The Integrated Coastal Sciences PhD Program at ECU

coastal.ecu.edu/coastalstudies/integrated-coastal-sciences/

Presented to the CSI Board of Directors

November 12, 2021

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History and Background

• ECU’s flagship interdisciplinary PhD program (Coastal Resources Management PhD), began in 1999

• Standing stock of ~20-25 full-time students annually

• ~ 40 core faculty from Anthropology, Biology, Engineering, Geology, Geography, Maritime Studies, Recreation Sciences, Sociology

• Underwent a name change in 2018 (Integrated Coastal Sciences PhD) and transition into Department of Coastal Studies, Integrated Coastal Programs
Integrated Coastal Sciences PhD Curriculum

Coastal Natural Sciences & Engineering

Ecology
Geosciences
Engineering

Integration

Coastal Health & Social Sciences

Economics
Human Dimensions
Health
Shoreline Erosion Control

Approach #1

Approach #2

???

$
Pillars of a Successful PhD Program

- Faculty Mentorship
- Student Scholarship & Achievement
- Rigor
- Diversity
- Assessment
Faculty Mentorship
Student Scholarship and Achievement

• Numerous regional and national recognition including
  Knauss Fellowship
  Science Ambassador Scholarship
  Coastal Zone Outstanding Presentation Award

• Highly Active in publishing, presenting and engagement activities

soundrivers.org
Integrated Coastal Sciences PhD Curriculum Map

Coastal Natural Sciences
- ECOL (BIOL 7005 - 4 CR)
- GEO (GEOL 7002/7003 - 4 CR)

Coastal Health & Social Sciences
- HEALTH (EHST - 3 CR)
- ECON (ECON 7010 - 3 CR)
- HUMAN DIMENSIONS (ICS 7005 - 3 CR)

Integrative Courses
- Integrative Courses (ICS 8000 & ICS 8001 - 6 CR)

Ethics
- Ethics (####-7004 -2 CR)

Primary Concentration
- Minimum 12 CR

Research Methods
- Minimum 6 CR

Secondary Concentration
- Minimum 6 CR

Core competency examination

Dissertation proposal defense: Admission to candidacy

Dissertation (MINIMUM 24 CR)

Dissertation defense

68 Credits
Assessment (Proposal/Dissertation Writing)

### Evaluation of Dissertation and Dissertation Proposals

**Student Name:**

**Dissertation Title:**

Is the dissertation or the dissertation proposal acceptable:

- [ ] As submitted (150 points)
- [ ] After minor typographical and stylistic corrections (90 points)
- [ ] After minor substantive changes (60 points)
- [ ] After substantial revisions (70 points)
- [ ] Not acceptable (60 points)

Please qualify the rating above by providing written specific scores under each category in the fields below:

1) **Original Coastal Research** - Is the student's dissertation research innovative and timely? If not, please specify how the dissertation or proposed research could demonstrate more innovation and timeliness?

   ______ out of 20  

   Comments:

2) **Thematic Knowledge** - Has the student demonstrated an adequate basic knowledge of coastal natural and social sciences? If not, please specify knowledge that the student is lacking in areas of coastal natural or social sciences.

   ______ out of 20  

   Comments:

3) **Interdisciplinary Knowledge** - Does the dissertation address interdisciplinary thinking bridging natural and social sciences across a coastal or marine resource? If not, please specify how the student could improve the interdisciplinary nature of their research.

   ______ out of 20  

   Comments:

4) **Quantitative Skills Mastery** - Has the student conducted research that demonstrates knowledge and mastery of quantitative skills appropriate for their KCS/MRM concentration area (e.g., GEO, BIO, ECON, Human Dimensions)? If not, please specify how the person could improve their quantitative skills.

   ______ out of 20  

   Comments:

5) **Quality of Writing** - Is the writing lucid and well-organized? If not, please specify how the person can improve their writing.

   ______ out of 20
Assessment (Proposal/Defense Oral Presentation)

Duration of speech: ________________

Overall grade / score: _______ / 100 possible

Place points earned under each category (i.e., 1 – V). Place a + or –, and provide comments in each subcategory based on the student’s performance.

I. Organization (25 points possible)  Points given: _______

1. Clear and compelling attention-getter used: _______
2. Thesis statement clear: _______
3. Shows audience relevance of topic: _______
4. Clearly states credibility: _______
5. Preview statement clearly sets up speech body effectively: _______
6. Pattern of organization is distinct and easily recognizable: _______
7. Pattern of organization is appropriate to topic, purpose, occasion & audience: _______
8. Uses strong transitions, internal previews & internal summaries: _______
9. Restates main points in conclusion: _______
10. Closes with impact: _______

Comments:

II. Content (25 points possible)  Points given: _______

1. Main points clearly identified: _______
2. Main points show only one idea: _______
3. Main points are balanced: _______
4. Uses correct number of sources: _______
5. Cites sources throughout speech: _______

III. Delivery (30 points possible)  Points given: _______

1. Engaging eye contact: _______
2. Clear articulation and correct pronunciation: _______
3. No “uh,” “um,” “uh-huh,” or other vocal interrupters: _______
4. Uses vocal variety and intensity: _______
5. Uses appropriate and culturally sensitive language: _______
6. No profanity or other offensive language used: _______
7. Uses appropriate facial expressions: _______
8. Uses written prompts (on-screen text, note cards, etc.) in extemporaneous style: _______
9. Uses the pause effectively: _______
10. Rate is appropriately monitored: _______

Comments:

IV. Visual aids (10 points possible)  Points given: _______

1. Visual aid design: _______
2. Visual aid use during speech: _______

Comments:

V. Outline (10 points possible)  Points given: _______

1. Outline shown in oral presentation: _______
2. Annotations added as needed: _______
3. Source information for research: _______
4. Source material credit given: _______
5. Source material credit not given: _______
Rigor

Case study: Along Hatteras Island lies one of North Carolina’s most vulnerable roads, Highway 12, which has connected generations of communities on the Outer Banks to the mainland, is exposed to natural barrier island processes such as overwash and inlet formation during hurricanes. Inlets support marsh establishment and fisheries, and provide flood protection by allowing water from terrestrial floods to drain to the Atlantic Ocean. However, taxpayers have spent over $30 million since the 1990’s repairing damage to NC 12 and slowing natural inlet formation, in order to preserve access and local livelihoods. As sea level continues to rise along the NC coast, inlet formation on Hatteras Island will become more commonplace.

Develop a framework that a) presents the economic, ecological, social and geologic dimensions of this issue, and b) propose an integrated research question that would allow you to evaluate the economic, social, and environmental tradeoffs associated with maintaining NC 12 in the 21st century. Please consider the following in your answer:

1. Expand on the description above by describing the background/broader context of continuing to rebuild NC 12, drawing on material from the four core courses. To receive full credit, you must give equal treatment to each disciplinary perspective.
2. Describe how each of the components interact and how a change to one part of the system may impact other components or overall system functioning; you may include a causal loop diagram, systems map, stocks-and-flows diagram, etc. that shows positive and negative feedbacks within the system.
3. Outline a research approach for understanding feedbacks within this system that includes:
   a. An integrated research question
   b. Methods/Approach: Identify the necessary disciplines or subdisciplines you would draw on to address your research question, including descriptions of any theories or theoretical frameworks that relate to the issue, describe the necessary data types and method of acquisition (primary or secondary) and where would you find/how would you collect the data; describe the analytical methods/analyses you would need to perform, and describe what approach you would use to integrate your data
   c. Describe the challenges you anticipate with integrating these data
   d. Describe who would be interested in your results and for what purpose
Diversity

CRM/ICS PhD Graduation Trends

2015-2016
2016-2017
2017-2018
2018-2019
2019-2020

Number of graduates (annual)

Females
Males

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Number of graduates (annual)

2015-2016
2016-2017
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Females
Males
Pillars of a Successful PhD Program

- Faculty Mentorship
- Student Scholarship & Achievement
- Rigor
- Diversity
- Assessment
Faculty External Awards Supporting Student Stipends

Funding Source for PhD Student Stipends (2021-2022)

- Graduate School (30%)
- Integrated Coastal Programs (20%)
- External Awards (50%)
CRM/ICS PhD Enrollment Trends

<table>
<thead>
<tr>
<th>Year</th>
<th>Applicants</th>
<th>Admitted</th>
<th>Newly Enrolled</th>
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<tbody>
<tr>
<td>2015-2016</td>
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<td>2019-2020</td>
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<td>2020-2021</td>
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<td>Milestone</td>
<td>Year 1</td>
<td>Year 2</td>
<td>Year 3</td>
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<tr>
<td>Core Course Completion</td>
<td>FALL</td>
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<tr>
<td>Completion of other courses</td>
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<td>Selection of major professor</td>
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<td>Core Competency Exam</td>
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<td>Selection of Advisory Committee</td>
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<td>Dissertation Proposal Defense</td>
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<td>Conduct Research</td>
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<td>Dissertation Defense</td>
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<td>Submission of Dissertation to Graduate School</td>
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Alumni Employment (2020)

- Private Sector (15%)
- State Government (15%)
- Federal Government (33%)
- Academia (36%)
Future Plans

• Undergraduate and master’s degree feeder programs
• Engagement with HBCU and other diverse platforms
• Facilitating student-led fellowships
• Alum guest speaker series
• Alumni capital for student research needs
Questions??
NRT = National Science Foundation Research Traineeship Program

Nationally prestigious program to train graduate students as leaders in the academic and non-academic workforce.

NSF Goals:
• Catalyze interdisciplinary research
• Produce diverse STEM professionals
• Promote transformative graduate education
Coastal Community Environmental Data Scholars (CCEDS)

~$2M
Why:
Prepare students to apply *data science* to help *communities* adapt to change.
CCEDS

Key Training Elements:

• Graduate Certificate in Applied Data Science
• Community-Based Research
• Communications Training
Who is this for?

- ECU MS or PhD student from any field relevant to community or env resilience
- Interest in *using* data science in your research
- Desire to make a difference for communities