Institutional Effectiveness
2018-2019

Program: Environmental Sciences Ph.D.

College and Department: College of Interdisciplinary Studies – School of Environmental Studies

Contact: Dr. Hayden Mattingly

Mission: The Environmental Sciences (EVS) doctoral program's mission is to advance the knowledge and promote the leadership necessary to understanding natural environments by incorporating perspectives from social sciences, humanities, and environmental sciences in the program's teaching and research in the fields of natural resources and the environment.

Concentrations: There are five concentrations available within the EVS Ph.D. program:

(1) Agriculture; (2) Biology; (3) Chemistry; (4) Geosciences; and (5) Integrated Research.

The Agriculture, Geosciences, and Integrated Research concentrations were officially added in Spring 2018.

Student Learning Outcomes

1.1. Students will demonstrate understanding of the interdisciplinary nature of environmental sciences such that they are aware of a wide range of environmental concerns beyond the boundaries of any single, specific discipline.

2.1. Students will improve oral and written communication skills by giving technical presentations at symposia, conferences, and similar venues where abstracts are peer-reviewed for acceptance.

2.2. Students will improve written communication skills by submitting manuscripts to peer-reviewed publications such as scholarly journals, conference proceedings, books, or similar outlets.

A departmentally developed curriculum map can be found in Appendix 1 that shows the connections between courses and student learning outcomes.

Results:

1.1. Students will demonstrate understanding of the interdisciplinary nature of environmental sciences

Table 2. EVS student activities during the reporting period of January through December 2018 in the

- **Cody Godwin,** Oliver Ljustina, and James Erdmann. 2018. Natural History Notes: *Gastrophryne carolinensis* (Eastern Narrow-mouthed Toad). Arboreal activity. *Herpetological Review* 49(1): 95-96.
- **Cody Godwin** and Andrew Moore. 2018. Geographic Distribution: *Carphophis amoenus helenae* (Midwestern Wormsnake). *Herpetological Review* 49(4): 717.
- James Erdmann, **Cody Godwin**, Martha Villalba-Guerra, Cooper Campbell, Jordan Donini, Elyse Parker, Ariana Rupp, Courtney Weyand, Melanie Partin, Timothy Borgardt, and Christopher Beachy. 2018. Larval life history of *Lithobates sphenocephalus* (Southern Leopard Frog) in Southeast Louisiana. *Southeastern Naturalist* 17(2): 221-229.
- Kristen Bouska, Amanda Rosenberger, Stephen McMurray, Garth Lindner, and **Kayla Key**. 2018. State-level freshwater mussel programs: current status and a research framework to aid in mussel management and conservation. *Fisheries* 43(8): 345-360.

Program Goal 3: Add new concentrations to the Environmental Sciences PhD program.

The number of concentrations in the EVS PhD program increased from two in 2016 to five in 2017 (with formal THEC approval received in Spring 2018). There is a possibility of adding one or more concentrations in the future, pending future deliberations of the EVS Executive Committee. Recent committee discussions have also included the possibility adding a low-residency option to the program.

Modifications for Improvement:

Outcome 1.1 (student understanding of interdisciplinary nature of environmental sciences):

Currently, the existing assessment approach for interdisciplinary evaluation of comprehensive exams is recognized as being too coarse (i.e., we can only say how many students passed the exams and provide a qualitative description of the exams). Therefore, a more quantitative rubric was drafted by the EVS Curriculum Committee in 2017-2018 to provide a refined, commonly used tool for assessing student interdisciplinary performance on their exams. The EVS Curriculum Committee suggested minor changes to the rubric prior to its presentation to the EVS Executive Committee. The rubric was approved by the executive committee, but the addition of the three new concentrations in Spring 2018 will necessitate further revisions to the rubric. In short, the rubric is still in a phase of revision and has not been implemented as an assessment tool.

As part of emphasizing the interdisciplinary nature of environmental sciences, the EVS Curriculum Committee presented a short narrative to the EVS Executive Committee for approval in 2018. The narrative was designed to inform students about interdisciplinary learning and to better communicate faculty expectations about interdisciplinary learning associated w-0.6 (u.9 (e6 (t)-3h(d)2.3 (t)-2.9 (d)2.2 (e)-3 ( )10.6 (c)-1

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Outcome 2.2 (student publications and communication skills):

The EVS 7900 Scientific Writing and Grantsmanship course was altered in 2016 to allow students the option to develop a journal manuscript (instead of only allowing a grant proposal). In 2018, many of the EVS 7900 students elected to prepare a journal manuscript and worked one-on-one with the instructor during editing sessions. In addition, the EVS Executive Committee created a new policy, effective for students starting the program on or after August 1, 2017, to require doctoral students to submit at least a portion of their dissertation for peer review before they can defend their dissertation. The new policy was submitted to GSEC and has now been approved and finalized. The implementation date for the peer-review policy was August 2, 2017. We expect this new policy to further increase student proficiency in their scientific writing and publication skills.

Program Goal 3:

The EVS Executive Committee has set a future goal of having a total of six concentrations. Discussions will occur in 2019 to determine how to move forward with adding one or more new concentrations to support the growth and health of the EVS program. The committee will also continue to address the possible addition of a low-residency option to make the program available to those students living some distance away from Cookeville.

Appendices

1. Curriculum Map