

CHRISTIAN R. CAMPBELL

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EDUCATION

Duke University, Durham, NC

May 2024

B.S., Earth and Ocean Sciences (minor: Computer Science) **with Distinction** (GPA 3.2/4.0)

Thesis: Population genetic structure of three bottlenose dolphin (*Tursiops truncatus*) populations in the northwest Atlantic, advised by Thomas F. Schultz

Relevant Coursework: Marine Ecology, Sensory Biology, Comparative Physiology of Marine Animals, Atmosphere and Ocean Dynamics, Data Science, Discrete Math, Multivariable Calculus, Molecular Biology, Data Structures/Algorithms

RESEARCH EXPERIENCE

Duke University

Aug 2022 – May 2024

Advisor: Thomas F. Schultz

Durham, NC

Nucleotide diversity was calculated in three dolphin populations (inshore, coastal, offshore) in the northwest Atlantic to determine regions of increased selective pressure. We expected that selection around genes regulating hypoxia tolerance and deep diving capability would decrease as populations moved inshore. Using a high-resolution sliding window, we zoomed into 11 candidate genes. Expectedly, the ancestral population was most diverse and displayed spikes in diversity surrounding candidate genes. However, populations closer to shore displayed an independent accumulation of mutations at non-candidate genes, contributing to the growing body of research that inshore populations are diverging in response to unique environmental condition.

- Developed a pipeline to calculate nucleotide diversity in a 5kbp resolution window across the 2.3 billion bp dolphin genome. We visualized this data in a JBrowse genome browser to improve the process of finding regions of importance. Future lab members will be able to examine genetic data, overlay new data types, and easily share findings fully online with research communities.

University of Maryland, Eastern Shore REU

May 2023 – Aug 2023

Advisor: Chelsea Richardson, Paulinus Chigbu

Princess Anne, MD

This research tracked the feeding behavior of mesozooplankton in Sinepuxent Bay by measuring concentrations of fatty acid biomarkers derived from phytoplankton. The objective was to trace this energy to seven sources: brown algae, seagrasses, bacteria, diatoms, dinoflagellates, terrestrial plants, and red algae.

- Created an R script to automate matching fatty acid data to the appropriate source. We've shown that bacteria are a major dietary source for mesozooplankton, suggesting the microbial loop is an important source of production since bacterial communities tend to be moderated by tidally-dominated estuaries like our study site, Sinepuxent Bay.

WORK EXPERIENCE

Environmental Services Intern

July 2025 – March 2026

Nutria Eradication Program, California Department of Fish and Wildlife

Fairfield, CA

- Identified Nutria sign, deployed various traps, released non-target species, exterminated caught Nutria, and performed necropsies on a daily basis (Supervisor: Talmidge Robinson).
- Surveyed properties on Vansickle Island for suitable aquatic habitats by foot, kayak, and/or trail cam.
- Logged geographic extent, detection (camera and scat), and carcass data in ArcGIS, among other things.

Research Assistant

February 2022 – May 2024

Noor Lab, Duke University

Durham, NC

- Prepared fly culture media, cleaned and sterilized glass vials for reuse, and assisted with fly culture maintenance, and general lab tasks (PI: Mohammed Noor).
- Divided fruit flies by sex using CO2 plates and microscopes for future crossings.

eDNA Investigator

August 2022 – December 2022

Duke University Marine Lab

Beaufort, NC

- Filtered water from biofouled oyster bags for digests (Advisor: Daniel Rittschof).
- Extracted, labeled, and froze DNA from 8 phyla following a modified DNA Purification protocol.

FIELD EXPERIENCE

Volunteer

August 2022 – December 2022

Duke Aquafarm

Beaufort, NC

- Assisted Dr. Tom Schultz with deploying new oyster lines and maintaining current ones. Part of this involved consolidating oyster bags and removing unwanted biofouling and crustaceans.

R/V Shearwater Sampling trip (77' catamaran)

Beaufort, NC

- Embarked on a three-day overnight trip 45 nautical miles NE of Cape Hatteras surveying and photographing whales and dolphins.
- Assisted with basic deck operations including tying on/off the boat from the dock, lifting and transporting fenders to the storage room, and standing watch with crew members on shift.

R/V Kirby Smith (28' skiff)

Beaufort, NC

- Participated in day trips collecting blubber biopsies from bottlenose dolphins in inshore waters around Beaufort. Operated camera equipment and logged sighting/biopsy data into a Bento database.

SKILLS

Computational: R, UNIX, JS/jQuery, PHP, MySQL, Git/GitHub, BASH, QGIS, ArcGIS, Python, MS Suite, bioinformatic software (ANGSD, ngsLD, SAMtools, Jbrowse)

Laboratory: DNA extraction, species ID (mesozooplankton, biofouling, rodents), autoclave, necropsies, trailering, transporting live specimen, operating a UTV/ATV, coring, grab sampling, dichotomous keys, trawling, benthic sleds

REFERENCES

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