

Growing Research & Innovation at University of North Carolina Wilmington

Stuart Borrett

Associate Provost for Research & Innovation
Professor, Department of Biology and Marine Biology
University of North Carolina Wilmington



UNCW Overview

2018 Recognized as a Doctoral University; High Research Activity

18,031

STUDENTS

FALL 2021

24-28

ACT

FALL 2021

26-31

ACT HONORS

FALL 2021

71%

6-YEAR
GRADUATION
RATE

2015 COHORT UNCW

88%

6-YEAR
PERSISTENCE
RATE

2014 UNCW COHORT
ALL U.S. UNIVERSITIES

59

MAJORS

37

MASTER'S DEGREES

5

DOCTORAL DEGREES

1

1 OF 4 IN
UNC SYSTEM
2022 FISKE GUIDE
TO COLLEGES

5

AMONG PEERS,
STUDENTS
STUDYING
ABROAD
OPEN DOORS®

26

BEST ONLINE
BACHELOR'S
PROGRAMS
U.S. NEWS

96

TOP 100
BEST PUBLIC
NATIONAL
UNIVERSITY
U.S. NEWS



UNIVERSITY of NORTH CAROLINA WILMINGTON

Atlantic Ocean

University of North Carolina Wilmington

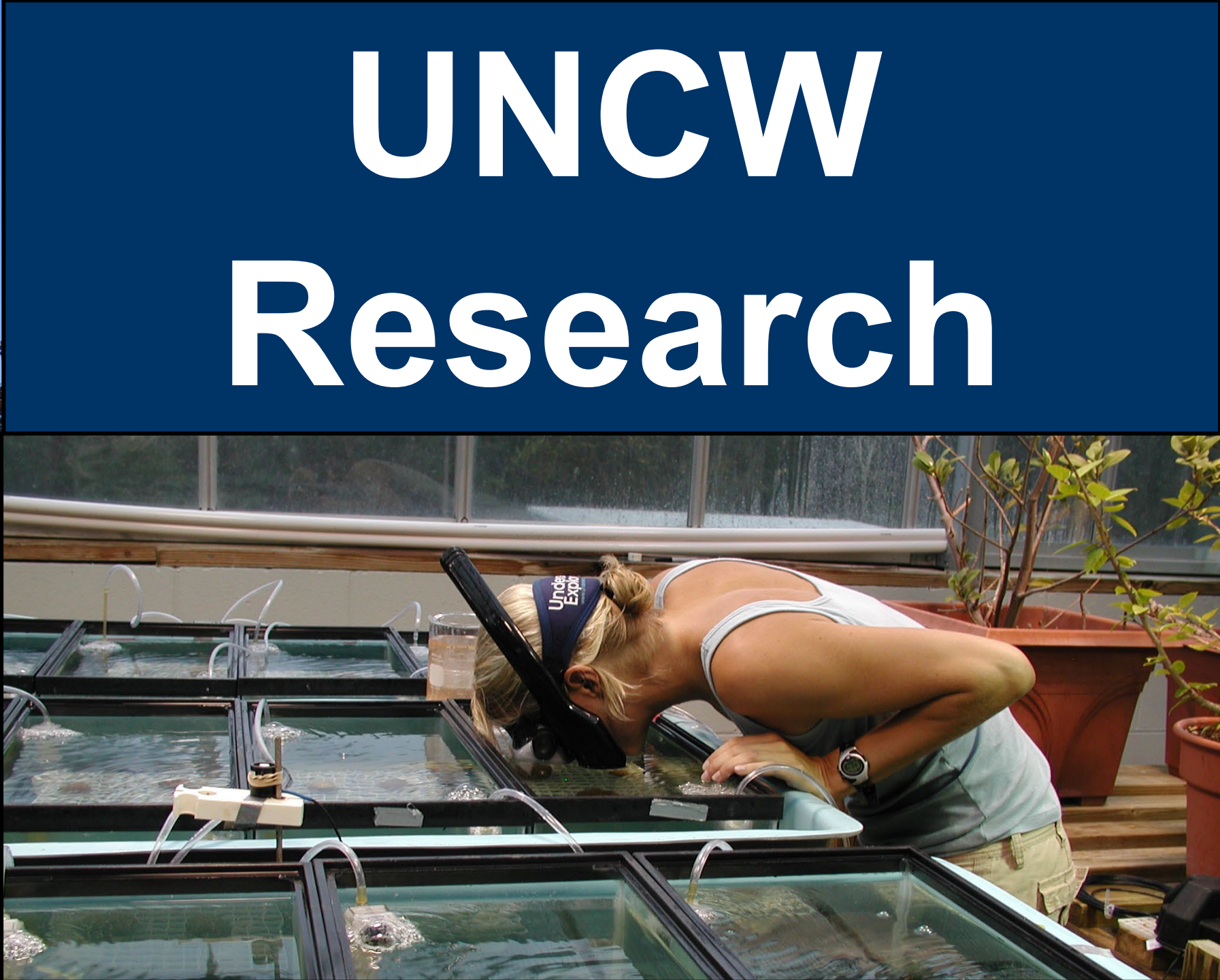


Intercoastal
Waterway

UNCW Myrtle Grove
Campus



UNCW Research



High Level View



Sponsored Programs

Awards: **\$13.7 M** (209)
Proposals: **\$87 M** (317)
R&D Expenditures: **\$16.5 M** (FY20)

Innovation & Commercialization

Disclosures: **6**
Licenses: **43**
Revenue (Licenses + Sales): **\$236,804**
Start-Ups: **0**
Patents Filed: **1**
Patents Issued: **0**
CIE Mentees: **149**
Leases (MARBIONC, CIE): **4, 18**

Core Research Competencies

- Coastal & Marine Science
- Health Care Innovation
- Blue Economy
- Computer & Information Sciences

Closer Look

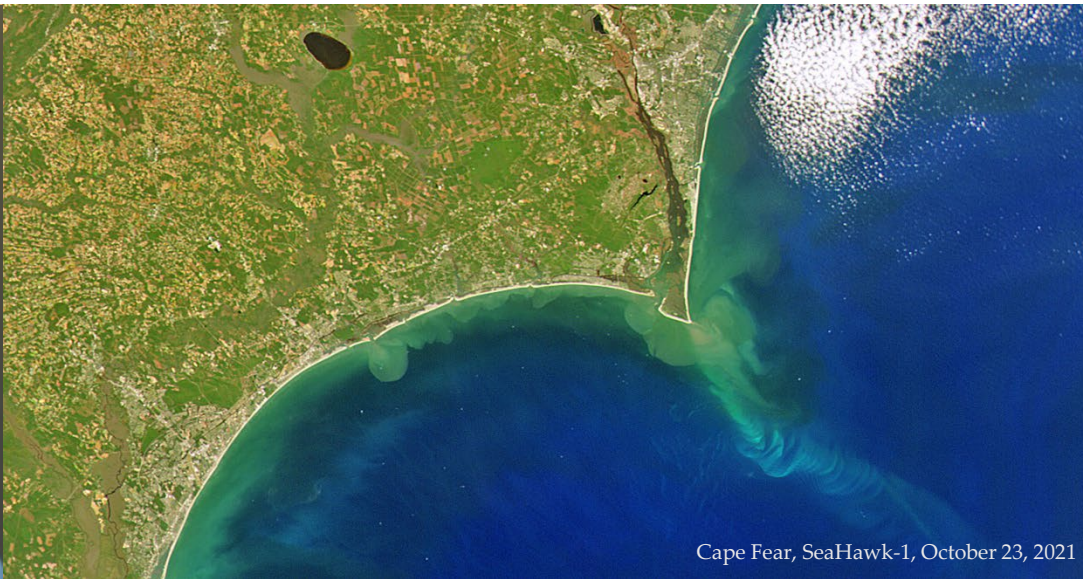


Buck Moth Family



Davis Borrett, Hanging Rock State Park, NC, Stuart Borrett, 2017

Examples of UNCW Research



Innovating the technology
for
coastal and ocean
observation

Growing Shellfish Industry



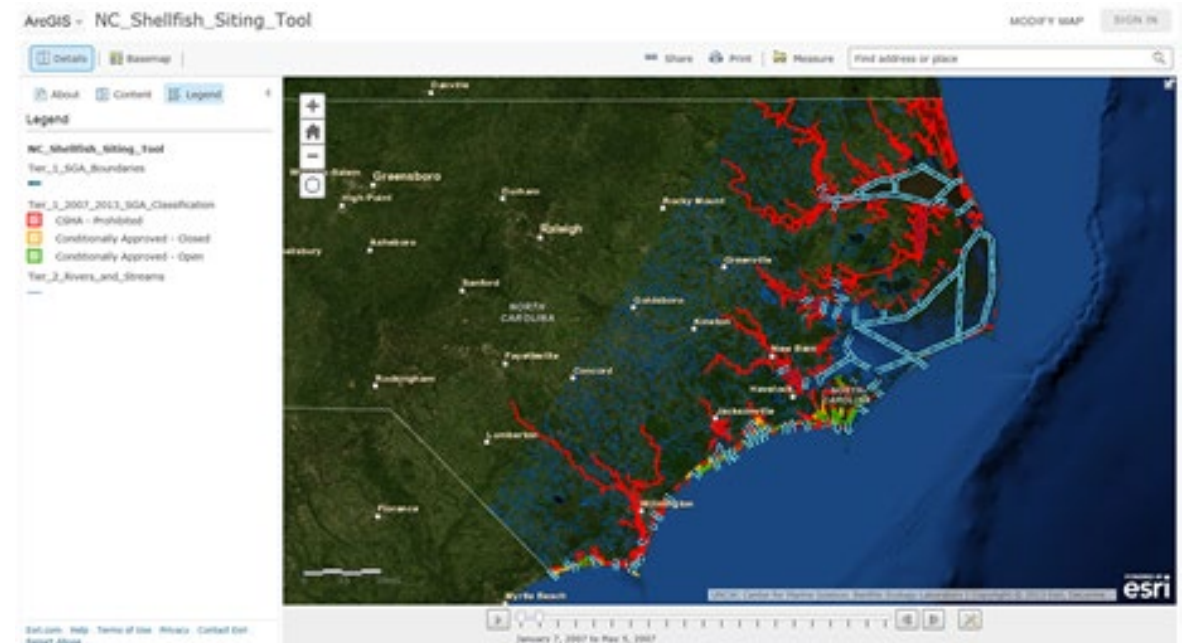
Research Shellfish Farm

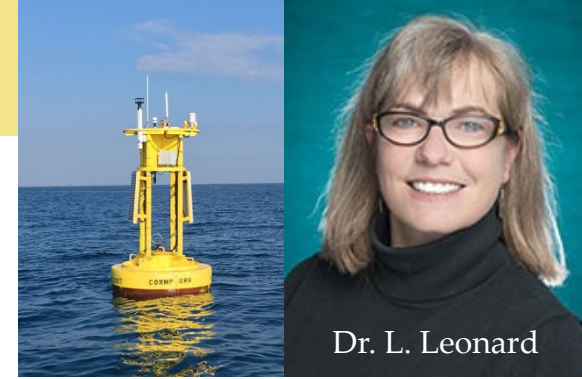


NC Shellfish Research Hatchery Current projects

- selective breeding of oysters
- performance advantages of triploidy
- crop diversification
 - culture practices for bay scallops, pen shells and sunray Venus clams.

NC Shellfish Siting Tool – Where to farm?





Dr. L. Leonard

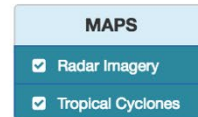
Data to ...

- Increase maritime safety
- Better forecasting of coastal hazards
- Support ecosystem based management
- Understand local coastal climate patterns
- Long-term data set



Home Data Educators About

UNC-W Coastal Ocean Research and Monitoring Program



CORMP STATIONS

- CAP2
- CMSDOCK
- FRP2
- ILM2
- ILM2WAVE
- ILM3
- LEJ3
- LEJ3WAVE
- SUN2
- SUN2CDIP
- SUN2WAVE

NDBC / US

- NDBC 4100
- NDBC 4101
- NDBC 4102
- USACE 411

CO-OP

National Weather Service Update

ing the next few days a powerful hurricane as the center moves near the US East Coast North Carolina.

Hurricane-force winds extend outward up to 60 miles (95 km) from the center and tropical-storm-force winds extend outward up to 195 miles (315 km). The Weatherflow station at Winyah Bay, South Carolina, recently reported sustained winds of 77 mph (124 km/h) and a wind gust of 85 mph (137 km/h). A buoy operated by the Coastal Ocean Research and Monitoring Program 15 miles northeast of the entrance to Charleston Harbor recently reported a wind gust of 92 mph (148 km/h).

The minimum central pressure based on Hurricane Hunter aircraft and buoy data is 958 mb (28.29 inches). NOAA buoy 41004 reported a minimum pressure of 959.4 mb (28.33 inches) as the eye passed over it.

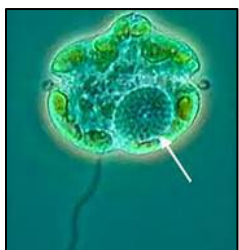
HAZARDS AFFECTING LAND

WIND: Hurricane conditions are now occurring along portions of the South Carolina coast northeast of Charleston and should continue for the next several hours. Tropical storm conditions are currently affecting other portions of the South Carolina coast.

Natural Product Chemistry & Human Health



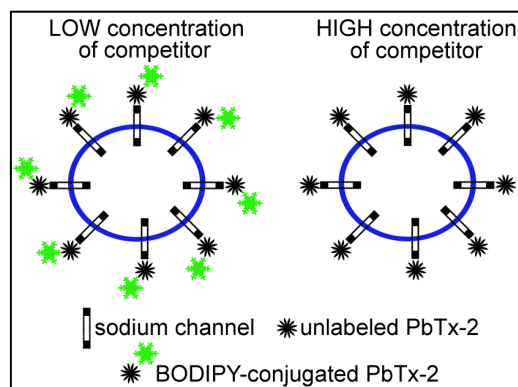
Asst Prof Clinical Research
(SON/CHHS)
CEO SeaTox Research
(UNCW spinout)



Marine algae
as sources of:

- Toxins
- Pharmacotherapeutics

Design bioassays (test kits)
to detect toxins in seafood



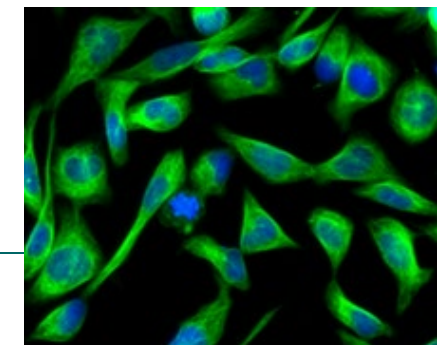
SeaTox Research, Inc.

- Collaborative grants with UNCW
- Kits sold by UNCW

Antibiotics and anti-fungal drugs

Immune modulators

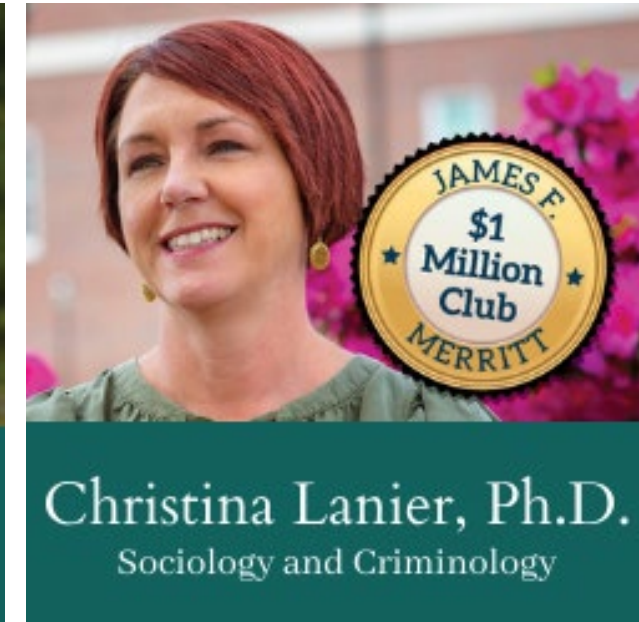
- Anti-inflammatory drugs
- Compounds to increase efficacy of anti-cancer treatments and vaccines



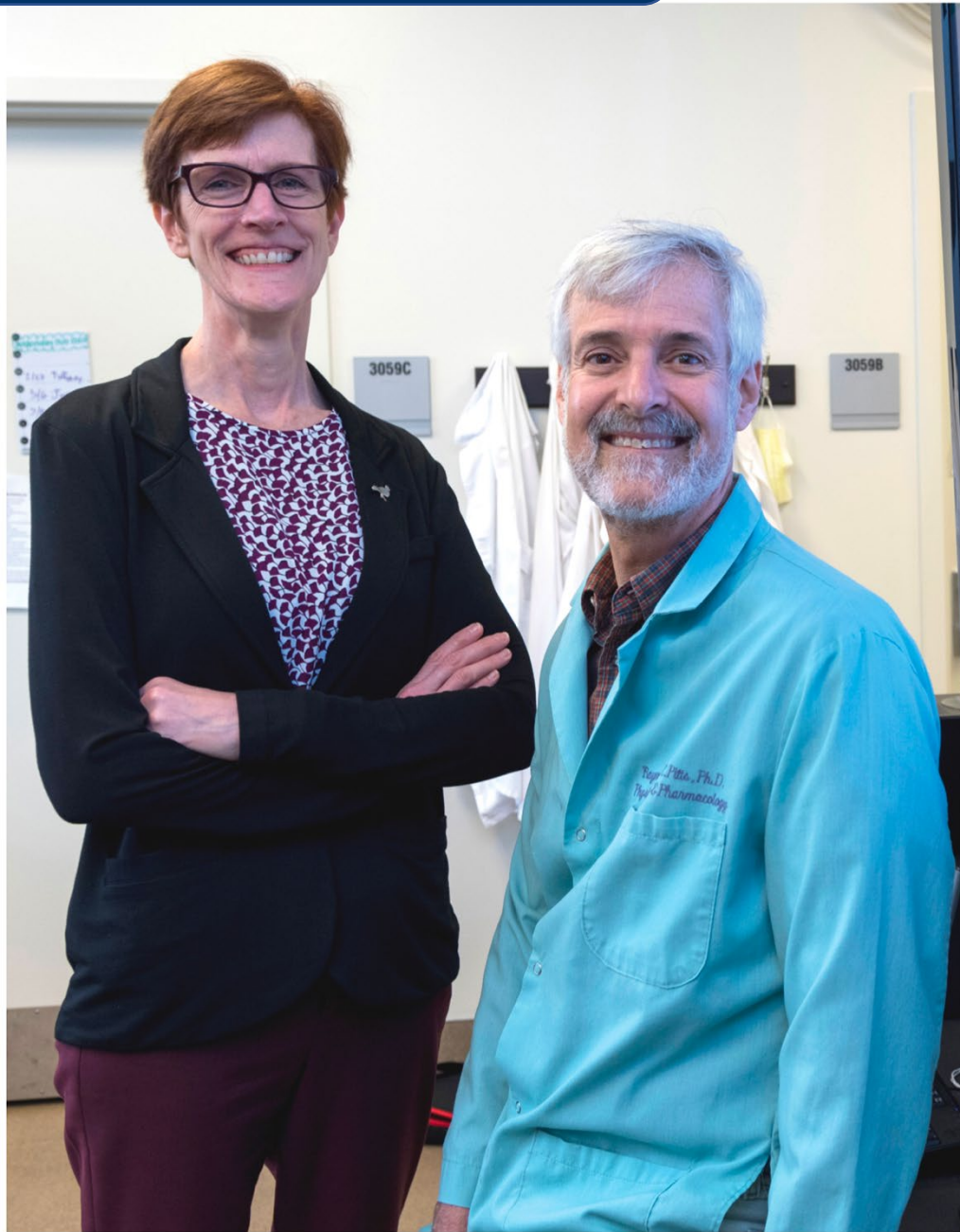
Dr. Christina Lanier and Dr. Kristen Devall

Dept. Sociology and Criminology
Co-Directors of the National Drug Court Resource Center

with Dr. Ron Vetter, Dr. Jeannie Pursuit,
and Dr. Sally MacKain



“NDCRC’s work influences the development, expansion and enhancement of **problem-solving court programs** across the country,” said DeVall. “It provides research support, legislative updates and training materials on emerging topics in the field.”



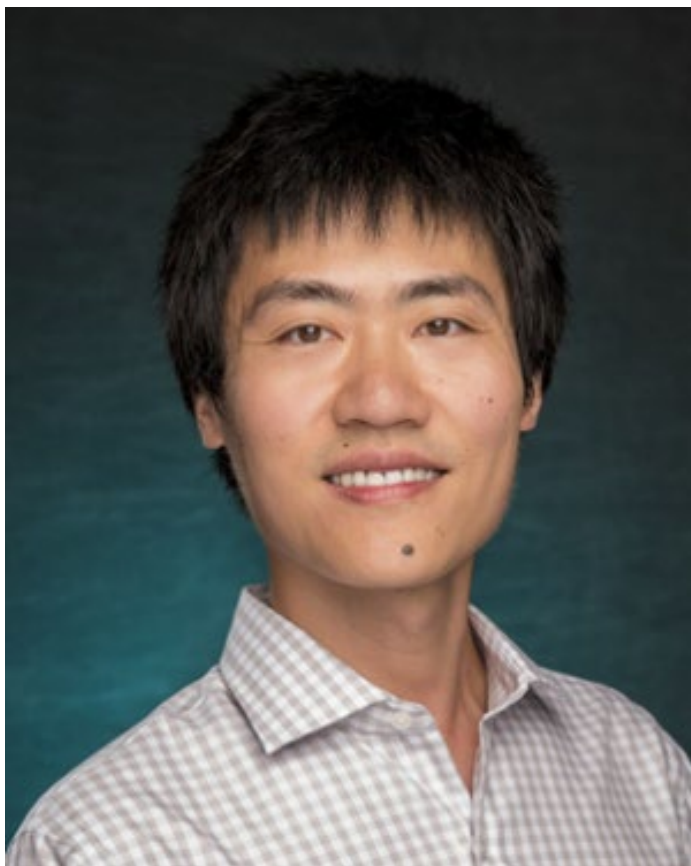
Dr. Raymond Pitts and Dr. Christine Hughes

Department of Psychology

Researching how acute and chronic exposure to the prescription opioid oxycodone affect specific reward processes involved in impulsive and risky behavior.



UNIVERSITY of NORTH CAROLINA WILMINGTON




Dr. Ying Wang
Asst Prof Chemistry &
Biochemistry

- Human disease
- Fundamental biology
- Biopharmaceuticals

Recent Funded Projects

A Study on Thermodynamics and Kinetics of Phase Transitions in mAbX Solutions
MedImmune, Inc. 

Application of PEG-induced Liquid-Liquid Phase Separation in Studying High
Concentration Protein Behavior
 **MERCK**

Development of A Microneedle Array Patch for Intradermal Delivery of mRNA
**North Carolina
Biotechnology Center.**



Measuring Neck Strength



Dr. Alex McDaniel
Asst Prof School of Health
and Applied Human
Sciences



Dr. Lindsey Schroder
Asst Prof School of Health
and Applied Human
Sciences

Novel device for isometric
neck strength assessment

Determine success of
strength and conditioning

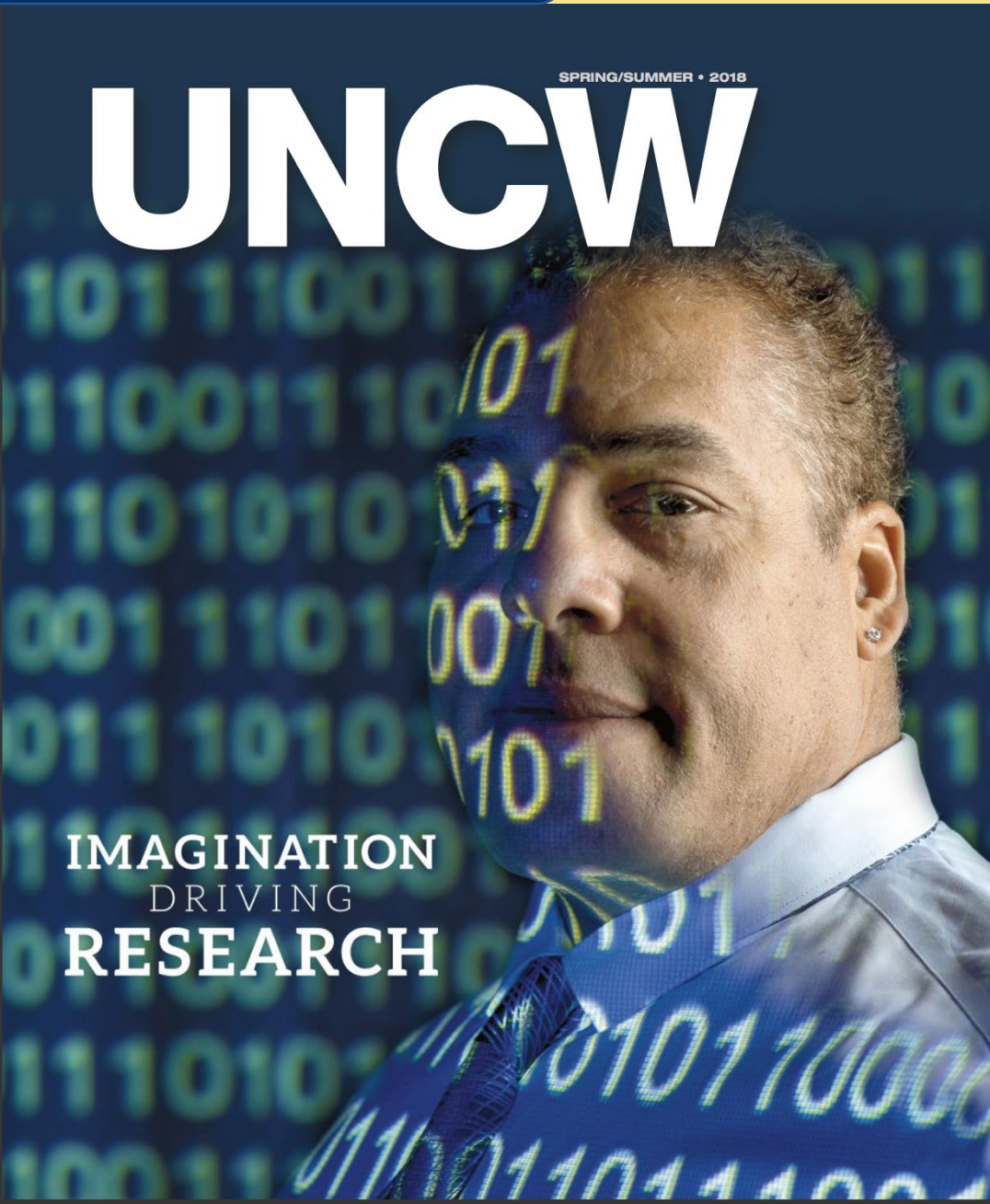
Prevent Traumatic
Brain Injury

Dr. Elham Ebrahimi

Virtual Reality



- Collaborated with NHRMC on a virtual reality experience designed to prepare children for surgery
- Created a virtual reality simulation for athletic trainers to enhance their skill in determining heat illness



Facing Aging Research

Assess and improve face-based biometric systems

Director of I3S



Lapetus Solutions, Inc.

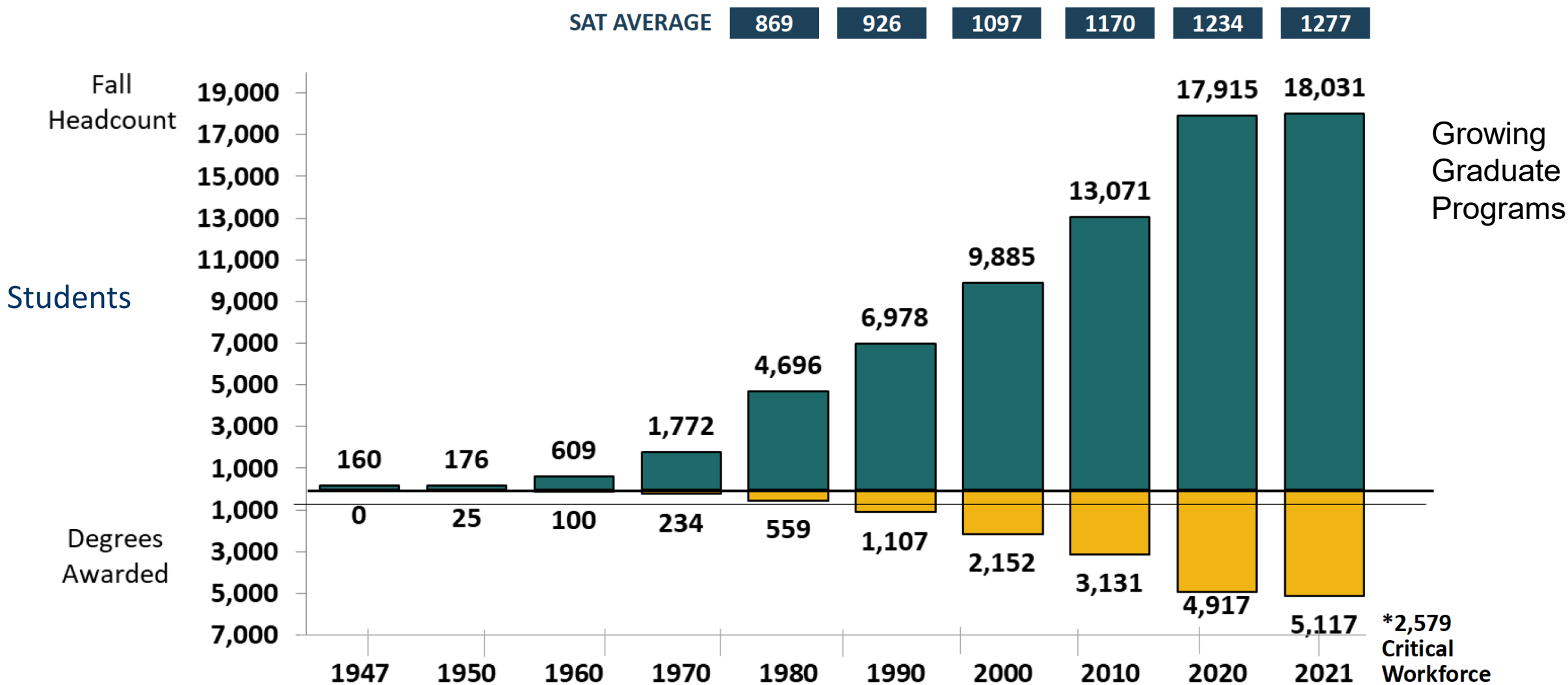


Led a team using tandem drones to map the advancement of an invasive marsh reed species in coastal North Carolina



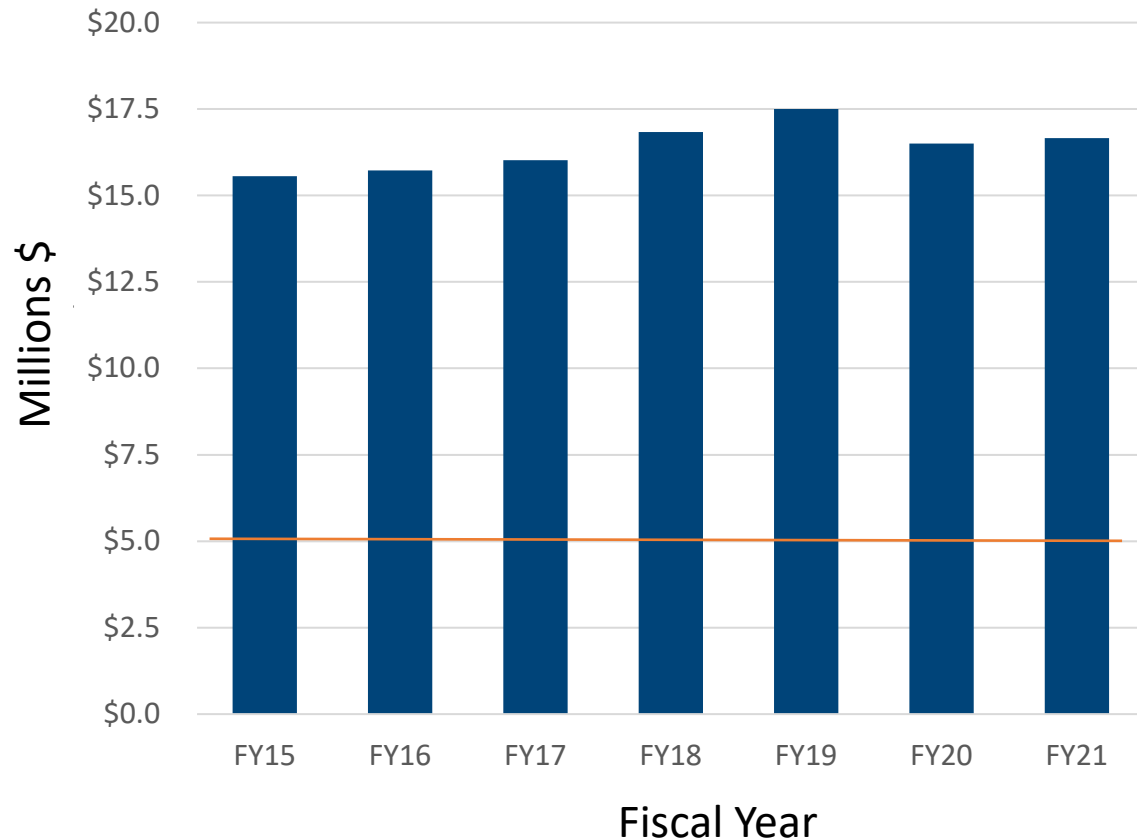
Piecing it Together

GROWTH WITH QUALITY



UNCW is a Research University

Research Expenditures



Doctoral Degree Programs

Current

**Integrative, Comparative, and Marine
Biology, PhD**
Psychology, PhD
Education Leadership, EdD
Doctor of Nursing Practice, DNP

New!

**Applied Coastal and
Ocean Sciences, PhD (Fall 2022)**
**Pharmaceutical
Chemistry, PhD (Fall 2023)**

Strategic Plan → Grow Research Impact

Key Points

UNCW is a growing research university

Core Research Competencies

- Coastal & Marine Sciences
- Health Care Innovation (e.g., human performance, drug discovery)
- Blue Economy
- Computer & Information Sciences (e.g., AI/ML, Cybersecurity, Geospatial)

Ready to partner for knowledge and solution discovery

