

# Affordable Learning Georgia Textbook Transformation Grants

## Final Report

**Date:** Dec. 15, 2015

**Grant Number:** 109

**Institution Name(s):** Georgia College & State University

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**Project Lead:** Caralyn Zehnder

**Course Name(s) and Course Numbers:** ENSC 1000. Introduction to Environmental Science

**Semester Project Began:** Spring 2015

**Semester(s) of Implementation:** Fall 2015

**Average Number of Students Per Course Section:** 24-60

**Number of Course Sections Affected by Implementation:** 9 per year

**Total Number of Students Affected by Implementation:** 452 per year

### 1. Narrative

Our project goals were to 1) reduce the cost to students in all sections of our Introduction to Environmental Science (ENSC 1000) course by replacing the traditional textbook with no-cost, open access learning materials, 2) develop Environmental Science educational materials that are sustainable, current, and specific to the learning outcomes of our course, and 3) design and share materials on a LibGuide (Library-Specific Springshare Product) that will serve as an easily accessible resource guide for students, as well as faculty at other institutions.

We successfully met all of our project goals and were able to use our new textbook in our four fall 2015 sections of ENSC 1000. Our program will continue to use this free, OER textbook in this class for the foreseeable future. This means that our students will not have to spend over \$150 per student on a textbook that they would only use in this one class. Importantly, our new OER textbook is focused on the information that we cover in our course, and so students are not stuck buying an expensive textbook and then not using all of it. Additionally, our textbook is relevant and up-to-date, which is very important in a field like Environmental Science the changes rapidly.

Our work began during the spring semester of 2015. Our team met multiple times throughout the semester to work on this project. We developed the framework for our open access material, assigned individuals to specific topics, developed student learning outcomes for each module, and created outlines for each module.

During the summer of 2015, we collaboratively wrote our textbook. The five Environmental Science faculty each wrote one or two chapters. Additionally, we all reviewed and commented upon each other's work. As we finished the chapters, our librarian uploaded the documents and appropriate links to our LibGuide and added the appropriate creative commons license. She also reviewed the chapters for content clarity, formatting and citations.

This fall, we implemented our new textbook in all four sections of ENSC 1000, including our majors-only section. This affected approximately 200 students. We posted links to our LibGuide in GeorgiaView and explained to students how they would access their new (free!) textbook. Our students were easily able to access the material and the student feedback was overwhelming positive. They were very excited about not having to purchase a book and they also felt that this material was worth reading since it was written by their professors. They saw how the OER textbook and lecture activities complemented each other and many students commented that they liked that our textbook didn't contain a lot of irrelevant "fluff". Mid-semester, we administered a survey in two sections of ENSC 1000 and asked students to comment on chapters 1-6. We will use this feedback in future revisions.

In terms of lessons learned, like many projects this one was very time consuming - especially writing the material. We would have preferred to have more occasions to discuss the various course topics, but it was hard to find time to bring everyone together over the summer. Ideally, it would have been great to have a week-long writing retreat. Also we need to work on making our book more cohesive. It was obvious to our students that different chapters were authored by different individuals, so in the future we will try to present a more unified voice. Additionally, some chapters included practice questions and a list of vocabulary terms, while other did not. We want to have a standardized format for our materials, so we plan on adding these additions to the chapters that originally lacked them.

For a majority of our students, ENSC 1000 is one of only two college science courses that they will enroll in. We want this course to be exciting, relevant and to 'hook' students onto science. Environmental Science can be extremely engaging and many students are motivated to learn this subject because it has direct connections to their lives and to events in the news. A traditional textbook cannot keep up with this rapidly changing field or include the latest environmental news. Our new "textbook" gives us the flexibility to include the latest scientific breakthroughs and news stories. And the committee will review our course material annually to ensure that it stays up-to-date and we will incorporate student feedback into our reviews.

## 2. Quotes (all from students enrolled in ENSC 1000, Fall 2015)

"I really like that I don't have to buy a book. Textbooks are so expensive and I am supporting myself through college."

"The chapter learning outcomes are very clear because they are basically an outline of the ch. 2 material. They use key terms and say exactly what you need to know about the material associated with that term."

"There was a lot of information in this chapter, but I felt like it was all incredibly necessary. I felt like this chapter was very important and a lot of the information on the exam came from this chapter."

"It's so easy for me to look up material in class since my textbook is online."

## 3. Quantitative and Qualitative Measures

### 3a. Overall Measurements

#### Student Opinion of Materials

**Was the overall student opinion about the materials used in the course positive, neutral, or negative?**

Total number of students affected in this project: \_\_183 (this semester only more will be affected in the future). \_\_\_\_\_

- Positive: \_\_76\_\_ % of \_\_72\_\_ number of respondents
- Neutral: \_\_14\_\_ % of \_\_72\_\_ number of respondents
- Negative: \_\_10\_\_ % of \_\_72\_\_ number of respondents

#### Student Learning Outcomes and Grades

**Was the overall comparative impact on student performance in terms of learning outcomes and grades in the semester(s) of implementation over previous semesters positive, neutral, or negative?**

Choose One:

- Positive: Higher performance outcomes measured over previous semester(s)
- Neutral: Same performance outcomes over previous semester(s)
- Negative: Lower performance outcomes over previous semester(s)

#### Student Drop/Fail/Withdraw (DFW) Rates

**Was the overall comparative impact on Drop/Fail/Withdraw (DFW) rates in the semester(s) of implementation over previous semesters positive, neutral, or negative?**

**Drop/Fail/Withdraw Rate:**

7.1 % of students, out of a total 183 students affected, dropped/failed/withdrew from the course in the final semester of implementation.

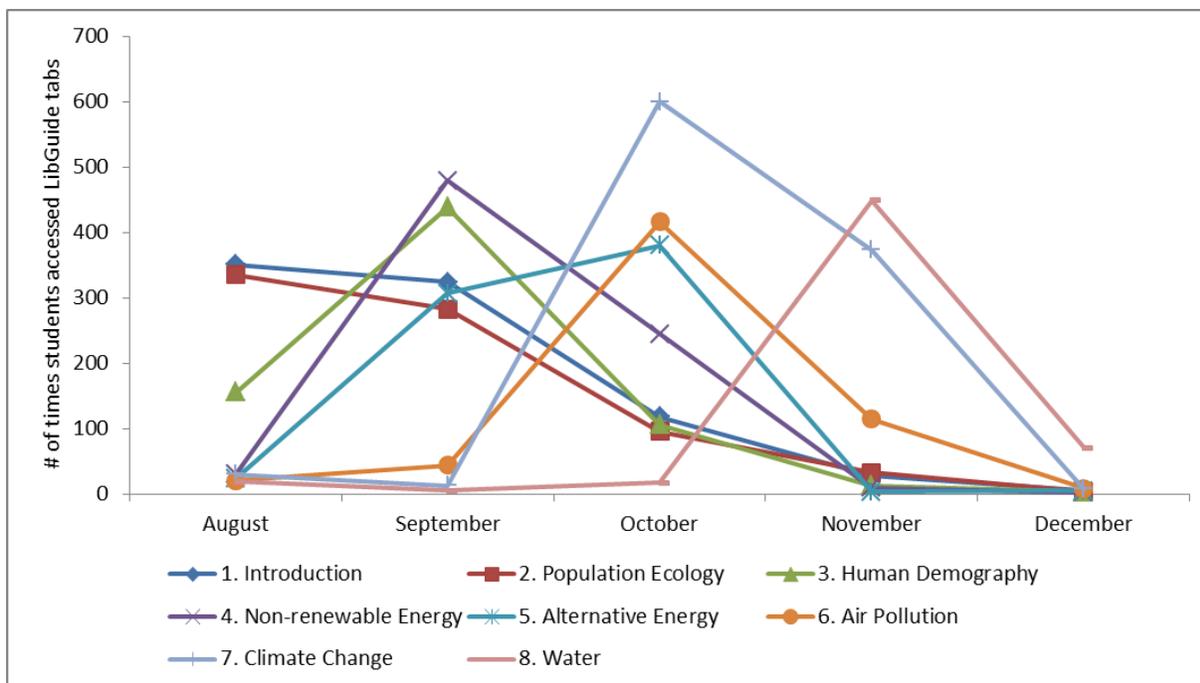
Choose One:

- Positive: This is a lower percentage of students with D/F/W than previous semester(s)
- Neutral: This is the same percentage of students with D/F/W than previous semester(s)
- x Negative: This is a higher percentage of students with D/F/W than previous semester(s)

**3b. Narrative**

Overall the students were happy with the OER Environmental Science textbook that the committee created. Initially some of the students were a little confused about having an online textbook, especially since many of the students enrolled in ENSC 1000 are first semester freshmen. However, the instructors regularly explained how to access the textbook and posted links on GeorgiaView (D2L) to help students find the resource. Many of the students chose to print off the chapter pdfs so that they could write notes and highlight the material. Some of the student learning outcomes were unclear and need further clarification. Additionally, some chapters need to include more examples and explanations – based on student feedback. However, a majority of the students found the material to be clear and easy to understand.

Students regularly accessed the LibGuide material. There were 6890 separate LibGuide accesses by students during the fall semester, which means that each student accessed the LibGuide 37 times during the semester. Figure 1 shows the number of times that each chapter was accessed by students each month. You can see the pattern of chapters taught throughout the semester. Chapters 1 and 2 were taught in August, so that is when students access this material and then they accessed this material again before exam 1 in September. We were initially surprised by how few students accessed the LibGuide in December during finals weeks. However, it is likely that many of the students downloaded the chapter pdf during a previous visit to the LibGuide. Also the December data only includes Dec. 1-4, and finals were Dec. 8-11. So it is very likely that many students returned to the LibGuide while studying during finals week.



**Figure 1:** The number of times that students accessed the Libguide material each month. Each line represents a different chapter.

In terms of student performance, a higher percentage of students earned “As” in 2015 than in 2014. However, a greater percentage of students dropped the course or failed the course in 2015 compared to 2014. Taken together, the data indicate that the textbook transformative did not have a strong impact on student performance in terms of learning and grades.

**Table 1:** Compares the grade distribution for Fall 2015 (implementation of new textbook) and Fall 2014 (traditional textbook). The instructors for ENSC 1000 were the same for both years.

|           | A          | B          | C          | D         | F        | W        | TOTAL |
|-----------|------------|------------|------------|-----------|----------|----------|-------|
| Fall 2015 | 49 (26.8%) | 77 (42.1%) | 32 (17.5%) | 12 (6.6%) | 5 (2.7%) | 8 (4.4%) | 183   |
| Fall 2014 | 45 (23.1%) | 90 (46.2%) | 44 (22.6%) | 12 (6.2%) | 3 (1.5%) | 1 (.5%)  | 195   |

When the ENSC committee discussed the slightly higher number of withdrawals in 2015 compared to 2014, we decided that it seems unlikely that the withdrawals can be attributed to the textbook. Two of this year’s withdrawals were because of medical reasons and the other students who dropped the class before midterm were all student who were not attending class, failed to turn in assignments, and subsequently did very poorly on the first two exams. It is unlikely that these students were using the OER textbook and it is unlikely that the textbook affected their decision on whether or not to drop the class. The DWF rates for ENSC 1000 are comparable to other Area D non-science majors courses. For example, the W rate for BIOL 1100 was 4.5% in Fall 2015. We will continue to examine the DFW rates in the future.

#### **4. Sustainability Plan**

Our plan is very sustainable. The Department of Biological & Environmental Sciences is committed to offering ENSC 1000 every semester and the ENSC faculty members are committed to using our new material in all subsequent sections and not requiring students to purchase a traditional textbook. ENSC 1000 is regularly assessed by our program, both as part of Area D core assessment and as part of our regular program assessment. Therefore, we regularly review how well students meet the learning outcomes and we also evaluate student feedback. We will review course material on an annual basis, create new material as needed and delete outdated information.

#### **5. Future Plans**

This project has helped us also reflect on how students use our course materials. Additionally, we have noticed that many of our students come to college lacking the ability to read college-level textbook materials. We are considering adding more study guides to our OER material to help students learn the content and also develop their reading skills.

We will continue collecting student feedback on our OER textbook and also continue collecting data on student learning outcomes. We hope to publish our work in an appropriate STEM-SOTL journal in the future and potentially present at the USG Teaching and Learning Conference or the STEM-SOTL conference at Georgia Southern.

#### **6. Description of Photograph**

Environmental Science students participating in a class activity in Dr. Mutiti's class.