Why do Universities do Research?

Stuart Borrett
Interim Associate Provost for Research
Professor, Department of Biology and Marine Biology
University of North Carolina Wilmington
Cape Fear Rotary, March 8, 2019

Precipitating Events

Serve as Interim Associate Provost for Research
Responsible for the UNCW research enterprise
Challenged to grow research; Why?

Carnegie (CCIHE) reclassified UNCW as
Doctoral University with High Research Activity
Challenge to campus identity; transition.

Why do universities do research?
Definitions

Primary Research

Discovery of new Knowledge

Contrast with Scholarship & Creative Works

Brief History of the Research University

Earliest European Universities

University of Bolonga, 1008
University of Oxford, 1096
University of Paris, 1150

19th Century Germany

Wilhelm von Humboldt
Vision of the unity of teaching and research

American Universities (e.g., Harvard)
- initially blended German and English models
Continuous Construction

We are still building and reshaping universities

- Morrill Act of 1862 (created Land-Grant universities)
- Truman Commission, 1946 (universities to support democracy)
- Architecture of the National Science Foundation, 1950 (Vannevar Bush)
- Wisconsin Idea, 1971 ("university research should be applied to solve problems and improve health, quality of life, the environment, and agriculture for all citizens of the state")

Why Research at a University?

Knowledge for Knowledge’s Sake is a Good unto Itself

Contemplating, researching, testing, and writing about ideas requires strong habits of mind. These habits lead to great works.

“The best minds exercise regularly,” Dan Baden

New Knowledge is a Good unto Itself

“The creation of new knowledge is a service to society, and training others in the practice of curating and generating new knowledge is a core part of the academic mission”

Innovators of the Future Need our Knowledge

Portfolio strategy. Curiosity driven research can lead to unanticipated discoveries whose values is not known a priori.

The Work We Do Is Useful Now

Some research leads to commercial developments and intellectual property. Thus, university research can be an economic engine.

Solving problems (e.g., shoreline stabilization, weather prediction, medicine)
The purpose of the university is **knowledge**.

Knowledge **Production**  
(Research)

Knowledge **Transfer**  
(Education)

**Network Sources**  
key inputs

**Community Anchors**  
regional resilience & responsiveness

**Connecting Hubs**  
connect knowledge community and society

**Faculty Role**

Traditional, Tenure Track Faculty

- Teaching
- Research
- Service

**Service to University**  
(Shared Governance)

**Service to Academy**  
(Peer Review, Academic Societies)

**Service to Community**  
(Public Lectures, etc.)

**Different Kinds of Universities**

- Teaching
- Research

Shifting Responsibilities
Fueling Research: Sponsored Programs

<table>
<thead>
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<th>FY15</th>
<th>FY16</th>
<th>FY17</th>
<th>FY18</th>
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<td>Requested</td>
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<td>Research Expenditures</td>
<td>$15.56M</td>
<td>$15.72M</td>
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</table>

- Mean annual award total over last 5 years is $10 million (± $2 million SD)
- Approximately 63% of Sponsored Programs in last 5 years is for marine science.

Innovation, Commercialization, & Entrepreneurship

<table>
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<tr>
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<th>FY17+FY18</th>
<th>Current</th>
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<td><strong>Lessees at MARBIONC</strong></td>
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<td><strong>CIE Mentees</strong></td>
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</table>
Closer Look

Examples of UNCW Research

Dr. Karl Ricanek

Facing Aging Research
Assess and improve face-based biometric systems

Director of I3S

Lapetus Solutions, Inc.
Collaborated with the New Hanover County Department of Social Services to identify biomarkers of binge drinking in underage youth.

Dr. Kate Nooner
Psychology

Dr. John Morrison
Nanosatellite Marine Science from Space!

Physics and Physical Oceanography
Drs. Ann Pabst and Bill McLellan
Secrets of the Deepest Diving Whales: Acoustic Monitoring
Marine Mammal Stranding Network
$10 Million Dollar Club

Dr. John Lothes II
Assessments of PED101 students finds curriculum being used is enhancing overall student wellness
Dr. Elham Ebrahimi

Virtual Reality

• Collaborating with NHRMC on a virtual reality experience designed to prepare children for surgery
• Creating a virtual reality simulation for athletic trainers to enhance their skill in determining heat illness

Dr. Joseph Pawlik

Chemical Ecology; Marine Biology

Recently discovered that changes to coral reefs cause an invasion of sponges that are better adapted to reefs at a time of coral loss due to climate change
Dr. Bill Sterrett
Explained project-based-learning to middle school science teachers in Pakistan in key areas such as water and natural resource management

Dr. Scott Nooner
Placed instruments on the seafloor to measure colliding tectonic plates. Measurements help estimate hazards from large earthquakes
**Research in Response to Hurricane Florence**

National Science Foundation – RAPID Awards (Grants for Rapid Response Research)

**Mechanisms of Seagrass Community Injury and Resilience Post Hurricane Florence: Implications for Increasingly Stormy Coasts**

Jessie Jarvis and W Kenworthy  
$90,046

**Assessment of Coastal & Offshore Change Due to Hurricane Florence: Wrightsville Beach, NC**

Joni Backstrom  
$18,304

**The Response and Recovery of Adjacent natural and built coastlines impacted by Hurricane Florence**

Joseph Long, Devon Eulie, Eman Ghoneim, Andrea Hawkes, Lynn Leonard  
$48,543

**Evaluation of the Resilience of Shoreline Protection Methods to Hurricane Florence**

Devon Eulie and Huili Hao  
$43,317

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**Dr. Jennifer McCall**

Drug Discovery and Bioassay Development

- **Design bioassays (test kits) to detect toxins in seafood**

  ![Bioassay Test Kit Image]

- **SeaTox Research Inc**
  - Collaborative grants with UNCW (~$1.7M)
  - Kits sold by UNCW

- **Marine algae as sources of:**
  - Toxins
  - Pharmacotherapeutics

- **Antibiotics and anti-fungal drugs**

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

- **Asst Prof Clinical Research (SON/CHHS)**

- **CEO SeaTox Research (UNCW spinout)**
Piecing it Together

UNCW Enrollment Growth

GROWTH WITH QUALITY

SAT AVERAGE

869 926 1097 1170 1251*

Students

Fall

Headcount

Degrees Awarded

13% Graduate

*1251 new SAT; new target: 1310
Advance Research & Scholarly Activities

Stated Goal

Triple Sponsored Research Funding

$9.3 million → $30 million
FY 2018 FY 2021

Challenge to Dream Bigger!

Take Home Points

Carnegie has reclassified UNCW as a Doctoral University with High Research Activity (R2)

Research expenditures of $16.8 million
- Strength in Marine Science
- Diversity of research areas growing including Psychology, Computer Science, Human Health, and Education
- Solving Problems

Graduating 20+ doctoral students per year
- Education Leadership, Marine Biology, Psychology (starting)

Why Universities do Research
- Building the knowledge base, inventing the future, economic engine

Education is improved by coupling it to research activities