Institutional Effectiveness 2020-2021

Program:Environmental Sciences Ph.D.

College and Department: College of Interdisciplinary Studieshool of Environmental Studies

Contact:Dr. Steve Sharp

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 iprogram'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) alter Research.

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

Program Goad:

- PG 1: Environmental Sciences students will receive detailed interdisciplinary training and experience to enable them to address complex environmental problems with greater effectiveness.
- PG 2: EVS student research projects will be peeriewed and widely recognized for their innovation and relevance to environmental concerns.
- PG 3: Add new concentrations to the Environmental ScierRes program.

Student Learning Outcomes

SLO 1: Students will demonstrate understanding of the interdisciplinary nature of environmental scienceStsudemtshatilheypaaseawaiteofcomidemargieofskillsinoynstemtattingnoeanstarjpts(tc) (takie) (e)e9 (ye) 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.

Assessment Methods:

 Comprehensive Exams - Outcome 1.1: The EVS faculty will monitor student understanding of the interdisciplinary nature of environmental science by the administration of oral and written comprehensive examsThecomprehensive exam is interdisciplinary and is comprised of questions written by each member of the graduate advisory committee results of these exams are kept on file by the EVS Director.

The timing of the comprehensive exams represents an ideal to provide prive for assessment because the student has just completed all or nearly all of his/her coursework. The exams are provided in two different formats (written and oral) that allow better insight into the student's interdisciplinary knowledge and proficiency. The student's graduate advisory committee discusses the results and provides paper copies of the exams to the Director, who monitors the results to maintain integrity and consistency.

2. Student Annual Reports - Outcomes 2.1 and 2.2: In December of eachear, the program Director requests annual reports from each student that cover the previousnot the period. Reports are due by the end of JanuaryFor example, student reports received in January 2019 covered the reporting period of JanuaryPecember 208. Students are provided with a template to follow when preparing reports. The Director and academic staff members review each report and tally the total number of presentations and publications generated by students during the reporting period.

EVS students are required to submit an annual report to allow direct assessment of student productivity and development of written and communication skills in terms of presentations and publications. The report template also requires additional details regardingnature of the presentation or publicationFor example, the presentation might be at an international conference rather than a state meeting, or the publication might be in a **high**act journal as opposed to a regional journal. These details can besed to generate a more refined analysis of the TTU EVS program's impact on the wider discipline of environmental scienders ual reports have the added benefit of student professional development because their CVs are current and updated with each successive year's accomplishments.

3. Annual count of number of concentrations - Program Goal 3:

Results:

PG 1: Environmental Sciences students will receive detailed interdisciplinary training and experience to enable them to address complex environmental problems with greater effectiveness.

Students continue to receive quality instruction and support from the available of disciplines, included but not limited to biology, chemistry, geosciences, agriculture and social policy.

In Fall 2020, the Executive Committee discussed the strengths and weaknesses of the current EVS interdisciplinary core curriculumIt was decided that the EVS Curriculum Committee, which also include student representatives, would study the matter more carefully and bring recommendations back to the Executive Committee in Spring 2021. Tentative recommendations from this group halked a 3 course core curriculum instead of the currence durse core, with one of the three courses being an interdisciplinary seminabased course in environmental sciences. These efforts are targeted to produce more consistent and effective understanding of the interdisciplinary aspects of the degree program.

In Spring 2021, the Executive Committee discussed at length several potential changes to the core course curriculum but could not come to a consensus as to which direction to go. The matter was referred back to SOESaldership for further refinement in order

pending future deliberations of the EVS Executive Committee. Recent committee discussions have included the possibility f adding a low residency option to the program.

SLO 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.

Two EVS students, one in the Integrated Research Concentration and the other in the Biology Concentration, successfully completed their comprehensive exams during the **2023** (reporting period. Student performance and interdisciplinary proficiency or how the and oral aspects were approved by the EVS faculty graduate advisory committees.

The School of Environmental Studies recently **crebM**icrosoft Teams groups for each student's dissertation committee to facilitate interdisciplinary collaborations collegiality among committee members. The Teams group is a location where the comprehensive exam questions, answers, and grades can be uploaded for easy access and viewing in a secure fashion.

SLO 2: 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.

The School of Environmental Studies provides supplemental support for student travel to meetings for the purposes of making presentations. Although many conferences were cancelled or switched to virtual, SOES continued to provide conference support for students as needed. The School will continue to place a priority on supporting student travel to scientific conferences.

SLO 3: Students will improve written communication skills by submitting manuscripts to peer-reviewed publications such as scholarly journals, conference proceedings, books, or similar outlets.

Student written and oral measures of productivity in 2020 were down in most areas as compared to recent years. This undoubtedly was due in large pathe COVID19 pandemic. Conferences were cancelled, field research was hampered, and some students were in a quandary as to how to move forward. Interestingly, the one area which there was a substantial increase was poster presentations (n = 25). The majority of these \neq 14), however, were from two students. One **EbiG**ogy student presented eight posters and another one submitted six. The number of manuscripts publis2020 (n = 12) was more in line with 2016, 2017 and 2018 (**Tablend 2**). The twelve manuscripts published in 2020 appeared in a range of journals (Table 3). **EbiGensits** were first authors in severif the twelve publications.

In 2016, the EVS 7900 Scientific Writing and Grantsmanship electivese was changed allow students the option of developing a journal manuscrip? reviously, students were required to submit a grant proposal. In recent years, maby S 7900 students he elected to prepare a journal manuscript and worked oncon-

The EVS Executive Committee created a new podice quire doctoral students to submit a portion of their dissertation for peer review before they can defend their dissertation. The new podicy approved by GSEC and became effective in August 2701/87 new policy should further increase dent proficiency .9 (re)-9.6 (t) o iefuntiiefue341 [(s)6.6 (t)st-2.9 (i)-9.6 (t)otti341 [(s)aef t-k (ef)13.lls

Table 3. Twelvejournal publications from 2020 o-authored by EVS Ph.D. students (names shown in bold text).

Manuscripts Published

- BlakeBradshaw, A.G.Lancaster, J.D., O'Connell, J.R., Eichholz, M.W., Matthews, J.W., and Hagy, H.M. 2020. Suitability of wetlands for migrating and breeding wateiibiildisnois. *Wetlands* 40, 1993 –2010.<u>https://doi.org/10.1007/s13157920-012767</u>
- 2) Geographic distribution Agkistrodon contortri(Eastern Copperhead) Herpetological Review H. BiTJy[J66.,16@d(v7.9 i8)(2)81t(1tm))2.8 tt(7.9 (e (w)2)d)2.3 (in Tf 0.005-6 (t)-5.0.3 (n)10.C(M)-7.. D(c)-5Td (

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Modifications for Improvement

PG 1: Environmental Sciences students will receive detailed interdisciplinary training and experience to enable them to address complex environmental problems with greater effectiveness.

In aSpring 202 EVS Executive Committeeting, a matrix of options for revising the EVS PhD core course requirements was discussed at great length. Different academic units explictees to concerns about the current core courses. Faculty also expressed a variety of concerns about the various core course options presented. In the end there was a lack of consensus on the best way to modify the core course requirements to meet the needs of the students. The committee was reminded that the EVS

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 necessitated further revisions to the rubric. The rubric is slated to be implemented in the 20212022 academic year. Additionally, in order to track specific students' interdisciplinary knowledge, the EVS Executive Committee will consider the possibility of creating a test bank of interdisciplinary learning questions that could be used during the comprehensive exams.

SLO 3: Students will improve written communication skills by submitting manuscripts to peer-reviewed publications such as scholarly journals, conference proceedings, books, or similar outlets.

SOES will develop qualitative and quantitative measures of writtem comication skills to track progress. These could include such things as student perception of growth in written communication after taking the EVS 7900 Scientific Writing and Grantsmaces bipse. It could also include prend post-test measures of writig skills that could be included within the course. Additionally, the school will begin tracking the ratio of manuscripts submitted to manuscripts published.

Appendices

1. Curriculum Map