthened ties between the organizations through student training and resource sharing. Scientists from both organizations continue to meet regularly to discuss and confirm curricular and research partnerships.

Throughout fall 2023, Dr. Harley (NCF) & Dr. Iske Larkin (UF Veterinary College's Aquatic Animal Health Program) met and corresponded about collaborations within NCF's Master's in Marine Mammal Program and UF's Aquatic Animal Health Program, the potential creation of a state of Florida institute, and the initiation of a Manatee Research and Conservation Consortium. These collaborations include overlapping teaching, research, administrative, and service opportunities.

On August 18, 2023, Harley & Whittle met with Andy Garrett at the FWRI Manatee Necropsy Lab to discuss collaborations. In addition, they also met with FWRI's Director, Gil McRae, to introduce the MIMMS program and future partnership. On the same day, Harley & Whittle also met with Robert Walker, Marine Operations Manager at the Florida Institute of Oceanography, to tour the RV Western Flyer, RV Weatherbird II, and RV W.T. Hogarth for MIMMS research suitability. Finally, they met with Dr. Thomas Frazer, the Dean of USF College of Marine Science (CMS). They discuss MIMMS and CMS and how the two programs could overlap. CMS has no marine mammal researchers, but does have other experts who overlap with their ecology (fish, seagrass, water quality). Dr. Frazer suggested a certificate for USF graduate students from MIMMS.

On November 9, 2023, Elizabeth Fetherston, the Marine Mammal Restoration Coordinator at NOAA NMFS, met Harley & Whittle at NCF to tour the facility and discuss MIMMS. On October 19, 2023, Whittle met with Elizabeth Fetherston & Laura Engleby, the Branch Chief for the NOAA Southeast Regional Office Marine Mammal Branch. NOAA is extremely interested in participating with our Marine Mammal Science Graduate Academic Program Committee, teaching adjunct classes in professional opportunities and skills, and partnering on grants.

On January 11, 2024, Harley & Whittle met with Dr. Paul Kirchman, the USF Sarasota-Manatee Dean of College of Arts and Sciences. They discussed MIMMS and the

potential opportunities for USFSM undergraduates (research, classes) and future graduate students.

On January 18, 2024, Rycyk and Whittle met with Larry Williams, State Program Supervisor for the FWS, and Gianfranco Basili, Deputy State Supervisor for the FWS. They discussed MIMMS and how to align with FWS priorities and current research and working groups.

K. Describe any currently available sites for internship and/or practicum experiences. Describe any plans to seek additional sites in Years 1 through 5.

☐ Not applicable to this program because the program does not require internships or practicums.

- Varied experiences and research opportunities through our partners
- focus on grant funding to expand opportunities

Currently, our undergraduate students have many opportunities for hands-on experience in Marine Mammal Science and we plan to extend those opportunities to the graduate students and expand those opportunities. Undergraduate students have engaged in internships, paid research assistantships, and analyzed data from local, state, national, and international groups. This experience has included agencies such as FWRI, zoos and aquariums like Clearwater Marine Aquarium, research institutions such as Chicago Zoological Society's Sarasota Dolphin Research Program, and non-profit conservation organizations such as the African Marine Mammal Conservation Organization. Research produced from these opportunities has been published in peer-reviewed journals and has included student co-authors. Students have developed methodological skills across fields including, acoustics, ecology, cognition, and neuroscience and have studied whale, dolphin, manatee, sea lion, and otter species. We will build on these opportunities for the graduate students through collaborations and pursuing grants for funding. We have had discussions with FWRI, NOAA, FWS, and multiple aquariums about expanding opportunities.

V. Program Quality Indicators - Reviews and Accreditation

A. List all accreditation agencies and learned societies concerned with the proposed program. If the institution intends to seek specialized accreditation for the proposed program, as described in Board of Governors Regulation 3.006, provide a timeline for seeking specialized accreditation. If specialized accreditation will not be sought, please explain.

Not applicable.

B. Identify all internal or external academic program reviews and/or accreditation visits for any degree programs related to the proposed program at the institution, including but not limited to programs within the academic unit(s) associated with the proposed degree program. List all recommendations from the reviews and summarize the institution's progress in implementing those recommendations.

The program most closely associated with this proposal is our only other graduate degree program, the Master of Science in Applied Data Science. While the Applied Data Science program has not sought specialized accreditation, the program was reviewed by SACSCOC. The SACSCOC committee reviewing the Applied Data Science program recommended New College:

1. develop a more detailed assessment plan to produce evidence that demonstrates the extent to which students are achieving the learning outcomes.
2. establish an advisory board for curriculum development and review

Faculty within the Applied Data Science program quickly developed a more detailed assessment plan and established an advisory committee, and SACSCOC approved the program with no additional requests for information.

This MIMMS program proposal was developed with these recommendations in mind:

1. This proposal includes a detailed assessment plan for the MIMMS program. The plan, similar to the methods of assessment employed by our Applied Data Science program, includes well-defined student learning outcomes, common definitions of levels of mastery, and assessments embedded within classes plus a thesis project.
2. This proposal outlines our efforts to develop an external Florida Institute in Marine Mammal Science / MIMMS Advisory Board to provide strategic advice and support to the program. This proposal includes objectives and responsibilities for this advisory board.

C. For appropriate degree programs, discuss how employer-driven or industry-driven competencies were identified and incorporated into the curriculum. Additionally, indicate whether an industry or employer advisory council exists to provide input for curriculum development, student assessment, and academic-force alignment. If an advisory council is not already in place, describe any plans to develop one or other plans to ensure academic-workforce alignment.

In 2017 and 2018, Harley attended the Association of Zoos and Aquariums conferences and interviewed people from many institutions on their needs and interests in curriculum to prepare future zoo/aquarium researchers and managers. These meetings informed the curriculum.

On August 18, 2023, Harley & Whittle met with Andy Garrett at the FWRI Manatee Necropsy Lab to discuss collaborations. In addition, they also met with FWRI's Director, Gil McRae, to introduce the MIMMS program and future partnership.

On November 9, 2023, Elizabeth Fetherston, the Marine Mammal Restoration Coordinator at NOAA NMFS, met Harley & Whittle at NCF to tour the facility and discuss MIMMS. On October 19, 2023, Whittle met with Elizabeth Fetherston & Laura Engleby, the Branch Chief for the NOAA Southeast Regional Office Marine Mammal Branch. NOAA is extremely interested in advising our Marine Mammal Science Graduate Academic Program Committee, teaching adjunct classes in professional opportunities and skills, and partnering on grants.

On January 18, 2024, Rycyk and Whittle met with Larry Williams, State Program Supervisor for the FWS, and Gianfranco Basili, Deputy State Supervisor for the FWS. They discussed MIMMS and how to align with FWS priorities and current research and working groups. FWS is interested in NCF interns.

On January 31, Harley and Dr. David Mann met to discuss curriculum to prepare students for work at Loggerhead Instruments, an acoustic technology company. He is interested in hiring our graduates.

We are currently developing an external Florida Institute in Marine Mammal Science (FIMMS)/MIMMS Advisory Board with industry expertise to be used for MIMMS. The Advisory Board will provide strategic advice and support to the Master's in Marine Mammal Science (MIMMS).

Proposed FIMMS/MIMMS Advisory Board Objectives and Responsibilities

Objectives:

- Consult on issues of materiality that may influence FIMMS/MIMMS;
- Assist in the development or expansion of the FIMMS/MIMMS network in order to help achieve its goals, including enrollment growth;
- Catalyze networks; improve opportunities for learning, understanding trends, and connecting with businesses, policymakers, and the broader community through speaking opportunities and strategic special events held at or in partnership with FIMMS/MIMMS; and,
- Advance and support the mission of FIMMS/MIMMS among known and new stakeholders alike, as well as other constituencies.

Responsibilities:

To assist FIMMS/MIMMS in achieving these objectives, Advisory Board members will focus on:

- Contributing input and expertise on the implementation of FIMMS/MIMMS's strategic direction;
- Providing feedback and guidance on the development of competencies that align with organizational and programmatic objectives;
- Expanding the network of professionals and functions engaged in FIMMS/MIMMS activities to facilitate knowledge-sharing;
- Interacting with both staff members and stakeholders through mentorship, guest speaking, programmatic interactions, events, and fundraisers;
- Acting as a connector and advocate for potential grants and contractual opportunities;

- Securing funding opportunities that support FIMMS/MIMMS operations and/or project needs;

- Attending at least one Advisory Board meeting per year, whether in person or by telephone or video conference.

By focusing on these overall objectives, we envision the development of a lively and constructive platform for sharing of best practices and lessons learned across our many stakeholder areas with a focus on higher education and research.

VI. Faculty Participation

A. Use Appendix A – Table 2 to identify existing and anticipated full-time faculty who will participate in the proposed program through Year 5, excluding visiting or adjunct faculty. Include the following information for each faculty member or position in Appendix A – Table 2:

- **the faculty code associated with the source of funding for the position**
- **faculty member's name**
- **the highest degree held**
- **academic discipline or specialization**
- **anticipated participation start date in the proposed program**
- **contract status (e.g., tenure, tenure-earning, or multi-year annual [MYA])**
- **contract length in months**
- **percent of annual effort that will support the proposed program (e.g., instruction, advising, supervising)**

This information should be summarized below in narrative form. Additionally, provide the curriculum vitae (CV) for each identified faculty member in Appendix E.

The program will have six full time faculty members, all with terminal degrees, with five joining the program in Fall 2024 and one in Fall 2025. All will contribute 60% effort to the program in Year 1, with disciplines in psychology, biology & marine science, zoology, and statistics. By Year 5, all will contribute 70% to the program. The rest of these faculty members' effort will be related to NCF's undergraduate program and the anticipated state of Florida center, the Florida Institute in Marine Mammal Science (FIMMS). Contract lengths are between 9-11 months.

B. Provide specific evidence demonstrating that the academic unit(s) associated with the proposed program has been productive in teaching, research, and service. Such evidence may include trends over time for average course load, FTE productivity, student HC in major or service courses, degrees granted, external funding attracted, and other qualitative indicators of excellence (e.g., thesis, dissertation, or research supervision).

Teaching

Full Term undergraduate enrollment remained steady 2016-17 for 3 years through 2018-19. Overall NCF enrollment dipped for 2019-20 and 2020-21 and so did undergraduate Psychology and Biology enrollment. In 2021-22 and 2022-23 Psychology

and Biology undergraduate enrollments rebounded, exceeding the 2016-17 levels. A similar pattern occurred for # Undergraduate of Theses Sponsored.

Undergraduate Teaching Productivity for Biology, Marine Biology, Neuroscience, and Health.

	2016-2017			2017-2018			2018-2019			2019-2020			2020-2021			2021-2022			2022-2023		
	Fall 2016	Fall ISP ..	Sprin g 20..	Fall 2017	Fall ISP ..	Sprin g 20..	Fall 2018	Fall ISP ..	Sprin g 20..	Fall 2019	Fall ISP 2..	Sprin g 20..	Fall 2020	Fall ISP ..	Sprin g 20..	Fall 2021	Fall ISP ..	Sprin g 20..	Fall 2022	Fall ISP ..	Sprin g 20..
1. Regular Course Count	15	0	16	16	0	16	15	0	17	20	0	23	21	0	17	17	0	18	11	0	12
2. Full Term Enrollment	350	0	291	317	0	252	325	0	245	318	0	239	236	0	212	189	0	204	164	0	140
3. Module Course Count	0	0	5	2	0	0	0	0	2	0	0	2	0	0	3	0	0	1	1	0	2
4. Module Course Enrollment	0	0	31	12	0	0	0	0	18	0	0	16	0	0	8	0	0	5	6	0	4
5. ISP Enrollment	0	91	0	0	81	0	0	71	0	0	98	0	0	69	0	0	79	0	0	52	0
6. Tutorial Enrollment	81	0	104	52	0	68	66	0	95	64	0	93	76	0	63	73	0	60	55	0	94
7. # of Advisees	109	0	104	90	0	94	91	0	93	121	0	116	108	0	106	71	0	89	95	0	93
8. # of Theses Sponsored	0	0	36	0	0	33	0	0	20	0	0	30	0	0	22	0	0	19	0	0	22
9. # of Bacc Commitees Served	0	0	49	0	0	51	0	0	33	0	0	47	0	0	35	0	0	43	0	0	28

Undergraduate Teaching Productivity for Psychology.

	2016-2017			2017-2018			2018-2019			2019-2020			2020-2021			2021-2022			2022-2023		
	Fall 2016	Fall ISP ..	Sprin g 20..	Fall 2017	Fall ISP ..	Sprin g 20..	Fall 2018	Fall ISP ..	Sprin g 20..	Fall 2019	Fall ISP 2..	Sprin g 20..	Fall 2020	Fall ISP ..	Sprin g 20..	Fall 2021	Fall ISP ..	Sprin g 20..	Fall 2022	Fall ISP ..	Sprin g 20..
1. Regular Course Count	13	0	14	14	0	16	13	0	18	15	0	14	18	0	16	17	0	16	13	0	18
2. Full Term Enrollment	150	0	196	151	0	213	158	0	199	151	0	151	178	0	149	168	0	199	132	0	208
3. Module Course Count	5	0	2	8	0	3	2	0	1	1	0	2	0	0	0	2	0	0	2	0	0
4. Module Course Enrollment	29	0	16	46	0	21	11	0	11	8	0	6	0	0	0	13	0	0	14	0	0
5. ISP Enrollment	0	36	0	0	47	0	0	28	0	0	20	0	0	25	0	0	18	0	0	9	0
6. Tutorial Enrollment	38	0	57	23	0	59	30	0	50	35	0	40	42	0	41	34	0	42	32	0	67
7. # of Advisees	61	0	65	69	0	73	78	0	74	72	0	76	63	0	61	57	0	64	55	0	56
8. # of Theses Sponsored	0	0	19	0	0	22	0	0	22	0	0	18	0	0	21	0	0	19	0	0	17
9. # of Bacc Commitees Served	0	0	37	0	0	29	0	0	42	0	0	27	0	0	34	0	0	33	0	0	29

Summary of Cook, Harley, and Rycyk teaching over last 5 years

	Academic Year				
	2018-2019	2019-2020	2020-2021	2021-2022	2022-2023
1a. # of Courses in Full-term Regular Course	8	8	8	9	7
1b. # of Courses in co-taught Full-Term Regular Course	5	4	4	5	3
2a. # of Enrollment in Full Term Regular Courses	173	108	110	137	114
2b. # of Enrollment in co-taught Full Term Regular Course	24	15	15	20	9
3a. # of Courses in Module Regular Course	0	0	0	1	0
3b. # of Courses in co-taught Module Regular Course	0	0	0	0	0
4a. # of Enrollment in Module Regular Course	0	0	0	5	0
4b. # of Enrollment in co-taught Module Regular Course	0	0	0	0	0
5a. # of Enrollment in ISP	25	11	20	13	13
5b. # of Enrollment in co-taught ISP	0	1	0	0	0
6a. # of Enrollment in Full Term Tutorial	14	16	26	46	66
6b. # of Enrollment in co-taught Full Term Tutorial	0	4	1	0	1
6c. # of Enrollment in Module Tutorial Enrollment	2	8	12	10	22
6d. # of Enrollment in co-taught Module Tutorial Enrollment	0	0	0	0	0
7. # of Advisees	81	83	73	64	66
8. # of Theses Sponsored	9	6	12	11	6
9. # of Bacc Commitees Served	26	13	18	23	13

Research

Summary of Cook, Harley, and Rycyk peer-reviewed publication and conference presentation authorship over the last 5 years. First authorship indicated in parentheses.

	2019	2020	2021	2022	2023
Peer-reviewed publications	2	4 (1)	5 (3)	8 (5)	4 (1)
Conference presentations	8 (7)	5 (4)	5 (4)	16 (4)	9 (4)

Awarded grants in past 5 years

- **Cook, Peter**: PI Human Frontier Science Program Grant: The Social Origins of Rhythm, $1.4 million 2022 - 2025
- **Harley, Heidi**: ONR MURI Grant, Subaward Principal Investigator, Learning from Hearing: Neurobehavioral, Physiological, and Computational Processes of Auditory Object Learning in Mammals, 2022-2025, $3.5 million 2022-2025 with 2-year renewal option.
- **Rycyk, Athena**: Environmental Discovery Awards Program: Acoustics analysis of aquatic, sound-producing organisms, Financial support for interns, $8,500, 2020
- **Rycyk, Athena**: Environmental Discovery Awards Program: Sarasota Bay Dolphin Acoustics, Financial support for interns, $14,985, 2021

Service

Summary of Cook, Harley, and Rycyk New College of Florida service within the last 5 years.

Dr. Peter Cook

- Member, Student Academic Status Committee
- Board Member, New College Child Care Center
- Chart Your Course (General Education Requirements) Steering Committee
- Environmental Studies Steering Committee
- Neuroscience Area of Concentration Steering Committee

Dr. Heidi Harley

- Director of the Environmental Studies program at NCF
- Environmental Studies Steering Committee
- Provost's Advisory Committee (oversees the process of faculty review, retention, tenure, and promotion)
- Search committees for faculty positions
- Animal welfare committees: Bishop Museum, Lemur Conservation Foundation, Walt Disney World, Clearwater Marine Aquarium

Dr. Athena Rycyk

- Director of the Quality Enhancement Program (a requirement for accreditation with SACSCOC) for NCF

- Educational Policy Committee
- Quality Enhancement Plan Committee
- Environmental Studies Steering Committee
- FTIC (first time in college) Summer Advising
- Search committees for faculty positions, Assistant Director for Prestigious Fellowships search committee, and Dean of the Library

VII. Estimate of Investment

A. Use Appendix A – Table 3A or 3B to provide projected costs and associated funding sources for Year 1 and Year 5 of program operation. In narrative form, describe all projected costs and funding sources for the proposed program(s). Data for Year 1 and Year 5 should reflect snapshots in time rather than cumulative costs.

MIMMS will employ 9 FTE positions (60% MIMMS effort for faculty and directors in Yr 1 and 70% MIMMS effort in Yr 5). These include: 1 Faculty Research Director,1 Science Administration Director, 4 Faculty Members, 1 Grants Administrator, 1 Institute Coordinator, 1 Lab Tech, several Adjuncts, and fringe benefits for 9 FTE (33%). The total amount budgeted for personnel and fringe benefits will be $1,016,120 in Yr 1 and $1,280,790 in Yr 5.

Additional equipment needed includes computers, printers, lab equipment, maintenance for equipment, and consumables.The amount budgeted for equipment is $25,000. The $10,000 budget for supplies includes printing and office supplies.

The budget includes $10,000 to contract with a vendor for marketing.

There is a $70,000 budget for vehicles, and vehicle maintenance.

Year 1, AY 24-25, E&G expenditures will be $1,311,920 (which includes $120,000 in non-recurring start-up funds). The total Year 1 budget will be $1,661,920. In Year 5, AY 29-30, E&G expenditures will be $1,456,590; the total budget will be $2,606,590.

Thanks to the support from the Governor and the legislature, NCF has been appropriated increased funding for financial aid. Tuition scholarships for 20 students have been budgeted. The NCF Foundation will support $100,000 in Year 1 scholarships and $400,000 in Year 5. These seem like conservative projections, as the NCF Foundation raised $250,000 in 2023 for graduate programs.

Research Assistantships will be supported through grants and partnerships. In the last 15 years, the marine mammal faculty have brought roughly $600,000 in overhead to the college–more than any other group.

B. Use Appendix A – Table 4 to show how existing Education & General (E&G) funds will be reallocated to support the proposed program in Year 1. Describe each funding source identified in Appendix A – Table 4, and justify below the reallocation of resources. Describe the impact the reallocation of financial resources will have on existing programs, including any possible financial impact of a shift in faculty effort, reallocation of instructional resources, greater use of adjunct faculty and teaching assistants, and explain what steps will be taken to mitigate such impacts.

Recent increases to NCF E&G budget have allowed us to grow the faculty and we are currently searching for 37 undergraduate faculty positions. These hires are based on student enrollment demand, therefore all staffing needs for current undergraduate programs will be met.

C. If the institution intends to operate the program as self-supporting, market tuition rate, or establish a differentiated graduate-level tuition, as described in Board of Governors Regulation 8.002, provide a rationale and a timeline for seeking Board of Governors' approval.

☒ **Not applicable to this program because the program will not operate as self-supporting, market tuition rate, or establish a differentiated graduate-level tuition**.

D. Provide the expected resident and non-resident tuition rate for the proposed program for both resident and non-resident students. The tuition rates should be reported per credit hour unless the institution has received approval for a different tuition structure. If the proposed program will operate as a continuing education program per Board of Governors Regulation 8.002, describe how the tuition amount was calculated and how it is reflected in Appendix A – Table 3B.

Tuition and fee charges will match New College's current graduate tuition and fee schedule. The resident tuition rate will be $474.33 per credit hour; the non-resident rate will be $1,169.47 per credit hour.

The program will not operate as a continuing education program.

E. Describe external financial and in-kind resources available to support the proposed program and explain how this amount is reflected in Appendix A – Table 3A or 3B.

In the last 15 years, the marine mammal faculty have brought roughly $600,000 in overhead to the college–more than any other group. The NCF Foundation raised $250,000 in 2023 for graduate programs. $250,000 in grant funds in Yr 1 and $750,000 in grant funds in Yr 5 will be secured to support the program. Philanthropic funds are estimated to be $100,000 in Yr 1 and $400,000 in Yr 5.

VIII. Self-Supporting and Market Tuition Rate Programs

Note: Skip this section If the proposed program will not operate as a self-

supporting or market tuition rate program.

Proposed Program Type

☐ Market Tuition Rate Program

☐ Online

☐ Continuing Education

☐ Self-Supporting Program

☒ N/A

A. Provide supporting documentation in a separate attachment that serves as evidence that the new program will not supplant any existing similar or equivalent E&G degree offering. Describe the evidence in narrative form below. *Note that Board Regulation 8.002 considers a program similar if it is offered under the same CIP code as one funded under the E&G budget entity.*

B. If the proposed self-supporting or market tuition rate program will be a track under an existing E&G program or has a similar existing E&G program, provide a side-by-side tuition and fee comparison in the table below. Provide a link to the university's website that provides students with information about financial assistance and obligations for repayment of loans for these programs.

☒ Not applicable because the program will not be a track under an existing E&G program or is not similar to an existing E&G program.

Tuition and Fee Comparison

E&G Track or Program	Proposed Program

C. Explain whether the program leads to initial licensing or certification in occupational areas identified as a state critical workforce need. If so, which licenses and certifications will graduates receive upon completion, and explain why implementing the program as self-supporting or market tuition rate is the best strategy to increase the number of graduates in the state.

Note: Questions D – M pertain only to market tuition rate programs. If the proposed program will be self-supporting, skip to Section IX.

D. Explain the process used to determine the proposed market tuition rate and provide the tuition of similar programs offered by other SUS institutions and private institutions as appropriate so that the tuition of at least five similar

programs is provided. If the proposed tuition rates differ for resident and non-resident students, explain why.

E. Explain how offering the proposed program at a market tuition rate is aligned with the university's mission. If the program qualifies as a Program of Strategic Emphasis, provide additional justification for charging higher tuition for the proposed program.

F. Provide a declaratory statement that offering the proposed program at the market tuition rate does not increase the state's fiscal liability or obligation.

G. Explain any proposed restrictions, limitations, or conditions to be placed on the program.

H. Explain how the university will ensure sufficient courses are available to meet student demand and facilitate program completion.

I. If applicable, provide a baseline of current enrollments, including a breakout of resident and non-resident enrollment in similar courses funded by the E&G budget entity.

J. Describe any outcome measures that will be used to determine the program's success.

K. List the campuses and/or sites at which the proposed program will be offered. If the program is only offered online, indicate that, and provide the location from which the program will be managed.

L. Provide an estimate of the total and net annual revenue the university anticipates collecting for Years 1 and 5 if the proposal is approved. This information should be consistent with the data provided in Appendix A – Table 3B, which is required as a part of this proposal.

M. Describe how revenues will be spent, including whether private vendors will be utilized and for what purpose. Additionally, identify all budget entities used for the program.

IX. Non-Faculty Resources

A. Describe library resources currently available to implement and/or sustain the proposed program through Year 5 below, including but not limited to the following:

- **the total number of volumes and serials available in the discipline and related disciplines**
- **all major journals that are available to the university's students**

The Library Director must sign the additional signatures page to indicate they have reviewed Sections IX.A. and IX.B.

NCF's library provides faculty and students immediate access to more than 110,000 scholarly journals representing a broad range of disciplines. Of particular relevance to this proposal, NCF's library holds more than 1000 journals and more than 8000 monographs related to Marine Mammal Science including the most applicable databases for this program (Web of Science, Science Direct, PsycInfo, JSTOR) and many of the most relevant journals (e.g., Marine Mammal Science, Aquatic Mammals, Animal Cognition, Conservation Biology, Behavioural and Brain Sciences).

Perhaps more importantly, modern library technology combined with collaborative agreements between NCF's library and the libraries at other state-funded colleges and universities provide our students and faculty excellent tools to search for and request library resources from other state-funded institutions, including Florida's Research 1 universities: University of Florida, Florida State University, Florida International University, University of South Florida, and the University of Central Florida. Journal articles requested from other Florida libraries by NCF students and faculty are delivered electronically within 48 hours, and frequently arrive only a few short hours after being requested. Books are typically available to patrons 3 to 5 days after being requested, effectively offering NCF's researchers access to a world class research collection.

B. Discuss any additional library resources needed to implement and/or sustain the program through Year 5. Describe how those costs are reflected in Appendix A – Table 3A or 3B.

☒ Not applicable to this program because no additional library resources are needed to implement or sustain the proposed program.

The institution provides (a) student and faculty access and user privileges to its library services and (b) access to regular and timely instruction in the use of the library and other learning/information resources. The new MIMMS program does not need to modify how NCF provides access and user privileges to library services, or the access the College provides to regular and timely instruction in the use of library and other learning/information resources. NCF offers appropriate library and learning/information

access.

NCF already has the search databases most applicable for this program (e.g., Web of Science, ScienceDirect, PsycInfo, JSTOR), as well as the most relevant journals (e.g., Marine Mammal Science, Aquatic Mammals, Animal Cognition, Conservation Biology, Behavioural and Brain Sciences). The library has budgeted for and is in the process of acquiring additional journal packages relevant to this program, including the PsycArticles package and Elsevier's ScienceDirect Freedom Collection of journals. As noted in Section IX.A, Strong working relationships with the libraries at other SUS institutions and a reliable infrastructure ensures timely and efficient access to materials not in the NCF library.

C. Describe any specialized equipment and space currently available to implement and/or sustain the proposed program through Year 5.

Describe the adequacy of physical facilities which will support the change.
The MIMMS program will be housed in the historic Caples Mansion. The mansion has been empty for several years due to major HVAC upgrades, which were recently completed. NCF has a boat dock with 9 slips that can accommodate 7 more vessels in support of the program. Additionally, the Caples Carriage House is functional and will be utilized for a lab space. Current facilities are sufficient for the program.

New furniture, computers, appliances, a vehicle, and lab and teaching equipment will need to be purchased. Computers, lab equipment, boats, and other miscellaneous items will be available to the program. We already have specialized equipment for brain imaging, acoustic recording and analysis, data analysis, behavioral analysis and partnerships with other facilities for field work and other needs.

The Caples Mansion is currently not occupied and there is capacity available at the dock. The Marine Mammal Science Program will not have any significant negative impact on existing programs and services.

D. Describe any additional specialized equipment or space needed to implement and/or sustain the proposed program through Year 5. Include any projected Instruction and Research (I&R) costs of additional space in Appendix A – Table 3A or 3B. Costs for new construction should be provided in response to Section IX.E. below.

X☐ **Not applicable to this program because no new I&R costs are needed to implement or sustain the program through Year 5**

Existing space will be used for the program.

E. If a new capital expenditure for instructional or research space is required, indicate where this item appears on the university's fixed capital outlay priority list. Appendix A – Table 3A or 3B includes only I&R costs. If non-I&R costs, such as indirect costs affecting libraries and student services, are expected to increase due to the program, describe and estimate those expenses in narrative form below. High enrollment programs, in particular,

are expected to necessitate increased costs in non-I&R activities.

X☐ **Not applicable to this program because no new capital expenditures are needed to implement or sustain the program through Year 5.**

F. Describe any additional special categories of resources needed to operate the proposed program through Year 5, such as access to proprietary research facilities, specialized services, or extended travel. Explain how those projected costs of special resources are reflected in Appendix A – Table 3A or 3B.

X☐ **Not applicable to this program because no additional special categories of resources are needed to implement or sustain the program through Year 5.**

G. Describe fellowships, scholarships, and graduate assistantships to be allocated to the proposed program through Year 5 and explain how those are reflected in Appendix A – Table 3A or 3B.

☐ **Not applicable to this program because no fellowships, scholarships, and/or graduate assistantships will be allocated to the proposed program through Year 5.**

Thanks to the support from the Governor and the legislature, NCF has been appropriated increased funding for financial aid. Tuition scholarships for 20 students have been budgeted. The NCF Foundation will support $100,000 in Year 1 scholarships and $400,000 in Year 5. Research Assistantships will be supported through grants and partnerships. Teaching Assistantships in the NCF undergraduate program will also be available to support graduate students.

X. Required Appendices

The appendices listed in tables 1 & 2 below are required for all proposed degree programs except where specifically noted. Institutions should check the appropriate box to indicate if a particular appendix is included to ensure all program-specific requirements are met. Institutions may provide additional appendices to supplement the information provided in the proposal and list them in Table 2 below.

Table 1. Required Appendices by Degree Level

Appendix	Appendix Title	Supplemental Instructions	Included Yes/No	Required for Degree Program Level		
				Bachelors	Masters/ Specialist	Doctoral/ Professional
A	Tables 1-4				X	
B	Consultant's Report and Institutional Response					
C	Academic Learning Compacts	Include a copy of the approved or proposed Academic Learning				

		Compacts for the program				
D	Letters of Support or MOU from Other Academic Units	Required only for programs offered in collaboration with multiple academic units within the institution			X	
E	Common Prerequisite Request Form	This form should also be emailed directly to the BOG Director of Articulation before submitting the program proposal to the Board office for review.				
F	Request for Exemption to the 120 Credit Hour Requirement	Required only for baccalaureate degree programs seeking approval to exceed the 120 credit hour requirement				
G	Request for Specialized Admissions Status	Required only for baccalaureate degree programs seeking approval for specialized admissions status				
H	Attestations for Self-Supporting and Market Tuition Rate Programs	Required only for self-supporting or market tuition rate programs				
I	Faculty Curriculum Vitae				X	

Appendix A

Tables 1- 4

APPENDIX A TABLE 1-B PROJECTED HEADCOUNT FROM POTENTIAL SOURCES (Graduate Degree Program)

1-B, 2, 3-A, 3-B	Year 1 HC	Year 1 FTE	Year 2 HC	Year 2 FTE	Year 3 HC	Year 3 FTE	Year 4 HC	Year 4 FTE	Year 5 HC	Year 5 FTE
Individuals drawn from agencies/industries in your service area (e.g., older returning students)	4	4	5	5	6	3	7	3	8	4
Students who transfer from other graduate programs within the university**	0	0	0	0	0	0	0	0	0	0
Individuals who have recently graduated from preceding degree programs at this university	5	5	12	12	16	16	17	17	22	18
Individuals who graduated from preceding degree programs at other Florida public universities	0	0	7	7	16	12	18	14	22	18
Individuals who graduated from preceding degree programs at non-public Florida institutions	0	0	0	0	1	1	2	2	4	4
Additional in-state residents***	0	0	0	0	0	0	0	0	0	0
Additional out-of-state residents***	1	1	0	0	0	0	0	0	0	0
Additional foreign residents***	0	0	0	0	0	0	4	4	6	6
Other (Explain)***	0	0	0	0	0	0	0	0	0	0
Totals	**10**	**10**	**24**	**24**	**39**	**32**	**48**	**40**	**62**	**50**

* List projected annual headcount of students enrolled in the degree program. List projected yearly cumulative ENROLLMENTS instead of admissions.
** If numbers appear in this category, they should go DOWN in later years.
*** Do not include individuals counted in any PRIOR category in a given COLUMN.

APPENDIX A Table 2 Anticipated Faculty Participation

Faculty Code	Faculty Name or "New Hire" Highest Degree Held Academic Discipline or Specialty	Rank	Contract Status	Initial Date for Participation in Program	Mos. Contract Year 1	FTE Year 1	% Effort for Prg. Year 1	PY Year 1	Mos. Contract Year 5	FTE Year 5	% Effort for Prg. Year 5	PY Year 5
A	Heidi Harley, Ph.D. Psychology	Professor	Tenured	Fall 2024	10	1.00	60.00	0.60	10	1.00	70.00	0.70
A	Peter Cook, Ph.D. Psychology	Associate Professor	Tenured	Fall 2024	9	1.00	60.00	0.60	9	1.00	70.00	0.70
A	Athena Rycyk, Ph.D. Biology & Marine Science	Associate Professor	Tenure Earning	Fall 2024	9	1.00	60.00	0.60	9	1.00	70.00	0.70
A	Amber Whittle, Ph.D. Zoology	Research Administrator	MYA	Fall 2024	11	1.00	60.00	0.60	11	1.00	70.00	0.70
C	New Hire, Ph.D. Statistics*	Assistant Professor	Tenure Earning	Fall 2025	9	0.00	0.00	0.00	9	1.00	70.00	0.70
C	New Hire, Ph.D. Sarasota Dolphin Research Program	Instructor	MYA	Fall 2024	9	1.00	60.00	0.60	9	1.00	70.00	0.70
	Total Person-Years (PY)							**3.00**				**4.20**

* Applied Data Science/Biology faculty will teach Statistics during year 1.

Faculty Code	Code Description	Source of Funding	PY Workload by Budget Classification Year 1		Year 5
A	Existing faculty on a regular line	Current Education & General Revenue	2.40		2.80
B	New faculty to be hired on a vacant line	Current Education & General Revenue	0.00		0.00
C	New faculty to be hired on a new line	New Education & General Revenue	0.60		1.40
D	Existing faculty hired on contracts/grants	Contracts/Grants	0.00		0.00
E	New faculty to be hired on contracts/grants	Contracts/Grants	0.00		0.00
F	Existing faculty on endowed lines	Philanthropy & Endowments	0.00		0.00
G	New faculty on endowed lines	Philanthropy & Endowments	0.00		0.00
H	Existing or new faculty teaching outside of regular/tenure-track line course load	Enterprise Auxiliary Funds	0.00		0.00
		Overall Totals for	**3.00**		**4.20**

APPENDIX A TABLE 3A EROLLMENT AND GROWTH PROJECTED COSTS AND FUNDING SOURCES

Institutions should not edit the categories or budget lines in the table below. This table is specific to state-funded (E&G) programs, and institutions are expected to explain all costs and funding sources in Section VII.A. of the proposal. Detailed definitions for each funding category are located at the bottom of the table.

Budget Line Item	Reallocated Base* (E&G) Year 1	Enrollment Growth (E&G) Year 1	New Recurring (E&G) Year 1	New Non-Recurring (E&G) Year 1	Contracts & Grants (C&G) Year 1	Philanthropy/ Endowments Year 1	Other Funding Year 1 - Please Explain in Section VII.A. of the Proposal	**Subtotal Year 1**	Continuing Base** (E&G) Year 5	New Enrollment Growth (E&G) Year 5	Other*** (E&G) Year 5	Contracts & Grants (C&G) Year 5	Philanthropy/ Endowments Year 5	Other Funding Year 5 - Please Explain in Section VII.A. of the Proposal	**Subtotal Year 5**
Salaries and Benefits (Faculty)	750,120	0	0	0	0	0	0	**$750,120**	1,014,790	0	0	100,000	0	0	**$1,114,790**
Salaries and Benefits (A&P and USPS)	266,000	0	0	0	0	0	0	**$266,000**	266,000	0	0	50,000	0	0	**$316,000**
OPS (including assistantships & fellowships)	50,000	0	0	0	0	0	0	**$50,000**	50,000	0	0	0	0	0	**$50,000**
Programmatic Expenses****	245,800	0	0	0	250,000	100,000	0	**$595,800**	125,800	0	0	600,000	400,000	0	**$1,125,800**
Total Costs	**$1,311,920**	**$0**	**$0**	**$0**	**$250,000**	**$100,000**	**$0**	**$1,661,920**	**$1,456,590**	**$0**	**$0**	**$750,000**	**$400,000**	**$0**	**$2,606,590**

*Identify reallocation sources in Table 4.

**Includes recurring E&G funded costs ("reallocated base," "enrollment growth," and "new recurring") from Years 1-4 that continue into Year 5.

***Identify if non-recurring.

****include library costs, expenses, OCO, special categories, etc.

Faculty and Staff Summary

Total Positions	Year 1	Year 5
Faculty (person-years)	3.00	4.20
FTE (A&P and USPS)	2	3

Calculated Cost per Student FTE

	Year 1	Year 5
Total E&G Funding	$1,311,920	$1,456,590
Annual Student FTE	10	50
E&G Cost per FTE	$131,192.00	$29,131.80

Table 3 Column Explanations

Reallocated Base* (E&G)	1	E&G funds that are already available in the university's budget and will be reallocated to support the new program. Please include these funds in the Table 4 – Anticipated reallocation of E&G funds and indicate their source.
Enrollment Growth (E&G)	2	Additional E&G funds allocated from the "Student and Other fees Tust Fund" contingent on enrollment increases.
New Recurring (E&G)	3	Recurring funds appropriated by the Legislature to support implementation of the program.
New Non-Recurring (E&G)	4	Non-recurring funds appropriated by the Legislature to support implementation of the program. Please provide an explanation of the source of these funds in the budget section (section VII.A.) of the proposal. These funds can include initial investments, such as infrastructure.
Contracts & Grants (C&G)	5	Contracts and grants funding available for the program.
Philanthropy Endowments	6	Funds provided through the foundation or other Direct Support Organizations (DSO) to support the program.
Continuing Base** (E&G)	7	Includes the sum of columns 1, 2, and 3 over time.
New Enrollment Growth (E&G)	8	See explanation provided for column 2.
Other*** (E&G)	9	These are specific funds provided by the Legislature to support implementation of the program.
Contracts & Grants (C&G)	10	See explanation provided for column 5.
Philanthropy Endowments	11	See explanation provided for column 6.
Other Funding	12	Any funding sources not already covered in any other column of the table. Please provide an explanation for any funds listed in these columns in the narrative for Section VII.A. of the proposal.

Worksheet NEW Table 3-A

APPENDIX A TABLE 4 ANTICIPATED REALLOCATION OF EDUCATION GENERAL FUNDS*

Program and/or E&G account from which current funds will be reallocated during Year 1	Base before reallocation	Amount to be reallocated	Base after reallocation
60901 - General Institutional Funds Each fiscal year, the College budgets funds towards general administrative costs; these costs have not been distributed as an adminsitrative convenience. For 24-25, these recurring costs will be reallocated via a cost allocation model.	1,311,920	1,311,920	**$0**
Totals	$1,311,920	$1,311,920	**$0**

*** If not reallocating E&G funds, please submit a zeroed Table 4**

Appendix D

Letters of Support

New College
THE HONORS COLLEGE of Florida

Applied Data Science

March 1, 2024

Florida Board of Governors
State University System
325 West Gaines Street
Tallahassee, FL 32399

I write to confirm, as Director of the Applied Data Science (ADS) Master's Program, my strongest support to my colleagues' proposal to offer a Master's in Marine Mammal Science (MIMMS). This is an excellent opportunity for the college, as New College of Florida enters into an exciting period of significant growth.

Currently NCF offers a single master's program in Applied Data Science, and adding a second will only strengthen our graduate program standing overall within the FL SUS. Our programs target different student populations and therefore I do not anticipate any competition for applicants, but rather see us finding ways for our faculty and graduate students to collaborate.

In fact, Applied Data Science cannot exist in a vacuum and needs other scientists to not only supply data and give context to them, but also to generate context-specific hypotheses that we as data scientists can then act on. As a very specific case in point, our capstone course in the Applied Data Science program called "Practical Data Science" each year invites a partner from industry or academia to share a large dataset together with specific goals that the dataset is supposed to help answer. The students in this course then form groups and work all semester to answer those questions, culminating in a final presentation. I am already looking forward to inviting faculty, students and outside researchers affiliated with the Master's in Marine Mammal Science program to share their datasets and ask us to help make sense and analyze their data.

I appreciate the hard work and great congeniality of my colleagues in putting together this proposal and congratulate them for designing such a strong program. Should I be of further help for your consideration of this proposal, please do not hesitate to contact me.

Bernhard Klingenberg

Bernhard Klingenberg, Ph.D.
Director, Applied Data Science Master's Program

5800 Bay Shore Road | Sarasota, Florida 34243-2109 | 941-487-4172

SARASOTA DOLPHIN RESEARCH PROGRAM
A program of the Chicago Zoological Society

708 Tropical Circle, Sarasota, FL 34242 | 941-374-0449 |sarasotadolphin.org |rwells@mote.org

Dr. Heidi Harley
New College of Florida

December 7, 2023

RE: Proposed Master's in Marine Mammal Science program

Dear Heidi,

I am writing to confirm the Sarasota Dolphin Research Program's intention to engage in student teaching and mentoring in New College of Florida's planned Master's in Marine Mammal Science program. We are excited to continue and expand the work we've been doing with New College over the last decades as outlined in our Memorandum of Understanding with the college. As you know, we have four scientists with PhDs in the marine sciences, all of whom have experience in supporting students at a variety of levels to participate in marine mammal research in the natural laboratory of Sarasota Bay. We look forward to working with you to help future generations learn to study dolphin behavior, health, ecology, and conservation, as we have been doing in Sarasota Bay for more than 53 years, across at least six generations of dolphins.

Sincerely,

Randall S. Wells, Ph.D.
Chicago Zoological Society
Vice President of Marine Mammal Conservation, and
Director, Sarasota Dolphin Research Program

Laela Sayigh

Research Specialist

MS #50, 266 Woods Hole Road, Woods Hole, MA 02543
Office:508-289-2977
lsayigh@whoi.edu www.whoi.edu

December 10, 2023

Dear Heidi,

I am writing to confirm my interest in participating in New College's proposed Master's in Marine Mammal Science program. As you know, I have been coming to Sarasota for many years to study the dolphins in Sarasota Bay, and I am excited about this new program directed towards Florida's marine mammals.

If opportunity allows, I would be interested in partnering with you, including through periodically offering an intensive short elective course on Dolphin Communication. I would also look forward to potentially assisting with supervision of student research on dolphin communication.

Please do not hesitate to contact me should you require any additional information.

Sincerely,

Laela S. Sayigh

New College's proposed Master's in Marine Mammal Science program

External

Inbox

V

Vincent Janik

Mon, Dec 16, 11:07 AM

to me

Dear Heidi,

I am writing to confirm my interest in participating in New College's proposed Master's in Marine Mammal Science program. As you know, I have been coming to Sarasota for many years to study the dolphins in Sarasota Bay, and I am excited about this new program directed towards Florida's marine mammals.

If opportunity allows, I would be interested in partnering with you, including through periodically offering an intensive short elective course on Dolphin Communication.

I'm looking forward to seeing you this May in Sarasota.

All the best,

Vincent

Prof Vincent M. Janik
Scottish Oceans Institute
School of Biology
University of St Andrews
Fife KY16 8LB
UK

*Pending signatures

MEMORANDUM OF UNDERSTANDING

BETWEEN

NEW COLLEGE OF FLORIDA (NCF)

AND

UNIVERSITY OF FLORIDA (UF)

This Memorandum of Understanding (MOU) shall specify the purpose of the Florida Institute of Marine Mammal Science (FIMMS), the need and demand of NCF to be a state of Florida institute or center consistent with the Florida Board of Governors strategic plan, and funding resources.

1. The name of the institute or center.

   Florida Institute of Marine Mammal Science

2. The identification of the host institution and participating institutions.

   NCF will be the host institution and UF will be the participating institution.

3. The mission of the institute or center.

   An interdisciplinary academic center providing research and graduate/undergraduate education of the highest quality in marine mammal science through the collaboration of experts and students dedicated to scientific excellence, marine mammal conservation, and outreach.

4. Guidelines for appointing, funding, supervising, and evaluating the director of the institute or center.

   The NCF Provost and VP for Academic Affairs will directly supervise the director(s) of the Master's in Marine Mammal Science (MIMMS) program, who will typically, but not necessarily, also be the director(s) of FIMMS. The NCF Provost will conduct annual year end reviews of the FIMMS directors based on annual progress reports for FIMMS submitted by the FIMMS directors, as well as meet with FIMMS directors on a monthly basis throughout the academic year. The FIMMS or MIMMS directors will be appointed by the NCF Provost, with funding from state sources (either state appropriations or legislative budget request).

5. The criteria for appointments to the institute or center's advisory board, including terms, roles, authority, and, if known, current numbers.

   NCF's affiliated MIMMS will create a Marine Mammal Science Graduate Academic Program Committee that will assess the programmatic and academic parameters of the program. A coordinating Florida Institute of Marine Mammal Science Advisory Board (FIMMS Advisory Board) will be created upon approval of FIMMS. Board members of the FIMMS Advisory Board will be selected by the Marine Mammal Science Graduate Academic Program Committee be comprised of representatives from participating institutions. Please see Appendix 1.

6. Expectations for the administrative and logistical support for the institute or center, including expectations regarding the reimbursement to the host university for direct costs of administrative services rendered by the university to the institute or center.

   ADMINISTRATION: The NCF Provost and NCF VP for Academic Affairs will directly supervise the MIMMS directors to ensure the quality of the program. NCF will provide administrative and logistical support for FIMMS and will receive compensation for overhead costs from grants initiated through NCF. For shared grants, overhead compensation will be distributed based on the conditions of the grant, including lead institution and sub-awardees.

   TEACHING: NCF's MIMMS and the Aquatic Animal Health Program (AAHP) in the UF's College of Veterinary Medicine will allow students, on an individually determined basis negotiated between program leaders at each institution, to take courses in each other's programs without requiring these students to pay tuition beyond the tuition they already pay to the institution in which they are enrolled, i.e., UF students pay tuition to UF and may take to-be-determined courses in NCF's MIMMS without providing tuition to NCF, and NCF MIMMS students pay tuition to NCF, and may take courses in UF's AAHP without providing tuition to UF. In addition, teaching personnel at each institution may from time to time provide lectures or other academic services to the other institution's students, subject to the rules and/or regulations of each institution, without remuneration.

   RESEARCH: Marine mammal scientists at UF and NCF will seek out opportunities to collaborate with each other on marine mammal science projects in various capacities, e.g., consulting, grant writing, shared students, project design, etc., as overlapping interests warrant.
   SERVICE: Marine mammal scientists at UF and NCF will collaborate on outreach projects to engage and educate Florida's citizens and visitors on marine mammal science and conservation, as opportunities arise.

7. Procedures at the institutional level for recommending increases/decreases in the

appropriation of state funds for the institute or center.

In consultation with the NCF Chief Financial Officer, the NCF Provost, the FIMMS directors, and the FIMMS Advisory Board will determine if recommendations for increasing or decreasing state funds are needed for FIMMS.

8. Specifications for the processing of contracts and grants, including the percentage of overhead funds to be returned to the institute or center.

   The FIMMS Grants Administrator will work directly with NCF's Office of Research Programs and Services and the grant offices of partners to process grants. Overhead compensation will be distributed to the lead institution and sub-awardees based on the conditions of the grant.

9. Expectations and criteria for the cyclic review of the institute or center at least once every five years and other planning and expectations for its operation.

   Annual Institute Progress Reports will be submitted to the NCF Provost and NCF VP of Academic Affairs by the FIMMS directors and used in annual evaluations of the FIMMS directors. The FIMMS will be reviewed based on criteria and procedures established by the Florida Board of Governors' Regulation 10.015(5)(c) at minimum of every five (5) years and will include:

   a. A determination of FIMMS progress related to defined goals and objectives within the context of the FIMM's mission, the missions of participating universities, and the current Florida Board of Governors' Strategic Plan;
   b. An assessment of the return on investment of state dollars, if applicable;
   c. The need for continuation of FIMMS;
   d. Possible changes in mission or organizational structure;
   e. Budget reduction or expansion;
   f. Recommendations for change of classification, if applicable; and
   g. Recommendations for status change (active, inactive, terminated), if applicable.

NEW COLLEGE OF FLORIDA	**UNIVERSITY OF FLORIDA**
Signature:	**Signature:**
Name: Richard Corcoran	**Name: Ben Sasse**
Title: President	**Title: President**
Date:	**Date:**

Appendix 1
FIMMS Advisory Board Charter

Mission:
The Florida Institute of Marine Mammal Science (FIMMS) Advisory Board (Advisory Board) will provide strategic advice and support to FIMMS in realizing its mission of "an interdisciplinary academic center providing research and graduate/undergraduate education of the highest quality in marine mammal science through the collaboration of experts and students dedicated to scientific excellence, marine mammal conservation, and outreach."

Objectives:

- Consult on issues of materiality that may influence FIMMS;
- Assist in the development or expansion of the FIMMS network in order to help achieve its goals, including enrollment growth;
- Catalyze networks; improve opportunities for learning, understanding trends, and connecting with businesses, policymakers, and the broader community through speaking opportunities and strategic special events held at or in partnership with FIMMS; and,
- Advance and support the mission of FIMMS among known and new stakeholders alike, as well as other constituencies.

Responsibilities:

To assist FIMMS in achieving these objectives, Advisory Board members will focus on:

- Contributing input and expertise on the implementation of FIMMS's strategic direction;
- Providing feedback and guidance on the development of competencies that align with organizational and programmatic objectives;
- Expanding the network of professionals and functions engaged in FIMMS activities to facilitate knowledge-sharing;
- Interacting with both staff members and stakeholders through mentorship, guest speaking, programmatic interactions, events, and fundraisers;
- Acting as a connector and advocate for potential grants and contractual opportunities;
- Securing funding opportunities that support FIMMS operations and/or project needs;
- Attending at least one Advisory Council meeting per year, whether in person or by telephone or video conference.

By focusing on these overall objectives, we envision the development of a lively and constructive platform for sharing of best practices and lessons learned across our many stakeholder areas with a focus on higher education and research.

Time Commitment:
Members of the Advisory Board will agree to serve for a 1-year term, which can be extended (to a 2-year and then 3-year term) upon mutual agreement among members of the Advisory Board. The Advisory Board will meet in-person semi-annually (typically for 2-3 hours). FIMMS will also periodically ask Advisory Council members to respond to emails, participate in relevant networking events, join in subgroups, engage in collective impact initiatives, facilitate capacity building and funding opportunities, and/or meet with the FIMMS team on specific initiatives. We will always seek to tailor such requests in a manner that respects each Advisory Board member's time and commitments.

Composition:
The Advisory Board will consist of experts and community leaders who are committed to the mission of FIMMS. Advisory Board members should have relevant domain knowledge, excellent networks and reputations, and a demonstrated commitment to building future success for FIMMS. Members may include, but are not required nor limited to, representatives from university partners, industry, government, non-governmental organizations, nonprofit organizations, foundations, or other strategic partners.

Officers:
The Advisory Board will be led by a Chair or co-Chairs. The Chair(s) is charged with carrying out the mission of the Board and is empowered to perform such duties that would ordinarily pertain to the office, including but not limited to:

- Chairing the meetings of the Advisory Board; and,
- Determining the agenda of the meetings in consultation with the FIMMS Directors.

Appendix I

Faculty CVs

Heidi E. Harley

5010 Sun Circle
Sarasota, FL 34234
(M) 941-685-1387 (O) 941-487-4328
e-mail: harley@ncf.edu

Division of Social Sciences
New College of Florida
5800 Bay Shore Road
Sarasota, FL 34243

Education

University of Hawaii at Manoa, 1993, Ph.D., Psychology
University of Hawaii at Manoa, 1990, M.A., Psychology
University of Colorado at Boulder, 1984, B.A. *cum laude*, Philosophy

Teaching & Training Positions

Courses: Cognitive Psychology, Laboratory in Cognitive Psychology, Psycholinguistics, Animal Perspectives, Wellbeing of Humans and Other Animals (WHOA): Introduction to Animal Wellbeing, Wellbeing of Humans and Other Animals (WHOA): Intersecting Worlds, WHOA: Cognitive Laboratory in Parallel Approaches to Facilitating Wellbeing across Species, WHOA: A Complex Relationship, WHOA: Animals' Welfare Workshop, Animal Communication, Introduction to Environmental Studies, Environmental Practicum, Methods and Representations in Environmental Studies, Environmental Studies Capstone, Psychology Senior Seminar, Comparative Cognition, Laboratory in Comparative Cognition, Introduction to Psychology, Music Perception & Cognition, Introduction to Statistics, Animal Language Research with laboratory, The Art and Science of Happiness, Topics in Marine Mammal Cognition, Humans in Marine Mammal Environments/Marine Mammals in Human Environments, Ethical Considerations of Keeping Animals in Captivity, Topics in Language Development, Evolution of Language and Thought, Developmental Psychology, and more.

Peg Scripps Buzzelli Endowed Chair in Psychology, New College of Florida, 2018-present.

Faculty Director, Environmental Studies Program, New College of Florida, 2002-2004, 2011-present.

Professor, Division of Social Sciences, New College of Florida, 2008-2018.

Associate Professor, Division of Social Sciences, New College of Florida, 1999-2008.

Assistant Professor, Division of Social Sciences, New College of USF, 1994-1999.

Visiting Assistant Professor, Department of Psychology, Rollins College, 1993-1994.

Instructor, Department of Psychology, University of Hawaii at Manoa & West Oahu, 1991-1993 & Summer 1994.

Elementary and Junior High School Teacher, Oak Hall School, Charleston, SC, 1985-1986. Received *Teacher of the Year* award.

Marine Mammal Trainer (killer whale, dolphins, sea lions), Miami Seaquarium, 1982-1984.

Research Positions

Cognitive Scientist, The Seas, Epcot, Walt Disney World, Kissimmee, FL (1993 to present) Cognitive research with bottlenose dolphins.

Research Associate, Mote Marine Laboratory, Sarasota, FL (1997 to present)

Guest Investigator, Woods Hole Oceanographic Institute, Woods Hole, MA (2015 to 2018)

Researcher, Consortium for Research and Education on Marine Mammals (1997 to 2011) Cognitive research with bottlenose dolphins.

Research Scientist, The Mirage Hotel, Las Vegas, NV (2003 to 2006) Cognitive research with bottlenose dolphins.

Research Assistant, Developmental Research Group at the University of Hawaii, Honolulu, HI (1992 to 1993) Cognitive research with 3- to 5-year-olds.

Research Assistant and Marine Mammal Trainer, S.A.I.C. for the Naval Oceans Systems Center, Kailua, HI, (1988 to 1993) Cognitive research with dolphins.

Research Assistant, Laboratory for Comparative Cognition at the University of Hawaii, Honolulu, HI (1986 to 1988) Cognitive research with dolphins, sea lions (Sea Life Park) & rats, pigeons.

Research Assistant, Kewalo Basin Marine Mammal Laboratory at the University of Hawaii, Honolulu, HI (1986 to 1987) Cognitive research with dolphins.

Publications

Roitblat, H.L. & Harley, H.E. (1988). Rat spatial delayed matching-to-sample performance: Acquisition and retention. *Journal of Experimental Psychology: Animal Behavior Processes*, *14*, 71-82.

Roitblat, H.L., Harley, H.E., & Helweg, D.A. (1989). The effects of scopolamine on proactive interference and spatial delayed matching-to-sample performance by rats. *Psychobiology*, *17*, 402-408.

Roitblat, H.L., Bever, T.G., Helweg, D.A., & Harley, H.E. (1991). Online choice and the representation of serially structured stimuli. *Journal of Experimental Psychology: Animal Behavior Processes*, *17*, 55-67.

Roitblat, H.L., Harley, H.E., & Helweg, D.A. (1993). Cognitive processing in artificial language research. In H.L. Roitblat, L.M. Herman, & P.E. Nachtigall (Eds.) *Language and communication: Comparative perspectives* (pp. 1-23). Hillsdale, NJ: Erlbaum.

Harley, H.E., Xitco, M.J., & Roitblat, H.L. (1995). Echolocation, cognition, and the dolphin's world. In R. Kastelein, J. Thomas, & P. Nachtigall (Eds.), *Sensory Systems in Aquatic Mammals* (pp. 515-528). Woerden, The Netherlands: De Spill.

Roitblat, H.L., Helweg, D.A., & Harley, H.E. (1995). Echolocation and imagery. In R. Kastelein, J. Thomas, & P. Nachtigall (Eds.), *Sensory Systems in Aquatic Mammals* (pp. 171-182). Woerden, The Netherlands: De Spill.

Sophian, C., Harley, H.E., & Manos, C.S. (1995). Relational and representational aspects of early number development. *Cognition and Instruction, 13(2),* 253-268.

Harley, H.E., Roitblat, H.L. & Nachtigall, P.E. (1996). Object representation in the bottlenose dolphin (*Tursiops truncatus*): Integration of visual and echoic information. *Journal of Experimental Psychology: Animal Behavior Processes, 22(2)*, 164-174 .

Bompignano, C., Barton, M.E., Callahan, C., Harley, H.E., & Bauer, G.B. (1997). Point and click psychology: Facilitating student acquisition of Internet skills for research. *Council on Undergraduate Research Quarterly, 17 (3),* 130-131/147-148.

Bauer, G.B. & Harley, H.E. (2001). The mimetic dolphin. *Brain and Behavior Sciences, 24(2),* 326-327.

Harley, H.E., Putman, E.A., & Roitblat, H.L. (2003). Bottlenose dolphins perceive object features through echolocation. *Nature, 424,* 667-669.

Harley, H.E. (2004). Identity versus conditional cross-modal matching by the bottlenose dolphin. In J. Thomas, C. Moss, & M. Vater (Eds.), *Echolocation in Bats and Dolphins* (pp. 282-287). Chicago: University of Chicago Press.

Masters, M. & Harley, H.E. Introduction: Performance and cognition in echolocating mammals. (2004). In J. Thomas, C. Moss, & M. Vater (Eds.), *Echolocation in Bats and Dolphins* (pp. 249-259). Chicago: University of Chicago Press.

Delong, C.M., Au, W.W.L., Lemonds, D., Harley, H.E., & Roitblat, H.L. (2006). Acoustic features of objects matched by an echolocating bottlenose dolphin. *Journal of the Acoustical Society of America, 119(3),* 1867-1879.

Fellner, W., Bauer, G.B., & Harley, H.E. (2006). Cognitive implications of synchrony in dolphins: A review. *Aquatic Mammals, 32(4)*, 511-516.

DeLong, C.M., Au, W.W.L., Harley, H.E., Roitblat, H.L., & Pytka, L. (2007). Human listeners provide insights into echo features used by dolphins to discriminate among objects. *Journal of Comparative Psychology, 121(3),* 306-319.

Harley, H.E. (2008). Whistle discrimination and categorization by the bottlenose dolphin (*Tursiops truncatus*): A review of the signature whistle framework and a perceptual test. *Behavioural Processes, 77*, 243-268.

Harley, H.E. & DeLong, C.M. (2008). Echoic object representation by the bottlenose dolphin. *Comparative Cognition and Behavior Reviews, 3,* 46-65.

Harley, H.E., Fellner, W., & Stamper, M.A. (2010). Cognitive research with dolphins (*Tursiops truncatus*) at Disney's The Seas: A program for enrichment, science, education, and conservation. *International Journal of Comparative Psychology, 23,* 331-343.

DeLong, C.M., Heberle, A.L., Marta, K., Harley, H.E., & Au, W.W. (2013). Recognizing objects from multiple orientations using dolphin echoes. POMA, 19, DOI: 10.1121/1.4799416.

Greenhow, D. R., Harley, H. E., Fellner, W., Cardwell, A., and Mann, D. A. 2013. Methods for determining free-swimming positioning and echolocation beam patterns. POMA 19, DOI:10.1121/1.4799416.

Harley, H.E., Fellner, W., & Losch, B. (2013). Dolphin echolocation is not seeing with sound. POMA, 19, DOI: 10.1121/1.4800973.

Harley, H.E. (2013). Consciousness in dolphins? A review of recent evidence. *Journal of Comparative Physiology*. DOI: **10.1007/s00359-013-0816-8.**

King, S.L., Harley, H.E., & Janik, V.M. (2014). The role of signature whistle matching in bottlenose dolphins (*Tursiops truncatus*). *Animal Behaviour 96,* 79-86.

Kershenbaum, A., Blumstein, D., Roch, M., Akcay, C., Backus, G., Bee, M., Bohn, K., Cao, Y., Carter, G., Cäsar, C., Coen, M., DeRuiter, S., Doyle, L., Edelman, S., Ferrer -i-Cancho, R., Freeberg, T., Garland, E., Gustison, M., Harley, H., Huetz, C., Hughes, M., Hyland Bruno, J., Ilany, A., Jin, D., Johnson, M., Ju, C., Karnowski, J., Lohr, B., Manser, M., McCowan, B., Mercado, E., Narins, P., Piel, A., Rice, M., Salmi, R., Sasahara, K., Sayigh, L., Shiu, Y., Taylor, C., Vallejo, E., Waller, S., Zamora-Gutierrez, V. (2014). Acoustic sequences in non-human animals: A tutorial review and prospectus. *Biological Reviews*. Doi: 10.1111/brv.12160

Harley, H.E., & Bauer, G.B. (2017). Cetacean cognition. In J. Vonk & T.K. Schackelford (Eds.), *Encyclopedia of Animal Cognition and Behavior*. New York: Springer.

Harley, H.E. (2017). Cognition. In J. Mann (Ed.), *Deep Thinkers*. Brighton, UK: Ivy Press.

DeLong, C.M., Fellner, W., Wilcox, K.T., Odell, K., & Harley, H.E. (2019). Visual perception in a bottlenose dolphin (*Tursiops truncatus*): Successful recognition of 2D objects rotated in the picture and depth planes. *Journal of Comparative Psychology, 134*(2), 180–196. https://doi.org/10.1037/com0000207

Bauer, G.B., Harley, H.E., & Cook, P.F. (2020). The relevance of ecological transitions to intelligence in marine mammals. *Frontiers in Psychology*.

Delon, N., Cook, P.F., Bauer, G.B., & Harley, H.E. (2020). Consider the agent in the bug: Commentary on Mikhalevich & Powell on *Invertebrate Minds*. *Animal Sentience*.

Harley, H.E., Fellner, W., Frances, C., Thomas, A., Losch, B., Newton, K., & Feuerbach, D. (2022). Information-seeking across auditory scenes by an echolocating dolphin. *Animal Cognition*.

Fellner, W., Harley, H.E., & Losch, B.A. (2022). Observing the nature of relationships in male bottlenose dolphins. *Animal Cognition*.

Harley, H.E., Cook, P.F., & Bauer, G.B. (Submitted). The future of comparative cognition? Conservation! Submitted to *Comparative Cognition and Behavior Reviews*, October 2023.

Presentations/Published Abstracts

Xitco, M.J.Jr., Harley, H.E., Herman, L.M. & Roitblat, H.L. (1987). Behavioral mimicry by bottlenosed dolphins. New Orleans: International Marine Animal Trainers Association.

Xitco, M.J.Jr., Harley, H.E., Herman, L.M., & Roitblat, H.L. (1987). Behavioral mimicry by bottlenosed dolphins. Proceedings for the Seventh Biennial Conference on the Biology of Marine Mammals.

Roitblat, H.L., Harley, H.E., & Helweg, D. (1988). Online choice and hierarchical representation of sequences. Chicago: Psychonomics.

Roitblat, H.L., Harley, H.E., & Helweg, D.A. (1989). Cognitive processing in artificial language research. Honolulu: Language and communication: Comparative perspectives. (Invited.)

Harley, H.E., Roitblat, H.L., & Nachtigall, P.E. (1991). Mixed modality matching-to-sample by a bottlenosed dolphin. Concord, CA: International Marine Animal Trainers Association.

Harley, H.E., Roitblat, H.L., & Nachtigall, P.E. (1991). Mixed modality matching-to-sample by a bottlenosed dolphin. Chicago: 9th Biennial Meeting of the Marine Mammal Society.

Harley, H.E., Roitblat, H.L., & Nachtigall, P.E. (1993). How dolphins represent objects. Washington, DC: Psychonomic Society.

Harley, H.E., Roitblat, H.L., & Nachtigall, P.E. (1993). Object representation in the bottlenosed dolphin (*Tursiops truncatus*). Galveston, TX: 10th Biennial Meeting of the Marine Mammal Society.

Harley, H.E., Xitco, M.J., & Roitblat, H.L. (1993). Echolocation, cognition, and the dolphin's world. Harderwijk, Holland: International Marine Mammal Sensory Symposium. (Invited.)

Harley, H.E. (1995). Spatial and object representation in the bottlenose dolphin. Orlando, FL: 11th Biennial Meeting of the Marine Mammal Society.

Harley, H.E. & Gory, J. (1996). Dolphin cognition research at the Living Seas. Orlando, FL: International Marine Animal Trainers Association, regional meeting.

Harley, H.E. (1998). Signature whistle discrimination by the bottlenose dolphin. Monte Carlo, Monaco: 12th Biennial Meeting of the Marine Mammal Society.

Harley, H.E. (1998). Identity vs. conditional cross-modal matching in the bottlenose dolphin. Carvoeiro, Portugal: Biological Sonar Conference. (Invited.)

Harley, H.E., Colbert, D., Ericsson, C.L., Ericsson, E., Fellner, W., Klega, A., & Lany, J. (1998). Activities designed to lead children and adults to discover some of the principles of echolocation. Carvoeiro, Portugal: Biological Sonar Conference. (Invited.)

Harley, H.E., Xitco, M.J., Jr., Roitblat, H.L., & Herman, L.M. (1998). Imitation of human models by bottlenose dolphins. Naples, Italy: Napoli Social Learning Conference.

Xitco, M.J., Jr., Harley, H.E., & Brill, R.L. (1998). Action level imitation by bottlenose dolphins. Naples, Italy: Napoli Social Learning Conference.

Lany, J. & Harley, H.E. (1998). Cross-sentential cues to syntactic structure in speech to preverbal and combinatorial babies. London: Child Language Workshop.

Clark, D., Weber, E., & Harley, H.E. (1998). Acoustic processing in the bottlenose dolphin. Faro, Portugal: Annual Meeting of the International Marine Animal Trainers' Association.

Harley, H.E. (1999). The interaction of vision and echolocation. Sarasota, FL: Regional Meeting of the International Marine Animal Trainers' Association.

Harley, H.E. (1999). The interaction of vision and echolocation. Invited colloquium. Naples, Italy: *Stazione Zoologica*.

Harley, H.E. (1999). Discrimination and categorization of signature whistles by a bottlenose dolphin. Kihei, Hawaii: 13th Biennial Meeting of the Marine Mammal Society. (Invited.)

Odell, K., Weber, E., Clark, D., & Harley, H.E. (1999). Rhythm discrimination by a bottlenose dolphin. Chicago, IL: Annual Meeting of the International Marine Animal Trainers Association.

Asano, T. & Harley, H.E. (2000). Japanese-English bilingual children's language switching in mixed-language conversation. Kyoto, Japan: Meeting of the Japanese Society for Language Sciences.

Harley, H.E. (2000). Object matching across vision and echolocation by dolphins and humans. Atlanta, GA: Meeting of the Acoustical Society of America.

Harley, H.E. & Weber, E. (2000). Mechanisms for cross-modal matching by the bottlenose dolphin. Playa del Carmen, Mexico: Annual Meeting of the International Marine Animal Trainers Association.

Harley, H.E., Kuczaj, S., & Xitco, M.J., Jr. (2000). Workshop on cognition. Playa del Carmen, Mexico: Annual Meeting of the International Marine Animal Trainers Association. (Invited.)

DeLong, C.M., Harley, H.E., & Au, W.W.L. (2000). Acoustic analysis of objects ensonified by a bottlenose dolphin during a cross-modal matching task. Paper presented at the William Cummings Session on the Acoustics of Whales and Dolphins, 140th Meeting of the Acoustical Society of America, Newport Beach, California.

Harley, H.E. & Weber, E. (2001). Mechanisms for cross-modal matching by the bottlenose dolphin. Melbourne, FL: Annual International Conference on Comparative Cognition.

Harley, H.E. & Putman, E.A. (2001). Object recognition in the bottlenose dolphin: How vision and echolocation interact. Orlando, FL: Meeting of the Psychonomics Society.

Harley, H.E., Putman, E.A., & DeLong, C.M. (2001). Object recognition in the bottlenose dolphin: How vision and echolocation interact. Vancouver, Canada: 14th Biennial Conference on the Biology of Marine Mammals.

DeLong, C.M., Harley, H.E., & Au, W.W.L. (2001). Echoic cues used by a bottlenosed dolphins during multiple cross-modal matching tasks. Vancouver, Canada: 14th Biennial Conference on the Biology of Marine Mammals.

Harley, H.E., Odell, K., Putman, E.A., Clark, D., Goonen, C. & DeLong, C.M. (2002). Belated ode to Stewart Hulse: Dolphins got rhythm. Melbourne, FL: Annual International Conference on Comparative Cognition.

Harley, H.E., Odell, K., Putman, E.A., Clark, D., Goonen, C. & DeLong, C.M. (2002). Rhythm perception and discrimination by the bottlenose dolphin. Orlando, FL: Meeting of the International Marine Animal Trainers' Association.

Harley, H.E. (2003). Echoic object feature extraction by a bottlenose dolphin. Melbourne, FL: Annual International Conference on Comparative Cognition.

Harley, H.E. (2003). Whistle perception by a bottlenose dolphin (111-112). College Park, MD: International Conference on Acoustic Communication by Animals.

Harley, H.E., Odell, K., Fellner, W., Putman, E.A., Clark, D., Goonen, C. & DeLong, C.M. (2003). Rhythm discrimination by the bottlenose dolphin. Greensboro, NC: 15th Biennial Conference on the Biology of Marine Mammals.

DeLong, C.M., Au, W.W.W., Roitblat, H.L., & Harley, H.E. (2003). Echoic object feature extraction by dolphins and people. Greensboro, NC: 15th Biennial Conference on the Biology of Marine Mammals.

Harley, H.E., Fellner, W., & Larsen-Plott, L. (2004). Rhythm production by the bottlenose dolphin. Melbourne, FL: Annual International Conference on Comparative Cognition.

Orth, J.H. & Harley, H.E. (2004). Whistle rates in a group of bottlenose dolphins over changes in composition. Melbourne, FL: Annual International Conference on Comparative Cognition.

Cardwell, A.M. & Harley, H.E. (2004). Cooperative matching-to-sample by bottlenose dolphins. Melbourne, FL: Annual International Conference on Comparative Cognition.

Harley, H.E. (2004). The dolphin's world. Sarasota, FL: New College of Florida Orientation Lecture. (Invited.)

Harley, H.E. (2004). Connecting dolphins in human care to their wild counterparts. Orlando, FL: Meeting of the Educators of the Alliance of Marine Mammal Parks and Aquariums. (Invited.)

Harley, H.E., Fellner, W.L., Odell, K., & Putman, E. (2005). Representation of acoustic rhythms by the bottlenose dolphin. Melbourne, FL: Annual International Conference on Comparative Cognition.

Chapman, K.M. & Harley, H.E. (March, 2005). Multiple measures of handedness & lateriality in three species of lemur: *Lemur cattta, Eulemur mongoz, and Eulemur fulvus rufus*. Melbourne, FL: Annual International Conference on Comparative Cognition.

Harley, H.E. (May, 2005). Cognitive research with dolphins: What is it? How do you do it? What have we found out? Orlando, FL: Regional meeting of the International Marine Animal Trainers' Association. (Invited.)

Harley, H.E., Fellner, W., Odell, K., Larsen-Plott, L., & Crowell, S. (2005). Rhythm perception and production by the bottlenose dolphin. Minneapolis, MN: 150th Meeting of the Acoustical Society of America. (Invited.)

Cardwell, A. & Harley, H.E. (2005). Cooperative echoic matching by two bottlenose dolphins. Duck Key, FL: Meeting of the International Marine Animal Trainers' Association.

Harley, H.E., Fellner, W., Larsen-Plott, L., & Crowell, S. (2005). Rhythm production by the bottlenose dolphin. Duck Key, FL: Meeting of the International Marine Animal Trainers' Association.

Cardwell, A. & Harley, H.E. (2005). Cooperative echoic matching by two bottlenose dolphins. San Diego, CA: 16th Biennial Conference on the Biology of Marine Mammals.

Harley, H.E., Fellner, W., Larsen-Plott, L., & Crowell, S. (2005). Rhythm production by the bottlenose dolphin. San Diego, CA: 16th Biennial Conference on the Biology of Marine Mammals.

Crowell, S., Harley, H.E., Fellner, W., & Larsen-Plott, L. (2005). Vocal productions of rhythms by the bottlenose dolphin. San Diego, CA: 16th Biennial Conference on the Biology of Marine Mammals.

Fellner, W. & Harley, H.E. (2006). Dolphin vocal responses to acoustic stimuli. Melbourne, FL: Comparative Cognition Conference.

Crowell, S., Harley, H.E., Fellner, W., & Larsen-Plott, L. (2006). Vocal productions of rhythms by the bottlenose dolphin. Melbourne, FL: Comparative Cognition Conference.

Harley, H.E., Fellner, W., & Odell, K. (2007). Object-Photo/Photo-Object Matching by the Bottlenose Dolphin. Melbourne, FL: Comparative Cognition Conference.

Pytka, L., Harley, H.E., & Curtiss-Floyd, R.L. (2007). O grape, where art thou? Melbourne, FL: Comparative Cognition Conference.

Harley, H.E., Fellner, W., & Losch, B. (2007). Extracting object feature information from echoes by the bottlenose dolphin, *Tursiops truncatus*. Cape Town, South Africa: 17th Biennial Conference on the Biology of Marine Mammals.

Cardwell, A.M., Harley, H.E., & Vennare, A.M. (2007). Echoic pointing by two bottlenose dolphins during a cooperative echoic matching task. Cape Town, South Africa: 17th Biennial Conference on the Biology of Marine Mammals.

Harley, H.E., Fellner, W., & Losch, B. (2008). Extracting object feature information from echoes by the bottlenose dolphin, *Tursiops truncatus*. Melbourne, FL: Comparative Cognition Conference.

Cardwell, A.M., Vennare, A.M., & Harley, H.E. (2008). Echoic pointing by two bottlenose dolphins during a cooperative echoic matching task. Melbourne, FL: Comparative Cognition Conference.

Fellner, W. & Harley, H.E. (2008). Variations in vocalizations in the bottlenose dolphin in different contexts. Melbourne, FL: Comparative Cognition Conference.

Fellner, W. & Harley, H.E. (2009). Bottlenose dolphin (*Tursiops truncatus*) whistles vary by context. Melbourne, FL: Comparative Cognition Conference.

Harley, H.E., Fellner, W., & Losch, B. (2009). Echoic shape discrimination by dolphins? Kyoto, Japan: The 5th Annual Sonar Symposium. (Invited.)

Leighty, K.A., Fellner, W., Harley, H.E., Maloney, M.A., Stamper, M.A., & Bettinger, T. (2009). Investigating the minds of animals in zoos and aquaria: Benefiting our animals, our visitors, and scientific knowledge. Portland, OR: Annual conference of the Association of Zoos and Aquariums.

Harley, H.E., Fellner, W., & Losch, B. (2009). Echoic shape discrimination by dolphins? Quebec City, Quebec, Canada: The 18th Biennial Conference on the Biology of Marine Mammals.

Abbott, J.T., Clark, J., Harley, H.E., Fellner, W. & O'Brien, C. (2009). Frequencies and syntax in sequences of dolphin vocalizations. Quebec City, Quebec, Canada: The 18th Biennial Conference on the Biology of Marine Mammals.

Fellner, W., Losch, B.A., Bauer, G.B., & Harley, H.E. (2009). Synchrony characteristics change over time among four captive male bottlenose dolphins. Quebec City, Quebec, Canada: The 18th Biennial Conference on the Biology of Marine Mammals.

Fellner, W., Clark, J., Abbott, J.T., & Harley, H.E. (2010). Micro-whistles: An overlooked category of vocalizations in Atlantic bottlenose dolphins (*Tursiops truncatus*). Melbourne, FL: Comparative Cognition Conference.

Abbott, J.T., Harley, H.E., Clark, J., & Fellner, W. (2010). Patterns in sequences of dolphin vocalizations. Melbourne, FL: Comparative Cognition Conference.

Clark, J., Fellner, W., & Harley, H.E. (2010). Context-dependent use of signature whistles in the Atlantic bottlenose dolphin (*Tursiops truncatus*). Melbourne, FL: Comparative Cognition Conference.

Harley, H.E. (2010). Echolocation and reference in the bottlenose dolphin. Berlin, Germany: Comparative and Evolutionary Perspectives on Referential Communication and Cooperation. (Invited.)

Harley, H.E., Cardwell, A., Clark, J., & Vennare, A. (2011). Echoic pointing by the bottlenose dolphin. Melbourne, FL: Comparative Cognition Conference.

Fellner, W., Harley, H.E., & Clark, J. (2011). Production of combination vocalizations by bottlenose dolphins (Tursiops truncatus). Melbourne, FL: Comparative Cognition Conference.

Clark, J., Fellner, W., & Harley, H.E. (2011). Individual differences in vocalizations of isolated bottlenose dolphins. Melbourne, FL: Comparative Cognition Conference.

Harley, H.E., Fellner, W., Losch, B., Larsen, L., Odell, K., Brantley, C., Feuerbach, & Ward, D. (2011). Analogical reasoning by a bottlenose dolphin. Tampa, FL: The 19th Biennial Conference on the Biology of Marine Mammals.

Fellner, W., Clark, J., Abbott, J.T., & Harley, H.E. (2011). Fine-scale analysis of bottlenose dolphin vocalizations reveal differential use of sub-units. Tampa, FL: The 19th Biennial Conference on the Biology of Marine Mammals.

DeLong, C.M., Harley, H.E., Heberle, A., & Au, W.W.L. (2011). Auditory object constancy: Recognition of objects from multiple orientations by human listeners using dolphins echoes. Tampa, FL: The 19th Biennial Conference on the Biology of Marine Mammals.

DeLong, C.M., Harley, H.E., Heberle, A.L., & Au, W.W.L. (2012). Auditory object constancy: Recognition of objects from multiple orientations by human listeners using dolphin echoes. 19th Annual International Conference on Comparative Cognition, Melbourne, FL.

Fellner, W., Ward, D., & Harley, H.E. (2012). Dolphins' vocal responses to narrowband and broadband vocalizations produced in multiple contexts. 19th Annual International Conference on Comparative Cognition, Melbourne, FL.

Harley, H.E. (2012). Information Processing in Environmental Education. Socio-Economic Connections Panelist, Sarasota Bay Watershed Symposium, Sarasota, FL.

Harley, H.E., Bauer, G., & Graham, S. (2012). Workshop leader: Limits and possibilities for motivating behavior change: A psychological perspective. Sarasota Bay Watershed Symposium, Sarasota, FL.

Harley, H.E. (2012). Queries on dolphin consciousness, cognition, & communication. International Conference on the Sensory Biology of Aquatic Mammals, Rostock, Germany. (Invited.)

Harley, H.E. (2013). Queries on dolphin consciousness. Disney's Animal Kingdom, Kissimmee, FL. (Invited.)

Fellner, W., Harley, H.E., & Odell, K. (2013). Object matching of rotated objects by a dolphin. 20th Annual International Conference on Comparative Cognition, Melbourne, FL.

Newton, K.T. & Harley, H.E. (2013). Using your melon: The effects of object recognition on echolocation. Council for Undergraduate Research: On the Hill, Washington, D.C.

Harley, H.E., Fellner, W., & Losch, B.A. (2013). Dolphin echolocation is not seeing with sound. Acoustical Society of America, Montreal, Canada. (Invited.)

Greenhow, D., Harley, H.E., Fellner, W., Cardwell, A., & Mann, D. (2013, June). Methods for determining free-swimming positioning and echolocation beam patterns. 165th Meeting of the Acoustical Society of America, Montreal, Quebec, Canada.

DeLong, C.M., Heberle, A., Mata, K., Harley, H.E., & Au, W.W. (2013). Recognizing objects from multiple orientations using dolphin echoes. 165th Meeting of the Acoustical Society of America, Montreal, Quebec, Canada.

Harley, H.E. (2013). Cognition and communication in the bottlenose dolphin. NIMBioS Workshop: Multidisciplinary approaches to analyzing vocal communication sequences, Knoxville, TN. (Invited.)

Newton, K.T., Harley, H.E., Fellner, W., Ward, D., & Losch, B. (2013). The influence of object familiarity and discriminability on echoic effort. The 20th Biennial Conference on the Biology of Marine Mammals, Dunedin, New Zealand.

Harley, H.E., Fellner, W., Ward, D., Stamper, M.A., Green, L.L., & Larsen, L. (2014). Bottlenose dolphins perceive projected stimuli. 21st Annual International Conference on Comparative Cognition, Melbourne, FL.

Hill, H., Miller, L., Harley, H.E., & Shepherdson, D. (2014). Research helping animals & animals helping research: Developing successful collaborative research efforts. Annual Conference of the Association of Zoos & Aquariums and the International Marine Animal Trainers' Association, Orlando, FL.

Harley, H.E., Fellner, W., & Losch, B.A. (2014). Dolphin echolocation is not seeing with sound. 55th Annual Meeting of the Psychonomic Society, Long Beach, CA.

Harley, H.E., Newton, K.T., Fellner, W., Frances, C., Losch, B., & Hagopian, K. (2015). The influence of object familiarity and discriminability on a dolphin's echoic effort. 22nd Annual International Conference on Comparative Cognition, Melbourne, FL.

Harley, H.E. (2015). The swamp of the dolphin mystique. Workshop presentation at the 21st Biennial Conference on Marine Mammals, San Francisco, CA. (Invited.)

Harley, H.E., Fellner, W., Frances, C., Losch, B.A., & Thomas, A. (2015). Echolocation as a window into metacognition. 21st Biennial Conference on Marine Mammals, San Francisco, CA.

Fellner, W., Losch, B., & Harley, H.E. (2016). Bond formation in a managed collection of male common bottlenose dolphins *(Tursiops truncatus)*. 21st Biennial Conference on Marine Mammals, San Francisco, CA.

Harley, H.E., Fellner, W., Odell, K., Larsen, L., & Crowell, S. (2016). Rhythm perception and production by the bottlenose dolphin. Workshop presentation at the 11th International Conference on the Evolution of Language, New Orleans, MS. (Invited.)

Harley, H.E., Fellner, W., Larsen, L., & Green, L. (2016). A method for studying recall in dolphins. 23rd Annual International Conference on Comparative Cognition, Melbourne, FL.

Fellner, W., Losch, B.A., & Harley, H.E. (2016). Bond formation in a managed collection of male common bottlenose dolphins *(Tursiops truncatus)*. 23rd Annual International Conference on Comparative Cognition, Melbourne, FL.

Harley, H.E., Fellner, W., Frances, C., Thomas, A., Losch, B.A., & Feuerbach, D.A. (2016). Information-Seeking in an Echolocating Dolphin. 5th Joint Meeting of the Acoustical Society of America and Acoustical Society of Japan, Honolulu, HI, USA.

Harley, H.E., Fellner, W., Frances, C., Thomas, A., Losch, B.A., & Feuerbach, D.A. (2016). Information-Seeking in an Echolocating Dolphin. Psychonomic Society's 57th Annual Meeting, Boston, MA, USA.

Carbary, L.G., Odell, K., Fellner, W., & Harley, H.E. (2016). Where's Waldo?: The dolphin edition. Annual Conference of the International Marine Animal Trainer's Association, San Diego, CA, USA.

Fellner, W., Harley, H.E., Green, L., Goonen, C., & Odell, K. (2017). An echolocator's discrimination of marine animals using vision. 24th Annual International Conference on Comparative Cognition, Melbourne, FL.

Harley, H.E. (2017). Dolphin cognition through the decades: Reflections in memory of Stan Kuczaj. 24th Annual International Conference on Comparative Cognition, Melbourne, FL. (Invited.)

Harley, H.E., Fellner, W., Larsen, L., Green, L., Odell, K., & Stamper, M.A. (2017). Dolphin-human two-way communication system allows exploration of recall memory. 22nd Biennial Conference on Marine Mammals, Halifax, Canada.

Harley, H.E. (2017). A fish is a fish is a fish: Multisensory integration and cognition in marine mammals. Marine mammal sensory systems: An integrated perspective. Workshop at the 22nd Biennial Conference on Marine Mammals, Halifax, Canada. (Invited.)

Harley, H.E., Fellner, W., & Stamper, M.A. (2018). Educating the public about other minds: Dolphin cognition research as a window to science and other animals. Florida Marine Mammal Health Conference VI, Orlando, FL. (Invited.)

Fellner, W., Au, W.W.L., Harley, H.E., Atkins, J., & Volpilier. (2018). Changes in a dolphin's echolocation clicks across object sets in a matching task. 25th Annual International Conference on Comparative Cognition, Melbourne, FL.

Harley, H.E., Fellner, W., & Stamper, M.A. (2019). Educating the public about other minds: Dolphin cognition research as a window to science. American Psychological Association Annual Convention, Chicago, IL.

Harley, H.E., Fellner, W., Odell, K., & Stamper, M.A. (2019). Dolphin welfare: Autonomous foraging & cognitive science at The Seas. International Marine Animal Trainers' Association and Association of Zoos and Aquariums Annual Conference, New Orleans, LA.

Harley, H.E., Fellner, W., Odell, K., & Stamper, M.A. (2019). Stealthy foraging: Dolphins can discriminate among marine species using vision alone. 23rd Biennial Conference on Marine Mammals, Barcelona, Spain.

Harley, H.E. (2020). Dolphins stay in touch: Whistles, clicks, and blats. Sitka Whalefest, Sitka, Alaska. (Invited.)

Harley, H.E., Fellner, W., Odell, K., & Stamper, M.A. (2021). Visual discrimination of potential prey by bottlenose dolphins. 26th Annual International Conference on Comparative Cognition, Zoom.

Harley, H.E. (2022). Mysteries of other minds: Studying dolphin cognition in zoos and aquaria. Indiana University Bloomington. (Invited).

Fellner, W., Losch, B.A., & Harley, H.E. (2022). Affiliation and agonism: Observing the nature of relationships in bottlenose dolphins. 27th Annual International Conference on Comparative Cognition, Zoom.

Harley, H.E., & Fellner, W. (2022). WAU! Identifying complex shapes with an acoustic flashlight? Meeting of the Acoustical Society of America, Denver, CO.

Harley, H.E., Fellner, W., & Odell,K. (2022) Bottlenose dolphins recognize conspecifics using vision alone. 24th Biennial Conference on Marine Mammals, West Palm Beach, FL.

Fellner, W., Losch, B.A., & Harley, H.E. (2022). Affiliation and agonism: Observing the nature of relationships in bottlenose dolphins. 24th Biennial Conference on Marine Mammals, West Palm Beach, FL.

Harley, H.E., Fellner, W., Frances, C., Thomas, A., Losch, B., Newton, K., & Feuerbach, D. (2023). Information-seeking across auditory scenes by an echolocating dolphin. Batsheva de Rothschild Conference on Active Sensing: From Animals to Robots, Rohovot, Israel.

Harley, H.E., Fellner, W., Losch, B., & Feuerbach, D. (2023). Mechanisms of echoic object recognition by the bottlenose dolphin. 28th Annual International Conference on Comparative Cognition, Melbourne, FL.

Bauer, G.B., Cook, P.F., & Harley, H.E. (2023). Marine mammal cognition and conservation. 28th Annual International Conference on Comparative Cognition, Melbourne, FL.

Fellner, W., Alligood, C., Harley, H.E., & Janik, V. (2023). Relative values of food reinforcers by bottlenose dolphins. 28th Annual International Conference on Comparative Cognition, Melbourne, FL.

Honors and Awards

- Excellence in Science Communication Award for poster (2009), *Echoic Shape Discrimination by Dolphins?,* at the 18th Biennial Conference on the Biology of Marine Mammals
- *Pas si Bêtes! 1000 Cerveaux, 1000 Mondes.* (2000). An installation in the *Muséum National d'Histoire Naturelles*, Paris, France, included my work on imitation in dolphins.
- TIP Award for Exceptional Teaching (1998)

Grants

- ONR MURI Grant, Subaward Principal Investigator, *Learning from Hearing: Neurobehavioral, Physiological, and Computational Processes of Auditory Object Learning in Mammals,* 2022-2025.
- Disney Research Grant, Principal Investigator, 1996 – present.
- Disney-NCF contract, Coordinator, 2010 – present.
- New College Faculty Development Award, 1995 – 2021.
- Travel grants: USF, NCF, European Union, *Stazione Zoologica,* German Research Foundation/Office of Naval Research Global, NIMBioS, Association of Zoos and Aquariums.
- USF DSR Research & Creative Scholarship Award, Principal Investigator, 1995, 1999.
- Dolphin Aviation, 1997 (with Gordon Bauer).
- SPAWAR Systems Center - San Diego Contract N66001-98-M-1052, Principal Investigator, 1998.
- Southwest Florida Water Management District, Principal Investigator, 2003.
- Mirage Research Grant, Principal Investigator, 2003 - 2006.
- NOAA Grant to NCF, Investigator, 2002 - 2006.

Membership in Professional Societies

- Comparative Cognition Society
- International Marine Animal Trainers' Association
- Society for Marine Mammalogy
- Psychonomics Society (Fellow)
- Association of Zoos and Aquariums
- International Society for Anthrozoology
- American Psychological Association

Community Service

New College: Student Life Committee (1995-1997; 2001-2002; 2005); Statistics Committee (1996); Student Activities Coordinator Search Committee (1996); Library Committee (1997-1999); USF Strategic Planning Task Force – Honors Programs, Services, and Environment (1998); Alumnae/i Grants Committee (2001-2002); Health Fee Committee (2001-2002); Admissions Committee (2003); Institutional Review Board (2004-2005, 2006); Provost's Advisory Council (1999-2001, 2005, 2006-2008, 2014, 2019, 2020-2022); Environmental Studies Steering Committee (2002 – present); Shared-appointment Committee (2009-2010); FASC (2010-2011); Interdisciplinary Programs Committee (2014); Data Science Master's Initiative (2014); Psychology Search Committees (multiple years); Anthropology Search Committee (2018-19); Philosophy Search Committee (2018-19); and more.

Reviewer: *Journal of Comparative Psychology; Journal of Experimental Psychology: Animal Behavior Processes; Aquatic Mammals;* NSF; *Animal Cognition; Animal Behaviour; Marine Mammal Science; International Journal of Comparative Psychology*; *Natural Sciences and Engineering Research Council of Canada; Journal of the Acoustical Society of America; Zoo Biology; Journal of Comparative Physiology; PNAS; Oxford University Press; MIT Press; Chicago University Press,* and more.

Community Presentations: National Student Conference of the National Consortium for Specialized Secondary Schools of Mathematics, Science, and Technology; Golden Anchor Guest Lecture Series; Anna Maria Island Library Lecture Series; Indian Beach/Sapphire Shores Neighborhood Association; NCF Foundation Lecture Series; NCF Admissions; Pine View School; McClellan Park School; Renaissance Weekend 25th Anniversary; Anna Maria Library Teens Lecture Series; Mote Monday Night Lecture Series; G Wiz Museum of Science; Duke TIP Melodies of the Mind; Duke TIP Marine Research; Bates College Comparative Cognition; NCF Anniversary; Sarasota Newcomers' Club; Chabad Men's Club; multiple New College events (admissions, alumnae/i, celebrations) and more.

Professional Service

- Editorial Board Member: Journal of Comparative Psychology, 2023-present
- Co-editor, *Animal Cognition* Special Issue on Marine Mammal Cognition, 2022
- Co-organizer/Leader, Conference Workshop: Exploring Cognition as a Conservation Tool, Society for Marine Mammalogy, West Palm Beach, FL 2022
- IACUC Member: Lemur Conservation Foundation, Myakka City, FL, 2005-present
- DACWC Member: Disney's Animals, Science, and Environment, 2018-present
- IACUC Member: Clearwater Marine Aquarium, 2014-present
- Bishop Museum Animal Welfare Committee, Bradenton, FL, 2017-present
- Editorial Board Member: *Aquatic Mammals,* 2007-present.
- Society of Marine Mammalogy: Louis M Herman Scholarship Committee, 2019-present
- Reviewer, SUNY Purchase Psychology Program, 2022
- Reviewer, Hampshire College Cognitive Science Program, 2014
- Member, AZA Dolphin Welfare Initiative, 2014
- Advisory Board Member: Sea World's Blue World Initiative, 2014-2016
- CO3 (Student) Awards Committee, 2013-2017
- Society for Marine Mammalogy: Education Committee, 1994-2008; Conference Committee, 1994-1995
- International Marine Animal Trainers' Association: Education Committee (2007-2008)
- Florida State Science Fair Juror

Peter F. Cook, Ph.D.

September 2023

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https://scholar.google.com/citations?user=LfoEA4oAAAAJ&hl=en

EDUCATION

PhD in Psychology, University of California Santa Cruz 2013

Post-Baccalaureate in Psychology, Columbia University, NY 2007

Bachelor of Arts in Philosophy, Pomona College, Claremont CA 2003

PROFESSIONAL APPOINTMENTS

Associate Professor of Psychology, New College, Sarasota FL August 2016 – Present

Teaching a 2/2 course load covering introductory and advanced topics and laboratories in cognition, neuroscience, and comparative psychology, supervise ~5 senior research theses per year and ~8 interterm student research projects, manage a grant-funded research lab with paid undergraduate research assistants

Research Associate, Institute of Marine Sciences, UCSC 2020 – Present

Collaborate and consult on pinniped research into cognition and sensory systems and neurobiology

Post-Doctoral Research Fellow in Neuroscience, Emory University 2013 – 2016

Contributed to a series of behavioral fMRI studies with unrestrained awake dogs. Took a primary role in experimental design, behavioral training, image analysis, and writing up results for publication. Also lead a series of studies using novel post-mortem white matter imaging techniques to investigate brain networks in a range of animals (including cetaceans, pinnipeds, canids, and marsupials)

CURRENT EXTERNAL FUNDING

PI Human Frontier Science Program Grant: The Social Origins of Rhythm, **$1.4 million** 2022 – 2025

I'm one of four PIs on this grant examining the proximal (neurobiological) and distal (evolutionary) underpinnings of social vocalization and rhythm across marine mammal clades. My primary areas are brain connectivity analyses and behavioral study design.

PUBLICATIONS (*44 published peer reviewed, 1238 citations, h index = 18, i10 index = 23*)

Most Notable

2021 Henry, M., Cook, P., de Reus, K., Nityananda, V., Rouse, A., & Kotz, S. An ecological approach to measuring synchronization abilities across the animal kingdom. *Philosophical Transactions of the Royal Society of London, Series B: Biological Sciences*. **https://doi.org/10.1098/rstb.2020.0336**

2021 Cook, P. F., Hoard, V. A., Dolui, S., Frederick, B. D., Redfern, R., Dennison, S. E., ... & Inglis, B. A. An MRI protocol for anatomical and functional evaluation of the California sea lion brain. *Journal of Neuroscience Methods*, *353*, 109097.

2016 Cook, P., Spivak, M. & Berns, G. Awake Canine fMRI Predicts Dogs' Preference for Praise Versus Food. *Social Cognitive and Affective Neuroscience*, nsw102 (Altmetric impact score: **1416**, 99th percentile compared to outputs of the same age, third highest ranking from this journal)

2016 Ravignani A. & Cook, P.F. The Evolutionary Biology of Dance, Without Frills. *Current Biology*, 26, R878-R879.

2015 Cook, P., Reichmuth, C., Rouse, A., Libby, L., Dennison, S., Carmichael, O., Kruse-Elliott, K., Bloom, J., Singh, B., Fravel, V., Barbosa, L., Stuppino, J., Van Bonn, W., Gulland, F., & Ranganath, C. Spatial Memory Deficits and Disrupted Hippocampal Connectivity in Wild California Sea Lions Naturally Exposed to Domoic Acid. *Science*, 350, 1545-1547. (Altmetric impact score: **355**, 99th percentile compared to outputs of the same age)

2015 Berns, G., Cook, P., Foxley, S., Jbabdi, S., Miller, K. & Marino, L. Diffusion tensor imaging of dolphin brains reveals direct auditory pathway to temporal lobe. *Proceedings of the Royal Society Biology B,* 282. (Altmetric impact score: **91**, 98th percentile compared to outputs of the same age)

2013 Cook, P., Rouse, A., Wilson, M., & Reichmuth, R. A California Sea Lion (Zalophus Californianus) Can Keep the Beat: Motor Entrainment to Rhythmic Stimuli in a Non Vocal Mimic, *Journal of Comparative Cognition*, 127, 412–427. (**286 citations**)

All Published or in Press– Peer-Reviewed

2023 Krucik, D., Cook, P., Cathey, M., Meegan, J., Gomez, F., Van Bonn, W. & Le-Bert, C. Adult-onset epilepsy and hippocampal pathology in a California sea lion (Zalophus califorianus): A case study of suspected in utero exposure to domoic acid. NeuroToxicology, In Press.

2023 Cook, P., Huggenberger, S. & Cozzi, B. Whale Neurophysiology, Chapter in *Cetacean Physiology*, Fahlman A. & Hooker S. Eds. In Press.

2023 Jones, R., Cook, P.F., Reichmuth, C. Ronan and the Legacy of Schusterman's Sea Lions. The Journal of the Acoustical Society of America 153 A310

2022 Cook, P.F. & Berns, G. Volumetric and connectivity assessment of the caudate nucleus in California sea lions and coyotes. *Animal Cognition,* 25, 1231-1240.

2021 Henry, M., Cook, P., de Reus, K., Nityananda, V., Rouse, A., & Kotz, S. An ecological approach to measuring synchronization abilities across the animal kingdom. *Philosophical Transactions of the Royal Society of London, Series B: Biological Sciences*. **https://doi.org/10.1098/rstb.2020.0336**

2021 Cook, P. F., Hoard, V. A., Dolui, S., Frederick, B. D., Redfern, R., Dennison, S. E., ... & Inglis, B. A. An MRI protocol for anatomical and functional evaluation of the California sea lion brain. *Journal of Neuroscience Methods*, *353*, 109097.

2021 Cook, P., Reichmuth, C., & Hanke, F. D. The Mind of a Sea Lion. In *Ethology and Behavioral Ecology of Otariids and the Odobenid* (pp. 323-345). Springer, Cham.

2021 Hanke, F. D., Reichmuth, C., & Cook, P. The Sensory World of Otariids. In *Ethology and Behavioral Ecology of Otariids and the Odobenid* (pp. 305-321). Springer, Cham.

2020 Bauer, G. B., Cook, P. F., & Harley, H. E. The Relevance of Ecological Transitions to Intelligence in Marine Mammals. *Frontiers in Psychology, 11*.

2020 Delon, N., Cook, P., Bauer, G., & Harley, H. Consider the agent in the arthropod. *Animal Sentience*, *5*(29), 32.

2019 Simeone, C., Fauquier, D., Skidmore, J., Cook, P., Colegrove, K., Gulland, F., ... & Rowles, T. K. Clinical signs and mortality of non-released stranded California sea lions housed in display facilities: the suspected role of prior exposure to algal toxins. *The Veterinary Record*, *185*(10), 304.

2018 Cook, P. & Berns, G. (2018). The Degeneracy of Behavior and the Rise of Neuroimaging to Measure Affective States in Dogs. *Animal Sentience: An Interdisciplinary Journal on Animal Feeling*, Animal Sentience 3(22),3.

2018 Prichard, A., Cook, P. F., Spivak, M., Chhibber, R., & Berns, G. (2017). Awake fMRI Reveals Mechanisms of Language Comprehension in Dogs. *Frontiers in Neuroscience*, https://doi.org/10.3389/fnins.2018.00737

2018 Cook, P., Prichard, A., Spivak, M., & Berns, G. S. (2018). Jealousy in dogs? Evidence from brain imaging. *Animal Sentience: An Interdisciplinary Journal on Animal Feeling*, *3*(22), 1.

2018 De Maio, L. M., Cook, P. F., Reichmuth, C., & Gulland, F. M. (2018). The Evaluation of Olfaction in Stranded California Sea Lions (Zalophus californianus) and Its Relevance to Domoic Acid Toxicosis. *Aquatic Mammals*, *44*(3), 231-238.

2017 Cook, P. F. (2017). Studying dog emotion beyond expression and without concern for feeling. *Animal Sentience: An Interdisciplinary Journal on Animal Feeling*, *2*(14), 15.

2017 Cook, P. F., Berns, G. S., Colegrove, K., Johnson, S., & Gulland, F. (2018). Postmortem DTI reveals altered hippocampal connectivity in wild sea lions diagnosed with chronic toxicosis from algal exposure. *Journal of Comparative Neurology*, *526*(2), 216-228.

2016 Ravignani A. & Cook, P.F. The Evolutionary Biology of Dance, Without Frills. *Current Biology*, 26, R878-R879.

2016 Cook, P. F., Reichmuth, C., Rouse, A., Dennison, S., Van Bonn, B., & Gulland, F. Natural exposure to domoic acid causes behavioral perseveration in Wild Sea lions: Neural underpinnings and diagnostic application. *Neurotoxicology and Teratology*, *57*, 95-105.

2016 Rouse, A. A., Cook, P. F., Large, E. W., & Reichmuth, C. Beat Keeping in a Sea Lion As Coupled Oscillation: Implications for Comparative Understanding of Human Rhythm. *Frontiers in Neuroscience*, *10*, 257.

2016 Cook, P., Spivak, M. & Berns, G. Awake Canine fMRI Predicts Dogs' Preference for Praise Versus Food. *Social Cognitive and Affective Neuroscience*, nsw102 (Altmetric impact score: **1128**, 99th percentile compared to outputs of the same age)

2016 Berns, G., & Cook, P.F. Why did the dog walk into the MRI? *Current Directions in Psychological Science, 25, 363-369.*

2016 Cook, P.F., Spivak, M., & Berns, G. Neurobehavioral Evidence for Individual Differences in Canine Cognitive Control: An Awake fMRI Study. *Animal Cognition*, online ahead of print. *doi:10.1007/s10071-016-0983-4*

2016 Wilson, M. & Cook, P. Rhythmic Entrainment: Why Humans Want To, Fireflies Can't Help It, Pet Birds Try, and Sea Lions Have to be Bribed. *Psychonomic Bulletin & Review*, online ahead of print

2016 Cook, P., Brooks, A., Spivak, M. & Berns, G. Regional Brain Activity in Awake Unrestrained Dogs. *Journal of Veterinary Behavior*, 16, 104-112.

2015 Cook, P., Reichmuth, C., Rouse, A., Libby, L., Dennison, S., Carmichael, O., Kruse-Elliott, K., Bloom, J., Singh, B., Fravel, V., Barbosa, L., Stuppino, J., Van Bonn, W., Gulland, F., & Ranganath, C. Spatial Memory Deficits and Disrupted Hippocampal Connectivity in Wild California Sea Lions Naturally Exposed to Domoic Acid. *Science*, 350, 1545-1547.

2015 Berns, G., Cook, P., Foxley, S., Jbabdi, S., Miller, K. & Marino, L. Diffusion tensor imaging of dolphin brains reveals direct auditory pathway to temporal lobe. *Proceedings of the Royal Society Biology B*, 282. (Altmetric impact score: **86**, 98th percentile compared to outputs of the same age)

2015 Dilks, D., Cook, P., Weiller, S., Berns, H., Spivak, M & Berns, G. A specialized region in dog temporal cortex for face processing. *PeerJ* 3: e1115 https://dx.doi.org/10.7717/peerj.1115. (Altmetric impact score: **151**, 99th percentile compared to outputs of the same age)

2014 Cook, P., Spivak M. & Berns, G. One Pair of Hands is Not Like Another: Caudate BOLD response in dogs depends on signal source and canine temperament. *PeerJ* 2: e596 https://dx.doi.org/10.7717/peerj.596 (Altmetric impact score: **18**, 92nd percentile compared to outputs of same age)

2013 Cook, P., Rouse, A., Wilson, M., & Reichmuth, R. A California Sea Lion (Zalophus Californianus) Can Keep the Beat: Motor Entrainment to Rhythmic Stimuli in a Non Vocal Mimic, *Journal of Comparative Cognition*, 127, 412–427.

2013 Van Bonn, W., Dennison, S., Cook, P., Fahlman, A. Gas Bubble Disease in the Brain of a Living California sea lion (Zalophus californianus), *Frontiers in Physiology*, *4*, 1-6.

2011 Van Bonn, W., Montie, E., Dennison, S., Pussini, N., Cook, P., Greig, D., Barakos, J., Colgrove, K., and Gulland, F. Evidence of Injury Caused by Gas Bubbles in a Live Marine Mammal: Barotrauma in a California Sea Lion (Zalophus californianus), *Diseases of Aquatic Organism*, 96, 89–96.

2011 Cook, P., Reichmuth, C., and Gulland, F. Rapid behavioural diagnosis of domoic acid toxicosis in California sea lions. *Biology Letters*, 7, 536–538.

2010 Cook, P. & Wilson, M. Do young chimpanzees have extraordinary working memory? *Psychonomic Bulletin and Review*, 4, 599-600.

Published – Other

2013 Cook, P. Ronan Fights Back. Column for *Scientific American's The Thoughtful Animal* http://blogs.scientificamerican.com/thoughtful-animal/2013/04/18/ronan-fights-back-scrappy-sea-lion-might-reclaim-the-title-of-first-non-human-dancer/

2011 Cook, P., Bernard, A., Reichmuth, C. Which way did I go? Remote training of a spatial memory task to assess the effects of domoic acid exposure in stranded California sea lions (*Zalophus californianus*). *Soundings*.

2010 Cook, P. & Wilson, M. In Practice, Chimp Memory Study Flawed. Letter in *Science.* June, 1228.

In Preparation/submitted (*student co-author)

Cook, P.F., Gray, P., Pena-Guzman, D.M., & Willet, C. The S.P.A.C.E. Model of Laboratory Science: Animals as Co-Participants in the Research Process (in revision)

Athanassiades, K., Prichard, A., Cook, P.F & Berns, G. An MRI and DTI Brain Atlas for the Coyote (Canis latrans) with Comparison to the Dog (submitted)

Michal, I.*, Inglis, B., Schmidt, T., Cook, P.F. Longitudinal Volumetric Comparison of Hippocampal Volume in a Captive Fur Seal With Long-Term Domoic Acid Toxicosis (Submitted)

Flem, S.*, Inglis, B., Deacon, T., Tyack, P., Berns, G., & Cook, P. Laterality of ascending and descending auditory tracts in toothed and baleen whales assessed by post-mortem diffusion imaging (in preparation)

Bauer, G., Harley, H. & Cook, P.F. Cognition and Conservation in Marine Mammals (in preparation)

Cook, P.F., Foltz, A., Hinton, C.* Behavioral flexibility in the American river otter (in preparation)

Cook, P.F., Sawyer, E., Rouse, A., Casey, C., Reichmuth, C., & Berns, G. Brain Organization of Vocal Learning and Non-Learning Pinnipeds (In preparation)

Ferguson, Q.* and Cook, P. Diffusion Tensor Mapping of Oxytocinergic Projections from the Hypothalamus in Domestic Dogs and Coyotes (In preparation)

EDITORSHIP

Just offered editorial position at Frontiers of in Behavioral Neuroscience

Co-editor of a special issue for peer reviewed journal *Animals*: Novel approaches to Comparative Study of Human and Animal Emotions, to be published 2023

Handling Editor for Frontiers of Biology

GRANTS AND FELLOWSHIPS

PI Human Frontier Science Program Grant: The Social Origins of Rhythm, **$1.4 million**	2022 - 2025
New College Florida Faculty Summer Development Award	2016 - 2019
Post-doctoral Research Fellowship, Emory University	2013 - 2016
Funded by Office of Naval Research	
Co-investigator, Packard Ocean Sciences grant, $18,000, UCSC	2011 - 2012
Co-investigator, Packard Ocean Sciences grant, $20,000, UCSC	2010 - 2011
National Science Foundation Graduate Research Fellow, $120,000, UCSC	2008 - 2011
External Collaborator, Oceans and Human Health Program	2008 - Present
Funded by National Oceanic and Atmospheric Association	

GRANT APPLICATIONS 2016-2021

University of California Multicampus Research Funding Opportunities proposal:Domoic acid poisoning and epilepsy in California sea lions

NMFS ECOHAB proposal for developmental work with juvenile sea lions naturally exposed to algal toxin domoic acid *in utero*

Templeton Foundation proposal for work examining the evolutionary trail of beat keeping with primates and cetaceans

NSF proposal for rhythm research with bonobos

Australian Research Council proposal to study effects of algal toxins on wild cetaceans

HONORS AND AWARDS

Green Neuroscience Award – Society for Neuroscience	2017
Dean’s award for best presentation – UCSC Graduate Research Symposium	2012
UCSC summer dissertation writing fellowship	2012
UCSC summer research fellowship in Psychology	2011
Earl and Ethel Myers Oceanographic Trust Award	2009
Friends of Long Marine Lab, Student Research Grant	2008

National Science Foundation Graduate Research Fellowship 2008 - 2011

INVITED PRESENTATIONS

2023 Jones, R.; Cook P.F.; Reichmuth, C.R. Ronan and the Legacy of Schusterman's California Sea Lions. Annual Meeting of the American Acoustical Society, Chicago, IL, May 2023

2023 Cook, P.F. Auditory Connectivity in Phocid Brains – Presentation for MURI Grant Symposium

2021 Cook, P.F. Unrestrained Brain Imaging in Domestic Dogs –Presentation for Dr. Frederike Hanke's Integrative Biology Lab, University of Rostock

2019 Cook, P.F. Vocal Learning Circuits in Pinnipeds and Their Relevance to Understanding Rhythmic Behavior in Non-Human Animals. Neurons to Ecology, The Lorentz Center, Leiden, Netherlands, July 2019

2018 Alternative Models for Comparative Neuroscience Research – Whitman College, Walla Walla WA, November 2018

2017 Cook, P.F. Wild Sea Lions as a Model for Human Disease. At AQMHD at University of Alabama at Birmingham.

2016 Cook, P.F., Rouse, A., Berns, G., Large, E. & Reichmuth, C. Human-Like Entrainment in a Vocal Non-Learner. At ICMPC in San Francisco, July

2015 Cook, P., Brooks, A., Spivak, M. & Berns, G. Regional Brain Activity in Awake Unrestrained Dogs. Canine Behaviour and Genetics Meeting, London, June

2014 Cook, P. Sea Lions Can Keep the Beat: Auditory Motor Entrainment in a Vocally Inflexible Species. In: Rhythmic Entrainment in Non-Human Animals: An Evolutionary Trail of Time Perception, AAAS Annual Meeting, Chicago, February

2013 Cook, P. Memory and Functional Connectivity in Wild Sea Lions with Naturally Occurring Hippocampal Damage, Emory University

2011 Cook, P., Reichmuth, C., and Gulland, F. A Behavioral Assay for Diagnosing Domoic Acid Toxicosis in Stranded California Sea Lions, International Symposium on Advanced Studies by Young Scientists on Environmental Pollution and Ecotoxicology, Ehime, Japan, August

2011 Cook, P., Reichmuth, C., and Gulland, F. Auditory Habituation as a Diagnostic Measure of Domoic Acid Toxicosis in Wild Sea Lions, 161st Meeting of the Acoustical Society of America, Seattle, Washington, May

2011 Blascow, M. & Cook, P. Domoic acid toxicosis: Observations on treatment and learning and implications for training. International Marine Animal Training Association (IMATA) Southwest Regional Conference, Vallejo, California, May

OTHER CONFERENCE PRESENTATIONS

2022 Harley, H., Bauer, G & Cook, P. Cognition as a Tool in Marine Mammal Conservation. Workshop Leads, Society for Marine Mammalogy, West Palm Beach, FL

2016 Cook, P. et al. The neurobehavioral effects of naturally occurring domoic acid toxicosis in wild California sea lions. Oral presentation at the 23rd Annual Comparative Cognition Conference, Melbourne, FL, April

2016 Pritchard, A., Cook, P., Spivak, M. & Berns, G. You or the Food? Canine Preferences and Violation of Expected Outcomes. Poster presentation at the 23rd Annual Comparative Cognition Conference, Melbourne, FL, April

2016 Rouse, A., Cook, P., Reichmuth, C. & Large, E. Beat Keeping in Sea Lion as Coupled Oscillation: Implications for Comparative Understanding of Human Rhythm. Workshop presentation at Evolang, New Orleans, LA

2015 Cook, P., et al. The neurobehavioral effects of naturally occurring domoic acid toxicosis in wild California sea lions. Oral presentation at the 21st Biennial Conference on Marine Mammals, San Francisco, CA, December

2015 Cook, P., et al. Diffusion tensor imaging of dolphin brains reveals direct auditory pathway to temporal lobe. Oral presentation by co-author at the 21st Biennial Conference on Marine Mammals, San Francisco, CA, December

2015 Dilks, D., Cook, P., Willer, S., Berns, H., Spivak, M. & Berns, G. Awake fMRI reveals a specialized region in dog temporal cortex for face processing. Poster presentation by co-author at Society for Neuroscience's 45th Annual Meeting, Chicago, IL, October

2014 Cook, P., Rouse, A., Libby, L., Reichmuth, C., Ranganath, C. & Gulland, F. Disrupted Hippocampal Connectivity in Wild Sea Lions Exposed to an Algal Neurotoxin. Poster presentation at the 4th Biennial Conference on Resting State/Brain Connectivity, MIT, Cambridge, MA, September

2014 Cook, P., Spivak, M. & Berns, G. Functional Connectivity of the Canine Caudate During Reward Prediction. Poster presentation at the 4th Biennial Conference on Resting State/Brain Connectivity, MIT, Cambridge, MA, September

2013 Cook, P., Rouse, A., Wilson, M., and Reichmuth, C. Sea Lions Can Keep the Beat: Rhythmic Entrainment in a Vocally Inflexible Species. Oral presentation by co-author at the 20th Biennial Meeting of the Society for Marine Mammalogy, Dunedin, New Zealand, December

2013 Cook, P., Reichmuth, C., and Gulland, F. Delayed alternation in wild California sea lions with naturally occurring hippocampal damage. Poster presentation at the 20th Annual Meeting of the Cognitive Neuroscience Society, San Francisco, CA, April

2012 Cook, P., Rouse, A., Wilson, M., and Reichmuth, C. Sea Lions Can Keep the Beat: Rhythmic Entrainment in a Vocally Inflexible Species. Poster presentation at the Psychonomic Society 53rd Annual Meeting, Minneapolis, Minnesota, November

2012 Cook, P., Reichmuth, C., and Gulland, F. Delayed alternation in wild California sea lions with naturally occurring hippocampal damage. Oral presentation at the 9th Bay Area Memory Meeting, UC Davis, April

2012 Cook, P., Rouse, A., Wilson, M., and Reichmuth, C. Rhythmic entrainment in a California sea lion (Zalophus californianus). Oral presentation by co-author at the 19th Annual International Conference on Comparative Cognition, Melbourne Beach, Florida, March

2010 Cook, P, and Reichmuth C. Delayed alternation by California sea lions with naturally occurring hippocampal damage. Oral presentation at the 17th Annual International Conference On Comparative Cognition, Melbourne Beach, Florida, March

2009 Cook, P. & Wilson, M. Do Young Chimpanzees have extraordinary working memory? Poster presentation at the Psychonomic Society 50th Annual Meeting, Boston, Massachusets, November

2009 Cook, P., Bernard, A., Reichmuth, C. Which way did I go? Remote training of a spatial memory task to assess the effects of domoic acid toxicosis in stranded California sea lions (Zalophus californianus). Oral presentation by co-author at the 37th Annual Conference of the International Marine Animal Trainers Association (IMATA), Atlanta, Georgia, April. Received: Editor's Choice Award and ATAC Award.

2009 Cook, P., Reichmuth, C., and Schusterman, R.J. Habituation of an orienting response to auditory stimuli in California sea lions (Zalophus californianus) exhibiting symptoms of domoic acid toxicosis. Poster presentation at the 18th Biennial Conference on the Biology of Marine Mammals, Quebec City, Canada, October

2009 Cook, P. Novel Brain and Behavior Research in Wild Sea Lions With Naturally Occurring Brain Damage, Oral presentation at the Bay Area Memory Meeting, San Francisco, California, August

2009 Cook, P. & Wilson, M. Do Young Chimpanzees have extraordinary working memory? Poster presentation at the Bay Area Memory Meeting, San Francisco, California, August

CAMPUS OR DEPARTMENTAL TALKS

2023 Neural Connectivity in Dolphins – Research talk for NCF interdisciplinary course in museum sciences

2021 Training Wild Animals – Research talk for NCF Goldfish Lab

2017 Studying Behavioral Flexibility in Non-Human Animals – Research talk for NCF Psychology Club

2017 Embodied Cognition in Action – Dance for Parkinson's Symposium at New College

2016 Cook, P.F. Et al. A Natural Model for Studying Domoic Acid, Ecotoxicology Seminar, April

2015 Cook, P. Alternative Models for Cognitive Neuroscience, Emory University Post-Doctoral Symposium, March

2014 Cook, P., Dilks, D., Weiller, S., Berns, H., Spivak, M & Berns, G. Analog to Primate Face Patches in the Domestic Dog, Emory University Cognitive and Development Speaker Series, October

2013 Cook, P., Rouse, A., Wilson, M., and Reichmuth, C. Sea Lions Can Keep the Beat: Auditory Motor Entrainment in a Vocally Inflexible Species, UCSC's Cognitive area Psychology Colloquium, March

2013 Cook, P., Reichmuth, C., and Gulland, F. Delayed alternation in wild California sea lions with naturally occurring hippocampal damage. EEB Graduate Symposium, University of California Santa Cruz, April

2012 Cook, P., Rouse, A., Wilson, M., and Reichmuth, C. Rhythmic entrainment in a California sea lion (Zalophus californianus). 2012 UCSC Graduate Research Symposium Received: Dean's Award for best presentation

2011 Cook, P. Functional dissociations in the medial temporal lobe: Historical perspective and a novel, naturalistic lesion model. UCSC's Cognitive area Psychology Colloquium, March

COMMUNITY TALKS

2017 Cook, P.F. Decision Making and the Brain. Talk for Flagship Living of Sarasota.

2014 Cook, P. Sea lions keep the beat. Oral presentation at Nerd Nite Atlanta, GA, March

2011 Cook, P. The cognitive effects of domoic acid toxicosis in California sea lions. The Marine Mammal Center's "Meet the Scientist" monthly series, Sausalito, California, April

COURSES TAUGHT AT NEW COLLEGE OF FLORIDA

Advanced Topics in Cognitive Neuroscience

Cognitive Neuroscience

Biological Psychology

Introductory Psychology – Perception and Action

Introductory Psychology – The Embodied Mind

Brain Anatomy Laboratory

Brain Connectivity Laboratory

Curiosity in Humans and Other Animals

Rhythm in Brain and Behavior

Ecologically Valid Study Design in Psychological Science

Dance, Brain and Parkinson's

Psychology Senior Seminar

STUDENT TUTORIALS SUPERVISED

Deception

Neuroscience and Meditation

Neuroeconomics

Language in the Brain

Movement

Advanced Topics in Cognitive Neuroscience

PRIOR TEACHING EXPERIENCE

Instructor, UCSC

Cognitive Neuroscience Summer 2013

Designed and sole-taught new course for Psychology Department.

Teaching Assistant, UCSC

Infant Development, guest lecture Winter 2013

Developmental Psychopathology, 2 weekly sole-taught sections Fall 2012

Cognitive Psychology, 2 weekly sole-taught sections Spring 2012

Psychology Statistics, 2 weekly sole-taught sections Winter 2012

Perception, guest lecture Winter 2011

Perception, 2 weekly sole-taught sections Winter 2008

Personality Psychology, 2 weekly sole-taught sections Fall 2007

Guest Lectures, UCSC

Studying memory in human infants Winter 2013

Memory in non-human animals Fall 2012

Perception in non-human animals Winter 2011

Instructor, youth program "Girlstart," Austin, TX Summer 2010

Used online tools to teach elementary-age girls about science, using hands on demonstrations with sea lions

Instructor, youth program "Ocean Explorers," Seymour Marine Discovery Center Summer 2008

Led hands-on science programs for children ages 7-14, focused on education and participation in marine mammal research

Mentoring, Pinniped Cognition and Sensory Systems Lab 2007 to 2013

Helped supervise the participation of 15+ undergraduate students per year (over 50 in total) at the Pinniped Cognition and Sensory Systems Laboratory at UCSC's Long Marine Lab. Students engage in laboratory and field research, working 15+ hours per week for at least one year. All students complete an intensive academic and applied training program and many complete independent research projects or senior theses in the laboratory. Mentored 1–2 interns per year who worked closely with me on my dissertation research.

Dissertation Advisor 2010

Helped oversee Masters dissertation at St. Andrews University in Scotland: The evaluation of olfaction in stranded California sea lions (Zalophus californianus) exposed to domoic acid toxicity, completed 2010

UNIVERSITY SERVICE

Member, Student Academic Status Committee, NCF Spring 2023-Present

Board Member, New College Child Care Center Fall 2023

Steering Committee, Chart Your Course (GenEd Requirements), NCF Fall 2021

Steering Committee, Environmental Studies, New College of Florida 2020-Present

Steering Committee, Neuroscience Area of Concentration, New College of Florida 2018-Present

Search Committee Member, New College of Florida 2017

Two searches, both successful: Human Neuroscience and Human Computer Interaction

Seymour Marine Discovery Center at University of California Santa Cruz 2007 - 2013

Regular demonstrations on pinniped behavior, biology, and ongoing research

UNIVERSITY TRAINING

New College CITI training in research ethics, Emory University Training Course on Animal Care and Use, UCSC Training Course on Animal Care and Use, UCSC Research Ethics Training Course

PRIOR RESEARCH POSITIONS

Graduate Student Researcher 2007 - 2013

Pinniped Cognition Lab, Institute of Marine Sciences, UCSC

Visual and Embodied Cognition Laboratory, UCSC

Research Assistant 2005 - 2006

Primate Cognition Laboratory, Columbia University, NYC

Walrus Communication Laboratory, Hunter College and Coney Island Aquarium, NYC

AD-HOC REVIEWING

Current Biology, Nature Communications, Journal of Comparative Psychology, Neuropsychologia, Behavioural Processes, Zoo Biology, PeerJ, International Journal of Comparative Psychology, Music Perception, Journal of Brain and Behavior, Journal of Comparative Neuroscience,

MEDIA COVERAGE

Video, Beat Keeping in a California Sea Lion, viewed over one million times - https://www.youtube.com/watch?v=6yS6qU_w3JQ

Interview, with Scott Simon on NPR's Weekend Edition, Sea Lion Keeps the Beat in Pursuit of Science, April 6, 2013 - http://www.npr.org/2013/04/06/176419135/sea-lion-keeps-the-beat-in-pursuit-of-science

Interview, with Susanne Malveaux on CNN's Newsroom, regarding rhythm work, April 3, 2013

Interview, with Amy Standen on KQED – NPR San Francisco, regarding rhythm work, April 2, 2013

Interview, with Carol Off on CBC's As It Happens, regarding rhythm work, April 5, 2013

Interview, with Kiet Do on CBS San Francisco, regarding rhythm work, April 2, 2013

Coverage, regarding sea lion rhythm work: ABC, NBC, CBS, BBC, Daily Mail, San Francisco Chronicle, Wired, Slate, The Verge, Google News

Work with wild sea lions featured on NPR's Science Friday - http://www.sciencefriday.com/segments/stranded-sea-lions-warming-lakes-and-floating-schools/

Interview with Beth Ruyak on Capital Public Radio, NPR Sacramento, regarding work with wild sea lions - http://www.capradio.org/61898

Featured, in Liz Cunningham's book *Ocean Country* for my work with wild sea lions

Coverage, regarding work with wild sea lions: Science and Nature news, National Geographic, Washington Post, San Francisco Chronicle, Newsweek, The Guardian, Daily Mail, Discover Magazine,

Coverage, regarding dog imaging work: 60 Minutes with Anderson Cooper, The New York Times, Time, Rolling Stone, Wired

NON-ACADEMIC WORK

Senior Editor, Psychiatry Weekly, NYC 2006 - 2007

Responsible for writing and editing content for weekly Psychiatry publication distributed to over 600 hospitals nation-wide

PROFESSIONAL ASSOCIATIONS

Cognitive Neuroscience Society, Comparative Cognition Society, Acoustical Society of America, Psychonomic Society, Society for Marine Mammology

REFERENCES

Gregory Berns, MD, PhD
Professor, Psychology, Emory University
36 Eagle Row
Atlanta, GA 30322
gberns@emory.edu - 404-561-8551

Charan Ranganath, PhD
Professor, Psychology, University of California Davis
1 Shields Avenue
Davis, CA 95616
cranganath@ucdavis.edu - 530-220-3269

Colleen Reichmuth, PhD
Research Scientist, University of California Santa Cruz
Long Marine Laboratory
100 Shaffer Rd.
Santa Cruz, CA 95060
coll@ucsc.edu - 831-419-3017

Gordon Bauer
Professor Emeritus of Psychology
New College of Florida
Sarasota, FL 34234
bauer&ncf.edu

ATHENA RYCYK

New College of Florida, 5800 Bay Shore Rd., Sarasota, FL 34243 · arycyk@ncf.edu

EDUCATION

2013 **Ph. D. in Biological Oceanography** (Florida State University, advisor Doug Nowacek)
Dissertation Foci: 1) Modeling factors that affect manatee reactions to boats 2) Acoustic cues in boat noise that affect a manatee's response to boats 3) Comparison to manatees with less exposure to boats (Belize)

2007 **M.S. in Biological Oceanography** (Florida State University, advisor Doug Nowacek)
Thesis Foci: 1) Vocal behavior of two bottlenose dolphin (*Tursiops truncatus*) communities in the Big Bend region of Florida 2) Soundscapes in the Big Bend region of Florida: dolphin, fish, and anthropogenic sounds

2004 **B. A. in Biological Psychology** (New College of Florida)
Thesis: Manatee Psychophysical Testing: Are results biased by sequence learning?

FACULTY APPOINTMENTS

2023–current **New College of Florida** (Associate Professor of Biology and Marine Science)
2023–current **New College of Florida** (Director of the Quality Enhancement Program that uses First Year Seminars to support student success)
2018–2023 **New College of Florida** (Assistant Professor of Biology and Marine Science)
2014–2018 **Eckerd College** (Adjunct, CPT, Visiting Assistant Professor of Marine Science)
2016–2017 **University of Southern Mississippi** (Visiting Associate Graduate Faculty)
2015–2016 **New College of Florida** (Adjunct Assistant Professor)

RESEARCH APPOINTMENTS

2017–current **Mote Marine Laboratory** (Adjunct Scientist)

COURSES TAUGHT (FALL/SPRING)

2015–current **New College of Florida**
- Analysis of Florida Manatee Mortality Events
- Animal Behavior Lecture x 2
- Animal Behavior Laboratory x 2
- First Year Seminar: The Inquisitive Scientist
- Foundations of Biology I
- General Biology
- Introduction to Environmental Studies
- Marine Ecology Laboratory x 2
- Marine Mammal Behavior
- Marine Mammal Biology x 2
- Research Methods in Biology x 2

2014–2018 **Eckerd College**
- Biological Oceanography Lecture x 7
- Biological Oceanography Laboratory x 13

Introduction to Environmental Science x 3
Marine Ecology Senior Seminar
Marine Mammal Science x 2
Principles of Ecology

2012–2013 **Florida State University**
Environmental Science Capstone
Environmental Science and Policy Capstone

COURSES TAUGHT (WINTER TERM)

2019 **New College of Florida: Acoustical Ecology of Sarasota Bay**
Students learned about acoustics and soniferous species in Sarasota Bay, created a sound identification guide, an auditing protocol, and audited recordings from Sarasota Bay. Field trips included Loggerhead Instruments (developer of acoustic recorders), Weeki Wachee to kayak with and observe manatees, and the Manatee Viewing Center at the Big Bend Power Station in Apollo to observe manatees at a warm-water site.

2018 **Eckerd College: Natural History of the Galapagos Islands and Ecuador**
This course included three weeks in Ecuador, exploring a cloud forest, rainforest, tundra, and the Galapagos. It was a rigorous expedition across many ecosystems that provided students with the opportunity to study and contrast the unique biodiversity in these environments.

2016–2017 **University of Southern Mississippi: Sirenian Biology** x 2 (Gulf Coast Research Laboratory)
These courses attracted students from around the country and included trips across Florida to study manatees in the wild and participate in a manatee necropsy.

TUTORIALS TAUGHT (examples)

Alligator Behavior Manuscript Revisions, Dolphin Acoustic Analysis, Advanced analyses of manatee body condition, African Manatee Vocalizations, Scientific Writing on Comparative Alligator Social Behaviors, Introduction to MATLAB with a focus in marine bioacoustics, Otter Behavior and Biology, Sirenian Vocal Behavior with Art, and Sarasota Bay Soundscapes

INDEPENDENT STUDY PROJECTS SUPERVISED (examples)

Bird Surveys of Crystal River, Behavior of Captive and Wild Antillean Manatees, Observing Social Interactions Within Captive and Wild Alligator Congregations, Bioacoustic Analysis in R, Carefree Learner, Experimental Methods in Otter Vocal Behavior, Genotyping Lemon Shark DNA, A Game of Situational Awareness of Manatees and Boats, Development of a Classification of Spatial Overlap in Algae and Vibrissa in Manatees, and Acoustic Ecology of Sarasota Bay

FUNDED PROPOSALS

2021 **Rycyk, Athena,** $14,985, Sarasota Bay Dolphin Acoustics, Financial support for interns in summer 2021 from the Environmental Discovery Award Program (Cross College Alliance)

2020 **Rycyk, Athena,** $8,500, Acoustic analysis of aquatic, sound-producing organisms, Financial support for interns in summer 2020 from the Environmental Discovery Award Program (Cross College Alliance)

2018 **Rycyk, Athena** and Leininger, Elizabeth, $3,900, Acoustic analysis software for undergraduate students, Women's Giving Circle

2015 Co-Investigator (Bauer, Gordon (PI), **Rycyk**, **Athena**, and Cardwell, Adrienne), $32,300, Underwater Behavioral Audiograms of Sea Turtles: Green (*Chelonia mydas*) and Kemp's Ridley (*Lepidochelys kempii*) Turtles, Clearwater Marine Aquarium

PUBLICATIONS

Undergraduate student authors are underlined
Graduate student authors are underlined and have an *

2023 *Factheu, C., **Rycyk A.,** Sévilor, K., Keith-Diagne, L., Ramos, E. A., Kikuchi, M., and Takoukam Kamla, A. *Acoustic methods improve the detection of the endangered African manatee*, Frontiers in Marine Science, 9:1032464, https://doi.org/10.3389/fmars.2022.1032464

2022 **Rycyk, Athena**, Bolaji, Dunsin, *Factheu, Clinton, and Takoukam, Aristide *Using transfer learning with a convolutional neural network to detect African Manatee (Trichechus senegalensis) vocalizations*, JASA Express Letters, 2(12), 121201, https://doi.org/10.1121/10.0016543
Editor's pick and featured on the cover

2022 *Longden, E. G., Gillespie, D., Mann, D. A., McHugh, K. A., **Rycyk, A. M.,** Wells, R. S., & Tyack, P. L. *Comparison of the marine soundscape before and during the COVID-19 pandemic in dolphin habitat in Sarasota Bay, FL*, J. Acoust. Soc. Am., 152, 3170–3185, https://doi.org/10.1121/10.0015366

2022 **Rycyk, Athena M**., Berchem, Cora, and Marques, Tiago A. (2022) *Estimating Florida manatee (Trichechus manatus latirostris) abundance using passive acoustic methods*, JASA Express Letters, 2(5), 051202, https://doi.org/10.1121/10.0010495

2022 **Rycyk, A. M.**, Bauer, G. B., Wells, R. S., Gaspard III, J. C., & Mann, D. A. (2022) *The influence of variations in background noise on Florida manatee (Trichechus manatus latirostris) detection of boat noise and vocalizations*, PLoS ONE, 17(5), e0268513, https://doi.org/10.1371/journal.pone.0268513

2022 Walsh, Zane C., Olson, Hannah, Clendening, Miranda, and **Rycyk, Athena M.** (2022) *Social Behavior Deficiencies in Captive American Alligators (Alligator mississippiensis)*, Journal of Zoological and Botanical Gardens (Featured Paper), 3, 131–146, https://doi.org/10.3390/jzbg3010011, [special issue: Fundamental Knowledge on Forgotten Species: An Exploration of Data from Rarely Studied Captive Animals]

2021 **Rycyk, Athena**, Factheu, Clinton, Angel Ramos, Eric, Brady, Beth, Kikuchi, Mumi, Nations, Hannah, Kapfer, Karianne, Hampton, Cecilia, Garcia, Emily, and Kalma Takoukam, Aristide. *First characterization of vocalizations and passive acoustic monitoring of the vulnerable African manatee (Trichechus senegalensis)*. J. Acoust. Soc. Am., 150, 3028–3037. https://doi.org/10.1121/10.0006734

2021 **Rycyk, Athena** *Florida Manatee (Trichechus manatus latirostris) mortality from boat collisions*. Isana 74: 7–14. [an **invited** paper for a marine mammal oriented academic association in Japan; not peer-reviewed]

2020 **Rycyk, Athena M.***, Tyson Moore, Reny B.*, Wells, Randall S., McHugh, Katherine A., Berens McCabe, Elizabeth J., & Mann, David A. *Passive acoustic listening stations (PALS) show rapid onset of ecological effects of harmful algal blooms in real time*. Scientific Reports, 10:17863. https://doi.org/10.1038/s41598-020-74647-z
*Co-first authors

2018 **Rycyk, Athena M.**, Deutsch, Charles, J., Barlas, Margaret E., Hardy, Stacie, Frisch, Katherine, Leone, Erin H., & Nowacek, Doug P. *Manatee behavioral responses to boats*. Marine Mammal Science, 34: 924-962. https://doi.org/10.1111/mms.12491
Among the top 10% most downloaded papers from the journal between January 2018 and December 2019

2016 Martin, Julien, Sabatier, Quentin, Gowan, Timothy A., Giraud, Christophe, Gurarie, Eliezer, Calleson, C. Scott, Ortega-Ortiz, Joel G., Deutsch, Charles J., **Rycyk, Athena M.**, & Koslovsky, Stacie (2016) *A quantitative framework for investigating risk of deadly collisions between marine wildlife and boats*. Methods in Ecology and Evolution 7: 42-50. https://doi.org/10.1111/2041-210X.12447

MANUSCRIPTS IN PREPARATION

In prep Bauer, G., Cook, P., Harley, H., . . . **Rycyk, A.** . . . Exploring Marine Mammal Cognition as a Conservation Tool (fully drafted)

In prep Brady, B., **Rycyk, A.**, Ichikawa, K., Ramos, E., Factheu, C., and Sousa-Lima, R. Title TBD, a book chapter on Sirenian vocal behavior and ecological applications In: Hines, E. et al. Sirenian Conservation (fully drafted)

In prep *Factheu, C., **Rycyk, A**. Kekeunou, S., Takoukam, A., Ramos, E., Kikuchi, M., and Keith-Diagne, L. Working title: *Passive Acoustic Monitoring reveals manatees' occurrence pattern and Giant Salvinia negative influence of their habitat use in Lake Ossa, Cameroon*, In progress (fully drafted)

In prep Quirós-Corella, F., Mora-Ramirez, S., **Rycyk, A. M.** et al. Working title: *Benchmarking an automatic manatee count algorithm using field audio data and vocalization recordings*, In progress (data have been collected and analysis is ongoing)

In prep **Rycyk, Athena M.**, Reep, Roger, Gaspard, Joe, Colbert, Debborah E., Nowacek, Doug, Deutsch, Charles, Mann, David, & Bauer, Gordon. Working title: *Manatee hearing and collisions with boats*. (fully drafted)

In prep **Rycyk, AM**, Skinner, J, Ryba, TR, & Erdsack, N. *Macro-epibiont growth on wild Florida manatee (Trichechus manatus latirostris)*. (fully drafted)

REPORTS

2023 Wood-Barron, H. and **Rycyk, A.** Croc Calls: How American and Morelet's Crocodile Vocalizations Differ in Structure, Crocodile Specialist Group's Student Research Assistance Scheme Report

2009 Deutsch, C. J., **Rycyk, A. M.**, Barlas, M. E., Nowacek, D. P., Koslovsky, S. M.

& Frisch, K. Response of manatees to vessel traffic: Simultaneous measurements of behavioral responses and the acoustic environment. Final Progress Report to Florida Fish and Wildlife Conservation Commission. Project Contract No. 021426 to Florida State University. 111 pp.

PRESENTATIONS

Undergraduate student authors are underlined
Graduate student authors are underlined and have an *

Accepted — Wood-Barron, H., Rycyk, A., Triminion, J., and Tellez, M. (2024) Crocodile talk: structural analysis of American and Morelet's crocodile vocalizations in Belize, Abstract submitted to The Society for Integrative and Comparative Biology Meeting

2023 — Harley, Heidi E., Larkin, Iske V., Bauer, Gordon B., and **Rycyk, Athena** Has the time come to create a Manatee Science and Conservation Consortium to coordinate and support manatee research?, Abstract submitted to the 6th Manatee Research Symposium

2023 — **Rycyk, Athena**, Bolaji, Dunsin, *Factheu, Clinton, Christogonus, Ejimadu, and Takoukam, Aristide, A Detecting African Manatee (*Trichechus senegalensis*) Vocalizations: Harnessing Transfer Learning with a Convolutional Neural Network, Abstract submitted to the 6th Manatee Research Symposium

2023 — Kim Bassos-Hull, Krystan A. Wilkinson, Breanna C. DeGroot, Matthew J. Ajemian, Hannah El Halabi, **Athena Rycyk**, Atlantine Boggio-Pasqua, Jayne M. Gardiner, Ryan Schloesser, & Ernesto Lasso de la Vega Monitoring white spotted eagle ray behavior in shellfish restoration sites in Sarasota Bay, Florida USA, 6th International Conference on Fish Telemetry will take place in Sète, France, from 11-16 June 2023

2023 — Thompson, C., McHugh, Katherine, Wells, R., **Rycyk, A**., & Mann, D. Listening in with the dolphins: Baseline monitoring of the underwater soundscape in Sarasota Bay, Florida, Southeast and Mid-Atlantic Marine Mammal Symposium

2022 — **Rycyk, Athena**, Bolaji, Dunsin, *Factheu, Clinton, and Takoukam, Aristide, A Convolutional Neural Network for Detecting Acoustic Presence of African Manatees in Lekki Lagoon, Nigeria, 3rd African Bioacoustics Community Conference (presented by Clinton Factheu)

2022 — *Factheu, Clinton, **Rycyk, Athena**, Takoukam, Aristide, Kekeunou, Sévilor, Ramos, Eric, Kikuchi, Mumi, and Keith-Diagne, Lucy, African manatee (*Trichechus senegalensis* Link, 1795) detection in Lake Ossa, Cameroon: comparing point-scan, active and passive acoustic monitoring, 3rd African Bioacoustics Community Conference

2022 — **Athena Rycyk**, *Clinton Factheu, Eric Angel Ramos, Beth Brady, Mumi Kikuchi, Hannah Nations, Karianne Kapfer, Cecilia Hampton, Emily Garcia, and Aristide Takoukam Kamla, First Characterization of African Manatee (*Trichechus senegalensis*) Vocalizations, 24th Biennial Conference on the Biology of Marine Mammals

2022 — Gordon Bauer, **Athena Rycyk**, Roger Reep, and David Mann, Manatee Cognition, Psychophysics, and Conservation, 24th Biennial Conference on the Biology of Marine Mammals

2022 — Nicola Erdsack, **Athena Rycyk**, Jessica Skinner, Tyrone Ryba, and John E. Reynolds, Relevance of severe macro-epibiont growth on the skin of Florida manatees (*Trichechus manatus latirostris*), 24th Biennial Conference on the Biology of Marine Mammals

2022 *Clinton Factheu, **Athena Rycyk**, Eric Angel Ramos, Mumi Kikuchi, Beth Brady, Aristide Takoukam Kamla, Lucy Keith-Diagne, Preliminary findings: Assessing the impact of giant *salvinia* invasion on the African manatee distribution in Lake Ossa and determining the most efficient manatee detection method, 24th Biennial Conference on the Biology of Marine Mammals

2022 Emily Garcia and **Athena Rycyk**, Characteristics of Wild Florida Manatee (*Trichechus manatus latirostris*) Vocalizations in Different Sized Groups, 24th Biennial Conference on the Biology of Marine Mammals

2022 Karianne Kapfer and **Athena Rycyk**, The Phenology of Humpback (*Megaptera novaeangliae*), Blue (*Balaenoptera musculus*), Fin (*Balaenoptera physalus*), Sperm (*Physeter macrocephalus*), and Killer Whales (*Orcinus orca*) Determined by Passive Acoustic Monitoring Near Barkley Canyon, 24th Biennial Conference on the Biology of Marine Mammals

2022 Marena Long and **Athena Rycyk**, Distribution of the Bigg's Killer Whale Ecotype in the Salish Sea with Regards to Seasonality and Pinniped Vulnerability, 24th Biennial Conference on the Biology of Marine Mammals

2022 Isabella McDonnell and **Athena Rycyk**, Growth patterns and the effect of acidification on postcranial vibrissae in Florida manatees (*Trichechus manatus latirostris*), Vocalizations, 24th Biennial Conference on the Biology of Marine Mammals

2022 *Longden, E.G., Gillespie, D., Mann, D.A., McHugh, K.A., **Rycyk, A.M.**, Wells, R.S., & Tyack, P.L. The anthropause in Sarasota Bay, Florida: a comparison of the marine soundscape before and during the COVID-19 lockdown, European Cetacean Society conference

2021 **Rycyk, Athena**, Bauer, Gordon, Wells, Randell, Gaspard, Joe, and Mann, David, Florida Manatee (*Trichechus manatus latirostris*) Hearing, Boat Noise, and Variations in Background Noise, presentation at the 4th Manatee Research Symposium (September 9, 2021)

2021 Bauer, Gordon, Reep, Roger, **Rycyk, Athena**, and Mann, David, Manatee Cognition and Conservation, presentation at the 4th Manatee Research Symposium (September 9, 2021)

2021 **Rycyk, Athena**, *Factheu, Clinton, Angel Ramos, Eric, Brady, Beth, Kikuchi, Mumi, Nations, Hannah, Kapfer, Karianne, Hampton, Cecilia, Garcia, Emily, & Takoukam Kamla, Aristide. Passive Acoustic Monitoring and Characterization of African Manatee Vocalizations. Oral presentation at the 1st African Manatee Symposium,

2020 *Factheu, Clinton, **Rycyk, Athena**, Angel Ramos, Eric, Brady, Beth, Kikuchi, Mumi, Nations, Hannah, Garcia, Emily, Hampton, Cecilia, Kapfer, Karianne, & Takoukam Kamla, Aristide. A novel approach to identifying the African manatee distribution using passive acoustics. Oral presentation at the 2nd African Bioacoustics Community Conference

2020 **Rycyk, Athena**, *Factheu, Clinton, Angel Ramos, Eric, Brady, Beth, Kikuchi, Mumi, Nations, Hannah, Garcia, Emily, Hampton, Cecilia, Kapfer, Karianne, & Takoukam Kamla, Aristide. Preliminary findings: First characterization of African manatee (*Trichechus senegalensis*) vocalizations. Oral presentation at the Manatee Research Symposium

2020 **Rycyk, Athena M.**, Reep, Roger, Gaspard, Joe, Colbert-Luke, Debborah, Nowacek, Doug, Deutsch, Charles J., Mann, David, Wells, Randall, & Bauer, Gordon. Florida Manatee

(*Trichechus manatus latirostris*) Hearing and Boat Collisions: Integration of Laboratory and Field Studies. **Invited** presentation for Oregon State University's Hatfield Marine Science Center

2020 **Rycyk, Athena M.**, Reep, Roger, Gaspard, Joe, Colbert-Luke, Debborah, Nowacek, Doug, Deutsch, Charles J., Mann, David, Wells, Randall, & Bauer, Gordon. Florida Manatee (*Trichechus manatus latirostris*) Hearing and Boat Collisions: Integration of Laboratory and Field Studies. **Invited** presentation at the Clearwater Marine Aquarium Strandings Conference

2019 **Rycyk, Athena M.**, Deutsch, Charles, J., Barlas, Margaret E., Koslovsky, Stacie, Frisch, Katherine, Leone, Erin H. & Nowacek, Doug P. Florida manatee behavioral response to boats. Oral presentation at the World Marine Mammal Conference, Barcelona, Spain

2019 Wells, Randall, McHugh, Katherine, Berens McCabe, Elizabeth, Allen, Jason, Barleycorn, Aaron, McBride-Kebert, Shauna, Toms, Christina, Tyson Moore, Reny, Wilkinson, Krystan, Cush, Carolyn, Bassos-Hull, Kim, Lovewell, Gretchen, Rossman, Sam, Mann, David, Schwarz, Lisa, & **Rycyk, Athena M.** Bottlenose dolphins and red tide harmful algal blooms: Are patterns of dolphin responses emerging from repeated events? Oral presentation at the World Marine Mammal Conference, Barcelona, Spain

2019 **Rycyk, Athena M.**, Reep, Roger, Gaspard, Joe, Colbert-Luke, Debborah, Nowacek, Doug, Deutsch, Charles J., Mann, David, & Bauer, Gordon. Florida Manatee (*Trichechus manatus latirostris*) Hearing and Boat Collisions: Integration of Laboratory and Field Studies. Oral presentation at the Manatee Research Symposium, Gainesville, FL

2019 **Rycyk, Athena M.**, Skinner, Jessica, Ryba, Tyrone, & Erdsack, Nicola. Florida Manatee (*Trichechus manatus latirostris*) Algae Cover. Oral presentation at the Manatee Research Symposium, Gainesville, FL

2018 **Rycyk, Athena M.**, Deutsch, Charles, J., Barlas, Margaret E., Koslovsky, Stacie, Frisch, Katherine, Leone, Erin H. & Nowacek, Doug P. Florida manatee behavioral response to boats. Oral presentation at the Manatee Research Symposium, Gainesville, FL

2018 **Rycyk, Athena M.**, Bauer, G., Reep, R., and Mann, D. Florida Manatee Hearing and Boat Collisions: Integration of Laboratory and Field Studies. Oral Presentation at International Society for Comparative Psychology, Los Angeles, CA (presented by Bauer)

2014 **Rycyk, Athena M.** Response of manatees to boat traffic: behavior and the acoustic environment. **Invited** talk, Eckerd College Program Series

2013 **Rycyk, Athena M.** Florida manatee response to vessels. **Invited** talk, Texas A&M, Corpus Christi

2012 **Rycyk, Athena M.**, Deutsch, Charles, J., Barlas, Margaret E., Koslovsky, Stacie, Frisch, Katherine & Nowacek, Doug P. Florida manatee response to vessels. **Invited** talk at the Florida Marine Mammal Health Conference, Sarasota, FL

2011 **Rycyk, Athena M.**, Deutsch, Charles, J., Barlas, Margaret E., Koslovsky, Stacie, Frisch, Katherine & Nowacek, Doug P. Florida manatee response to vessels: Integration of Geo-spatial, behavioral, and multi-sensor tag data. Oral presentation at the 19th Biennial Conference on the Biology of Marine Mammals, Tampa, FL

2011 Koslovsky, S. M, Deutsch, C. J., Barlas, M. E., Reynolds, B. J., **Rycyk, A. M.**, Nowacek, D. P., and Fagan, D. E. Manatee habitat use in relation to bathymetry in southwest Florida

(2007-2008). Oral presentation at the 19th Biennial Conference on the Biology of Marine Mammals, Tampa, FL

2009 **Rycyk, Athena M.**, Deutsch, Charles, J., Barlas, Margaret E., Nowacek, Doug P., Koslovsky, Stacie, & Frisch, Katherine Florida manatee behavior during vessel approaches. Poster at the 18th Biennial Conference on the Biology of Marine Mammals, Québec City, Canada

2009 Deutsch, C.J., **A. Rycyk**, M.E. Barlas, D.P. Nowacek, S.M. Koslovsky, and K. Frisch. Boat traffic from the manatee perspective: Spatial and temporal patterns of tagged manatee interactions with motorized watercraft in southwest Florida. Poster presentation at the 18th Biennial Conference on the Biology of Marine Mammals Conference, Québec City, Canada

2008 **Rycyk, Athena M.**, Nowacek, Doug P., Deutsch, Charles, J., & Barlas, Margaret E. Vocal behavior of Florida manatees during vessel approaches. Oral presentation at the 156th Meeting of the Acoustical Society of America, Miami, FL

2007 **Rycyk, Athena M.** & Nowacek, Doug P. Acoustic Environments of Bottlenose Dolphins (*Tursiops truncatus*) in the Big Bend Region of Florida. Oral presentation at the 154th Meeting of the Acoustical Society of America, New Orleans, LA

2005 **Rycyk, Athena M.** & Nowacek, Doug P. Acoustic behavior of Bottlenose Dolphins (*Tursiops truncatus*) in the Big Bend region of Florida. Poster at the 16th Biennial Conference on the Biology of Marine Mammals, San Diego, CA

2003 **Rycyk, Athena M.** & Bauer, Gordon B. Manatee Psychophysical Testing: Are Results Biased by Sequence Learning? Poster at the 15th Biennial Conference on the Biology of Marine Mammals, Greensboro, NC

RESEARCH PERMITS

Current Co-investigator on U.S. Fish and Wildlife Service permit for select research activities with wild and captive Florida manatees, Permit # MA100361-4

Current Co-investigator on National Oceanic and Atmospheric Administration permit for research activities with bottlenose dolphins, Permit # 26622

Current Special Activity License: Aquatic Species Collecting Certificate

2019–2020 Distribution of North American River Otter in Myakka River State Park, permit # 10281914

IACUC CURRENTLY APPROVED STUDIES

Current Manatee Sensory Processes and Cognition, protocol #23-03-PC2 (Mote Marine Laboratory IACUC)

Current Passive Acoustic Recording of Florida and African Manatees, protocol # S00007646 (USF IACUC)

Current Marine Diversity Sampling, protocol # IS00011634 (USF IACUC)

Current Observations of Social Behavior in Crocodilians, protocol # IS00008691 (USF IACUC)

COMPLETED STUDENT UNDERGRADUATE THESIS PROJECTS SPONSORED

2023 Crocodile talk: Structural analysis of American and Morelet's crocodile vocalizations in Belize, Helena Wood-Barron

2023 Identifying biomarkers of brevetoxin exposure in the Northern quahog metabolome with ^{1}H NMR spectroscopy, David Ponce

2023 Common karp and koi coloration from cultural and scientific perspectives, Alana Swartz

2022 Underwater sound localization in Mississippi map turtles (*Graptemys pseudogeographica kohnii*), Hannah Olson

2022 How effective are flowerpot snakes when it comes to controlling termite pest populations?, Skylar Gross

2021 Sleeping with the (cuttle)fishes: measuring sleep through arousal threshold in the dwarf cuttlefish, *Sepia bandensis*, Hannah Nations

2021 The phenology of humpback (*Megaptera novaeangliae*), blue (*Balaenoptera musculus*), fin (*Balaenoptera physalus*), sperm (*Physeter macrocephalus*), and killer whales (*Orcinus orca*) determined by passive acoustic monitoring near Barkley Canyon, Karianne Kapfer

2021 Growth patterns and the effect of pH on the Florida manatee (*Trichechus manatus latirostris*) vibrissae, Isabella McDonnell

2021 Distribution of the Bigg's killer whale ecotype in the Salish sea with regards to seasonality and pinniped vulnerability, Marena Long

2021 Characteristics of wild Florida manatee (*Trichechus manatus latirostris*) vocalizations in different sized groups, Emily Garcia

2021 Directional discrimination of goldfish conditioned under pure blue to pure green light spectrum, Chenoah DuBree

2020 The underwater vocal repertoire of the North American river otter, Victoria Dina

PROFESSIONAL SOCIETY MEMBERSHIP

Society for Marine Mammalogy
Acoustical Society of America
Animal Behavior Society
Florida Marine Science Educators Association

PEER REVIEW SERVICE

Marine Mammal Science, Journal of Wildlife Management, Wildlife Monographs, Acoustical Society of America, Behaviour, Journal of Ethology, Journal of Zoological and Botanical Gardens, and Frontiers in Marine Science in their Marine Conservation and Sustainability section

SERVICE

Educational Policy Committee, Quality Enhancement Plan committee, Environmental Studies Steering committee, FTIC (first time in college) Summer Advising, Outreach to prospective and accepted students for Biology and Marine Biology, service related to the following AOCs (majors): Animal Wellbeing and Conservation, Biology, Biopsychology, and Marine Biology, member of the scientific committee for the 3rd African Bioacoustics Community Conference, board member of the Sarasota Bay Listening Network

Amber Gabrielle Whittle, Ph.D., PWS (lapsed)

C: 941-586-2612 | ambergabrielle@msn.com

EXECUTIVE DIRECTOR

Lead by example and build consensus and partnerships among diverse stakeholders to achieve goals; exceptional communication and interpersonal skills; well-versed at incorporating science, research, and conservation into management objectives; successful grant and private fundraiser; a detail-oriented yet visionary, strategic, and goal-driven program and staff manager providing clear accountability, transparency, and relationship-building; consistently delivers projects on time and on budget; strong policy, permitting, and natural resource management skills.

Expertise

Strategic Vision & Execution|Relationship-Building|Development & Grant Writing|Team Motivation & Leadership|Board Relations|Science-Based Conservation |Project & Program Management |Environmental Permitting |Media Engagement | Political Engagement |Fiscal Accountability|Stakeholder Engagement & Partnership

Multi-Stakeholder Coordination Experience

GOMA|TBEP|FWRMC|SAFMC|SBEP|NRDA TWG & EPT |FWLI |GSAA|GCERTF|USCRTF|SFERTF|FCMP|SeaGrant

WORK EXPERIENCE

Southface Sarasota at the Florida House, Sarasota, FL March 2021-present

Executive Director/VP of Development & Marketing and Communications for Southface

Responsible for strategic vision & planning & execution, development, board relations, political relations, media relations, operations, supervision, and communications for a resilience program focused on energy efficiency, watershed restoration, climate change, and social equity and health. Raised in excess of $2M for Sarasota location with major donors, foundations, corporations, and individuals. Lead the Southface, a $8.7M company, Development department focusing on unrestricted funds and the MarComm department focusing on marketing, website, social media, press, campaigns, events, professional, and program materials.

New College of Florida, Sarasota, FL June 2022-present

Director of the Pritzker Marine Biology Research Center and Research Scholar

Perform administrative oversight of an active research and teaching facility, including staff supervision, budget, faculty and student research and teaching resource allocation, partner engagement, facility functionality, $4M grant funding for research and facilities, tours, and outreach.

The Florida Aquarium, Center for Conservation, Apollo Beach, FL April 2019-March 2021

Director of Conservation/Director of Grants & Foundations

Visioned, funded, supervised and guided conservation priorities and communication, including coral larval propagation and sea turtle research. Integrated multi-level, multi-partner conservation practices throughout the Aquarium and its species. Met with legislative leaders to guide conservation policy. Led research, in both the field and the lab, to improve conservation practices and to inform restoration actions. Annually oversaw >$1.1M budget and a growing satellite campus focused on conservation. Led grant & foundation funding acquisition; raised $4.6M. Communicated mission and science to public through media, scientific presentations, & video.

Fish and Wildlife Research Institute, St. Petersburg, FL June 2010-April 2019

Habitat Research Administrator

Supervised and guided research priorities and products for ~55 researchers and administrative personnel in the Coral, Seagrass, Upland, Coastal Wetlands, and Freshwater Plants groups. Annually, oversaw >$3.2 million in grants and managed >$1M in State Trust Fund budgets, which consistently had <2% reversion. Fostered collaborative relationships with internal and external partners, including local, state, federal, private, NGO, and public stakeholders. Ensured data is high quality and available to the public and scientific papers, products, and professional talks are generated. Identified research needs and funding to address strategic management questions/issues. Served on the Institute Leadership Team to create, direct, and manage the research priorities of the Florida Fish and Wildlife

Conservation Commission (FWC). FWC and federal agencies utilized my group's research and monitoring to adaptively manage the living resources in our State and waters.

- Served as the FL representative to the Gulf Coast Ecosystem Restoration Task Force (GCERTF) Science Coordination Team (SCT).
  - Co-led the Inland Habitats, Watersheds, and Offshore Waters for the SCT consisting of over 20 scientists from 12 different federal and state agencies. Author of the "Inland Habitats, Watershed and Offshore Waters" chapter of the GCERTF *Gulf of Mexico Science Assessment and Recommendations document* (2011).
  - Participated as a Florida team member to advocate for our priorities, verbally and in writing.
- Served on the NRDA Restoration Planning Team as an Executive Planning Team (EPT) member, as Habitat for Estuarine Dependent Water Column team member, and on the (RESTORE) Council Monitoring and Assessment Working Group (CMAWG) as the State of Florida alternate.
- Served on Standing Team Member for the Florida Wildlife Legacy Initiative (FWLI).
  - Serve as the liaison for the Habitat Monitoring/Coral Restoration/Marine teams.
  - Targets and approves ~$3M in FWS flow-thru grant funding annually.
- Served as the FL liaison: Healthy Ecosystems for the Governors' South Atlantic Alliance (GSAA), Habitat and Environment Advisory Panel for the South Atlantic Fisheries Management Council (SAFMC), and Wildlife and Fisheries for the Gulf of Mexico Alliance (GOMA).
  - Core team member to initiate, facilitate (3-part workshop), and draft the Gulf Monitoring Network proposal.
  - Rank funding proposals for GOMA's Gulf Star Program
- Coastal Monitoring team lead for the Florida Water Resources Monitoring Council (FWRMC).
  - Co-developing a multi-agency, multi-discipline Adverse Events Response Plan.
  - Authored and championed a Legislative Budget Request for Adverse Events Response.
- Grants committee membership: SWG, MEHRMA, FWRI, GOMA, NOAA RESTORE Science
- Florida Coral Disease Advisory Committee Coordinator, Steering Committee for the Florida Coastal Mapping Program (FCMP), and FWC Climate Change Steering Committee

Cardno, Inc., Sarasota, FL March 2004-June 2010

Senior Ecologist/Dive Safety Officer

Worked as an Environmental Consultant to plan, coordinate, and manage small- and largescale projects for public and private sector clients, including scheduling, training, and supervising large field and writing teams. Marketed ENTRIX's environmental consulting services at meetings and conferences, secured clients and projects, managed client expectations, participated in a multi-discipline (planners, engineers, environmental) project teams, and obtained environmental permits from local, state, and federal agencies. Consistently produced quality products on time and under budget. Managed watershed master planning projects including, Dona Bay Watershed in Sarasota, FL, Horsepen Strand in Collier County, and the Gordon River in Collier County. Delineated wetlands and native habitats, performed listed species surveys, produced and managed budgets, wrote in excess of 100 extensive responses to Requests for Proposals for private and government contracts, marketed potential clients and partners, and supervised environmental scientists.

EARLY CAREER EXPERIENCES

Teaching Assistant, UNIVERSITY OF HAWAII AT MANOA 2000-2003
Research Assistant, UNIVERSITY OF HAWAII AT MANOA 1998-2003
Vertebrate Ecology Intern, TALL TIMBERS RESEARCH STATION, Tallahassee, FL FALL 1997
Natural Resource Management Intern, SARASOTA COUNTY, Sarasota, FL SUMMER 1997
Assistant to the Public Lands Program, THE NATURE CONSERVANCY, Gainesville, FL 1997
Educational Intern, MOTE MARINE LABORATORY, Sarasota, FL SUMMER 1994

EDUCATION

PH.D., ZOOLOGY (ECOLOGY, EVOLUTION, & CONSERVATION BIOLOGY SPECIALIZATION)- UNIVERSITY of HAWAII at MANOA, Honolulu, FL

BS, Zoology - UNIVERSITY OF FLORIDA, Gainesville, FL
BA, English - UNIVERSITY OF FLORIDA, Gainesville, FL
Semester Abroad—James Cook University, Townsville, Australia
TRAINING: AAUS Diver, NAUI Master Diver, NAUI NITROX Diver, Professional Wetland Scientist (lapsed), Leadership Sarasota, 24-hour HAZWOPER, Dan O2, CPR, First Aid, Situational Leadership, Working with the Media, Supervisors Apprentice, FWC Climate Change Course, Certified Nonprofit Executive Director

PROFESSIONAL/VOLUNTEER EXPERIENCE, AWARDS

National Assoc. of Marine Labs, Treasurer/Secretary 2023
Science and Environment Council, Chair 2021-present
ACP Member Recognition 2021
Aquarium Conservation Partnership, Steering & Policy Committees 2019-2021
SeaGrant Advisory Committee, Manatee County 2019-2021
Sarasota County Coastal Advisory Committee, Chair 2018-present
Sarasota Bay Estuary Program Technical Advisory Committee, Chair 2004-present
Silent Auction Chair, FRUITVILLE ELEMENTARY PTO, Sarasota, FL 2011-2016
Vice President BoD, SISTERS OFFERING SUPPORT, Honolulu, HI 1998-2003
Outstanding Supervisor Nominee, FISH AND WILDLIFE RESEARCH INSTITUTE
In-Class Volunteer (4 hrs./mth), FRUITVILLE ELEMENTARY, Sarasota, FL
Science Fair Judge, FRUITVILLE ELEMENTARY, Sarasota, FL
Environment Day Co-Chair/Executive Committee, CHAMBER OF COMMERCE, Sarasota, FL
Community Service Co-Chair, YOUNG MOTHER'S LEAGUE, Sarasota, FL
Graduate Student Representative, UNIVERSITY OF HAWAII AT MANOA, HI
Key Club, UNIVERSITY OF FLORIDA, Gainesville, FL
Alternative Spring Break, Washington DC

SCIENTIFIC PUBLICATIONS

Lunz KS, Shea C, Ames KW, Neely K, Goergen E, Williams D, Gilliam DS, Whittle A (2016) *Acropora palmata's* last stand in Florida? *Proceedings of the 13th International Coral Reef Symposium*, Honolulu: 2-22.

Whittle, A. and Jones, M. 2008, The Dona Bay Watershed Restoration Plan. *Proceedings of the Ecosystems Restoration & Creation Conference.*

Lankford, S., Inui, Y. and Whittle, A, 2008. Exploring Social Carrying Capacity Based on Perceived Level of Crowding: A Case Study of Hanauma Bay, Hawaii. *Tourism in Marine Environments*. 5(1): 43-53(11).

Lankford, *et al.,* 2006. Sustainability of Coastal/Marine Recreation: Modeling Social Carrying Capacity for Kaneohe Bay, Hawaii. University of Hawaii Sea Grant Program. 77 pages.

Lankford, *et al.,* 2005. Sustainability of Coastal/Marine Recreation: Modeling Social Carrying Capacity for Hanauma Bay, Hawaii. University of Hawaii Sea Grant Program, 102 pages.

Whittle, A. 2004. Investigation of sound as a recruitment cue in larval fishes and *Schindleria* sp. Abstract in *Pacific Science.* 58(1):136.

Whittle, A. 2003. Abundance, distribution, diversity, and ecology of larval coral reef fishes and Schindleriidae (Teleostei: Gobiodei) at two sites on Oahu, Hawaii. Dissertation. University of Hawaii at Manoa.

Whittle, A. 2002. Nearshore currents in Hanauma Bay and their possible relationship to larval ecology. Abstract in *Pacific Science.* 56(1):99-100.

SCIENTIFIC PRESENTATIONS

Personal Pollution Energy Panel; EcoSummit, December 2023
Natural Resources; League of Women Voters, November 2023
Energy Efficiency; Sustainable Communities Workshop, November 2022
Resilience is Energy Efficient; New College Challenge, October 2022
Green Careers Panel; Environmental Design Conference, September 2022
Southface Sarasota at the Florida House: A Strong Partnership; Sarasota County School Board, April 2022
Demonstrating Water and Energy Conservation; Florida Outdoor Writers Conference, August 2021
Coral Restoration & Artificial Reefs; Artificial Reefs Summit, November 2020

SE FL Restoration Hub; SEFCRI Technical Advisory Committee, November 2020

Coral Breakthrough; Hope Spot Initiative w/ Sylvia Earle, October 2019

Coral Conservation at The Florida Aquarium; Florida Association of Environmental Professionals, Sept. 2019

Advancing Conservation with Zoos and Aquariums; Capitol Hill Ocean Week, June 2019

Hill Day Lunch Briefing for Congressional Staff; Capitol Hill Ocean Week, June 2019

Coral Outplant; Florida Aquarium Board of Directors, May 2019FWRI Coastal Mapping Priorities; Florida Coastal Mapping Program Workshop, January 2018

Habitat Research Section Overview; FWRI All Hands, November 2017

Overview of Florida's Marine Habitat Status and Trends; Florida Marine Science Symposium, October 2017

Florida's Monitoring Approach –*Integrated Mapping & Monitoring Programs and Metadata Catalogs;* Gulf of Mexico Alliance Wildlife and Fisheries Team, March 2017

Acropora Palmata's Last Stand in Florida?; International Coral Reef Symposium, June 2016

Coral Reef Monitoring and Management; Institute Leadership Team, September 2015

Ecological Monitoring in Florida; National Academy of Science, August 2015

Healthy Ecosystems Priorities; Governor's South Atlantic Alliance, September 2014.

Update on Gulf Coast Ecosystem Restoration Council Activities; American Water Resources Association, September 2014.

Coastal Monitoring Update; Florida Water Resources Monitoring Council, May 2014.

National Coastal Condition Assessment; Institute Leadership Team, April 2014.

Habitat Research; Administrative Assistants Meeting, September 2013.

ILT Science Meeting; Institute Leadership Retreat, January 2013.

FWRI Restoration Research; Charlotte Harbor National Estuary Program, October 2012.

Dry Tortugas National Park; Fruitville Elementary, October 2012.

GOMA Nuggets; Gulf Monitoring Network, September 2012.

Habitat Research; Institute Leadership Team, May 2012.

Breakout Discussion: Strategies for communicating science and scientific uncertainty to the public; Sarasota Bay Watershed Symposium, February 2012.

Coral Reef Fish Jenga; FWC Climate Change Course. October 2011.

FWRI Water Resources Monitoring Programs; Florida Water Resources Monitoring Council, July 2011.

Ocean Governance, an Overlap; Beyond the Horizon, Creating a Network of Special Ocean Places: Sarasota, FL. May 2011.

Summary of FWC's Role in the DWH Oil Spill Response; Sustainable Remediation Forum, February 2011.

Habitat Research; Institute Leadership Team, October 2010.

Horsepen Strand Conservation Area; UF Water Institute Symposium, February 2010.

Dona Bay Watershed Restoration Plan; American Water Resources Association, November 2008.

Dona Bay Watershed Restoration Plan; Benedict Symposium, Conservancy of Southwest Florida, December 2007.

Dona Bay Watershed Restoration Plan; Ecosystems Restoration & Creation Conference, November 2007.

Little fishes in the big pond: Abundance, distribution, and ecology of larval fishes and Schindleriidae; Ph.D. Dissertation Defense, October 2003.

Investigation of sound as a recruitment cue in larval fishes and *Schindleria* sp.; Albert L. Tester Memorial Symposium, April 2003.

How do the little fishes find a home?; Ecology, Evolution and Conservation Biology Evolunch, November 2002.

An ongoing light trap study of the larval ecology of Hanauma Bay including habitat selection, current effect, seasonal and lunar differences, *etc.;* American Fisheries Society Hawaii Chapter Symposium, November 2001.

Nearshore currents in Hanauma Bay and their possible relationship to larval ecology; Albert L. Tester Memorial Symposium, April 2001.

Do larval supply, larval recruitment, and adult population size in (four) reef fish species differ within and outside a Marine Life Conservation District on Oahu, Hawaii? (A study design); Hawaii Institute of Marine Biology Student Colloquium, November 1999.

The fall migration patterns of Purple Gallinules at the Tall Timbers Research Station; Tall Timbers Research Station. October 1997.

GRANTS FUNDED/MANAGED

Barancik Foundation and other funders $1.2M
Selby Foundation $17,484
Duckwall Foundation $5,000
Patterson Foundation $2,500
Giving Challenge $4,380
NOAA Community Restoration Grant $300,000

National Fish & Wildlife Foundation $448,800

National Fish & Wildlife Foundation $168,900

Department of Environmental Protection $34,200; $15,000

Zoo-Park Partnership $4,760

FWC Fish & Wildlife Research Institute $18,836; $34,491; $8,641

Tampa Bay Butterfly Conservancy $1,760

FWC State Wildlife Grant $61,500

GRANT AWARD COMMITTEES

Gulf of Mexico Alliance Gulf Star, Association of Zoos & Aquariums Conservation Grant Fund, FWC Marine & Estuarine Habitat Restoration, FWC Florida Wildlife Legacy Initiative, NOAA RESTORE Act, Coastal Advisory Committee

MEDIA

Iheart Radio| Associated Press International|Fox13 News|WFLA Live| Bay News 9| WUSF (Steve Newborn)| OnEarth.Org|4Hope|FaceBook Live|CNN |WSLR |Stream-Digital Podcast|Sarasota Herald Tribune|West Coast Woman|SNN|The Peel podcast|SCENE Magazine|Sarasota News Leader|Sarasota Magazine