

Affordable Learning Georgia Textbook Transformation Grants
Round 2
Summer 2015, Fall 2015, Spring 2016
Proposal Form and Narrative

Institution Name(s)	Georgia College & State University				
Team Members (Name, Title, Department, Institutions if different, and email address for each)	Caralyn Zehnder, Associate Professor, caralyn.zehnder@gcsu.edu Kalina Manoylov, Associate Professor, kalina.manoylov@gcsu.edu Samuel Mutiti, Associate Professor, samuel.mutiti@gcsu.edu Christine Mutiti, Lecturer, christine.mutiti@gcsu.edu Allison VandeVoort, Assistant Professor, allison.vandervoort@gcsu.edu Department of Biological and Environmental Sciences Donna Bennett, Associate Director for Collection and Resource Services, Russell Library, donna.bennett@gcsu.edu				
Sponsor, Title, Department, Institution	Kelli Brown, Provost, Academic Affairs, Georgia College & State University				
Course Names, Course Numbers and Semesters Offered	ENSC 1000 Intro to Environmental Science, Fall 2015, Spring 2016, Summer 2016				
Average Number of Students Per Course Section	24-60	Number of Course Sections Affected by Implementation in Academic Year 2016	9	Total Number of Students Affected by Implementation in Academic Year 2016	452
Award Category (pick one)	<input type="checkbox"/> No-Cost-to-Students Learning Materials <input type="checkbox"/> OpenStax Textbooks <input type="checkbox"/> Course Pack Pilots <input checked="" type="checkbox"/> Transformations-at-Scale				
List the original course materials for students (including title, whether optional or required, & cost for each item)	<i>Essential Environment: The Science behind the Stories - 5th edition by Jay H. Withgott, Pearson (required)</i>			[Cost] \$152.00/student Total Cost \$68,704	
Plan for Hosting Materials	<input type="checkbox"/> OpenStax CNX <input checked="" type="checkbox"/> D2L <input checked="" type="checkbox"/> LibGuides <input type="checkbox"/> Other _____				
Projected Per Student Cost	\$0/student		Projected Per Student Savings (%)	100%	

Title: Ditching the textbook! Developing material for a textbook free Introduction to Environmental Science (ENSC 1000)

1. Project Goals

Our project goals are 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.

1.1 Statement of Transformation

Description of transformation: Each year, the Department of Biological & Environmental Sciences offers nine sections of ENSC 1000 (4 fall, 4 spring, 1 summer) to approximately 452 students. This course satisfies the Area D science requirement for non-science and science majors and it is a required course for Environmental Science (ENSC) majors and minors. Over the past 8 years the ENSC Committee has tried three different textbooks. However, we have not been satisfied with any of them because of two major drawbacks associated with all Environmental Science textbooks: 1) the books are out of date as soon as they are printed because Environmental Science is such a rapidly advancing field and 2) the books are too broad and include many chapters that we cannot cover in a single semester course. For example, in our current text we assign 9 of the 18 chapters. Drawback #2 leaves students extremely dissatisfied with the textbook and frustrated that they have to spend so much money and use so little of the book. Most ENSC 1000 students are non-science majors, so they have little interest in retaining their textbooks for later use. In two fall 2011 sections of ENSC 1000, we surveyed 118 students using a Student Assessment of their Learning Gains (<http://salgsite.org/>) and 25% of the students responded that the textbook provided “little” or “no help” in their learning and another 27% rated the textbook as only moderately helpful. A mere 4% of students gave the textbook the highest rating (great help). Student comments about the textbook include “I didn’t really use the book.” “The book didn’t help me much at all compared to the lecture. It was a waste of money.” “I never opened the book.” “I feel like students did not need the book.” By replacing our traditional textbook with freely available course materials, **each student will save \$152, for an estimated annual savings of \$68,704.**

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. Developing our own material will give 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.

Stakeholders affected by the transformation and a description of this impact: Our students will be the direct beneficiaries of this textbook transformation. Our students will save money and they will have course materials that are well aligned with ENSC 1000 course requirements. Additionally, this transformation will directly benefit the 5 faculty in the Department of Biological and Environmental Sciences who regularly teach ENSC 1000, since access to better aligned, more current resources favorably impacts the quality of our teaching. And as we share these materials with colleagues at other USG schools and publish these materials on MERLOT, (a curated collection of free online learning materials), then other faculty will also benefit.

Impact on the program and department. ENSC 1000 is one of the top core courses offered by our Department, and all faculty who teach ENSC 1000 are on board for replacing the textbook with freely available course material. Moreover, ENSC 1000 is a required course for all Environmental Science majors and minors and it is often the first college science course that our students take. While majors makeup less than 10% of the students enrolled in ENSC 1000/1000L, retaining these students is of upmost importance to us. Science majors typically spend hundreds of dollars per semester on textbooks, so reducing this cost in any way can help with retention. Additionally, many of our students, both majors and non-majors, enroll in ENSC 1000 because they are interested in going 'green' and not requiring students to purchase a textbook saves resources and supports the idea of sustainability. Some of the course material that we develop for ENSC 1000 can also be used in other courses within the department, so these materials will benefit students beyond the ones enrolled in ENSC 1000.

1.2 Transformation Action Plan

1. Identify and review appropriate no-cost materials that align with ENSC 1000 learning outcomes. In ENSC 1000, students learn about a wide range of topics including population ecology, demography, energy, climate change, air pollution, and water, in addition to applying the scientific method, and developing skills in reading and interpreting graphs. Additionally, this course has a Global Perspectives Overlay and, therefore, all of the topics include examples from multiple countries and students examine environmental issues from multiple perspectives. Course material available on open access sites such as MERLOT already meets some of our learning outcomes. Additionally, a National Science Foundation -funded consortium of community colleges recently developed a suite of open access course materials including a track on Environmental Technology. These materials will be available in Spring 2015, and will also be included in our review. Additional resources include articles from National Geographic and Scientific American, which are available through Galileo, as well as datasets and Open Educational Resources (OER) available from government websites (National Oceanic and Atmospheric Administration, Environmental Protection Agency, United States Geological Society) and scientific organizations (American Association for the Advancement of Science, Ecological Society of America, Geological Society of America).
2. Map available resources to learning outcomes and identify gaps. These gaps will provide the blueprint for the new material that we will create.
3. Develop new materials. This will include identifying relevant textbook chapters, formative assessment (self quizzes), class handouts for group activities and summative assessments (exams). Each environmental science faculty member will write and develop appropriate material for their topic.
 - a. C. Zehnder (project leader): Population ecology & human demography
 - b. K. Manoylov: Energy (renewable resources: solar, biofuels, wind, geothermal)
 - c. C. Mutiti: Energy and air pollution (non-renewable resources: coal, oil, natural gas, nuclear)
 - d. S. Mutiti: Water (water management, water pollution)
 - e. A. VandeVoort: Climate change (causes and consequences)
4. Organize materials for open access. After we review each other's course material, we will consider how to best present these materials using both D2L and LibGuides.
 - a. D. Bennett: Develop LibGuide and provide LibGuide training for ENSC faculty.
5. Review our current ENSC 1000 syllabus and instructional activities. We plan on keeping the basic ENSC 1000 course structure and student learning outcomes. However, we will need to revise our assessments and in-class activities based on the new material. Additionally, we will

also develop mini video lectures of some topics, so instructors can use a ‘flipped’ classroom approach when this pedagogy is appropriate.

6. Teach course. In Fall 2015, Drs. Zehnder and VandeVoort will teach two sections each of ENSC 1000, Drs. Manoylov and C. Mutiti will each teach two sections in Spring 2016 and Dr. S. Mutiti will teach one section in summer 2016. All instructors will use the new course materials in place of the previously required textbook. Based on assessment data, we will revise course material as necessary. We will share challenges and successes through regular meetings.
7. Assessment. Please see the section on Quantitative and Qualitative measures below.
8. Dissemination of material. Some of the material developed for ENSC 1000 will also be used in our new, proposed, core, online course, ENSC 1050: Sustainability and the World Population. Additionally, ENSC 1000 is similar to other USG courses including Ecological Basis of Environmental Issues (ECOL 1000) and Environmental Science (ENVS 2202), so some of our materials will be transferable to these courses. We will present our results at state and regional meetings including the USG Teaching & Learning Conference and the USG STEM-SOTL conference. If our proposal is funded, we will submit a proposal to the Georgia College IRB to collect data on student learning and course satisfaction both pre and post textbook transformation. We will publish our results in suitable journals such as *Innovative Higher Education* or the *Journal of College Science Teaching*. As appropriate, we will publish our course material on open access sites such as MERLOT.

1.3 Quantitative and Qualitative Measures

Quantitative Measures. We will assess student performance using exam questions and assignments that align with the course learning outcomes. These results will be compared with student performance in previous, textbook-based versions of the course. We hypothesize that more students will meet the course outcomes after we replace the textbook because the new material will be more closely aligned with the course learning outcomes. Additionally, we will compare DFW rates both before and after the textbook transformation to determine if the no-cost format increases student retention and decreases course failure rates.

Qualitative Measures. Students in the 2015 spring and summer sections taught with a traditional textbook and in all transformed sections (Fall 2015 and onward) will complete a Student Assessment of their Learning Gains (www.salgsite.org) at the end of the course. Part of this survey specifically asks students to rate how well the course resources such as the textbook and online materials, helped their learning. Students also self-describe the learning gains they made for each student learning outcome. We will compare student scores and comments both before and after the textbook transformation.

1.4 Timeline

Action	Timeframe
Review available OERs (MERLOT, NSF, USGS, AAAS, etc).	Spring 2015
Map available resources to student learning outcomes.	Spring 2015
Submit interim status report to ALG.	Late Spring 2015
Develop materials.	Summer 2015
Organize materials into a LibGuide. Organize course on D2L.	Summer 2015
Revise ENSC 1000 instructional activities	Summer 2015
Teach ENSC 1000, 4 sections (~200 students) using new material.	Fall 2015
Assessment in ENSC 1000.	December 2015
Analyze assessment data.	December 2015
Submit final report to ALG.	December 2015

1.5 Budget

Drs. Zehnder, Manoylov, Mutiti, Mutiti, and VandeVoort will receive summer pay totaling \$5,000 salary and benefits. Ms. Bennett will receive a contract overload totaling \$5,000 salary and benefits. The total budget request is \$30,000.

1.6 Sustainability

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.

All ENSC 1000 instructors currently use D2L in their classes, so it makes sense for us to continue to use this course management software. D2L allows instructors to easily rollover course content into future classes or to share content across concurrent courses. In addition to the material that we create and post on D2L, the course also will rely on articles provided to students via GALILEO, the University System of Georgia's virtual library. Course materials will also be shared using a LibGuide. LibGuides are easy to create and edit, offer flexible design, and can be edited by multiple users. Files, links, widgets, video and more can be embedded in the guides. Russell Library currently provides many course guides containing research help and supplemental materials, so students are already comfortable using these resources. In addition, LibGuide usage can be tracked through page views, providing feedback to guide creators. Sharing is encouraged and facilitated in the LibGuides Community, and so course materials can be easily shared with USG and other interested schools.

1.7 References

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December 2, 2014

Dear Review Board,

On behalf of Georgia College in Milledgeville, I am pleased to offer this letter of support for our institution's **Affordable Learning Georgia** Textbook Transformation grant application. Georgia College is requesting funding for the creation of "No-Cost-to-Students" Learning Materials for college Environmental Science courses, the development of which will be spearheaded by a team of faculty from Biological and Environmental Sciences and supported by Associate Director for Collection and Resource Services of Russell Library, Donna Bennett. Each year, Georgia College provides 6,600 undergraduate and graduate students with an exceptional learning environment that extends beyond the classroom, with hands-on involvement with faculty research, community service, residential learning communities, study abroad, and internships. We are the only public institution named as a "College of Distinction" in Georgia for the 8th consecutive year, and our institution is regularly named as a "Best Southeastern College" by the Princeton Review, which places us in the top 25 percent of the nation's four-year colleges.

In 2012, colleges and universities across the nation learned of the one million STEM graduates needed to fill projected employment needs in the next decade. Georgia College is making great strides to advance STEM education by implementing activities such as STEM grant awards for faculty and staff, service learning courses that enable students to work with students and teachers in STEM, and supplemental instruction programs to encourage STEM retention and achievement. Georgia College is also one of seven partner institutions that participate in the USG *STEM Initiative*, which seeks to increase the success and completion rates of college STEM majors. As an additional measure, reducing the financial burden of STEM courses at our institution by providing no-cost learning materials will promote greater student engagement and achievement in STEM fields.

This project will support the creation of online learning materials for ENSV 1000, Introduction to Environmental Science, which is a required course for environmental science majors and also satisfies the science requirement for non-science majors. Approximately 450 students in nine course sections will benefit from replacing the textbook *Essential Environment: The Science Behind the Stories* (5th edition by Jay H. Withgott, Pearson, \$152) with free open access materials. Resulting materials will be sustainable, current, and specific to the learning outcomes of the course. Library-Specific Springshare Products (LibGuides) will enable faculty to design and share materials with students and faculty at other institutions. The Office of the Provost, along with the Office of Grants and Sponsored Projects, will ensure compliance with all State, Board of Regents, and institutional policies and procedures, should we receive funding.

Thank you for your favorable consideration of Georgia College's application. Please contact me should you have any questions regarding this project.

Best Regards,

Kelli Brown, PhD
Provost & Vice President
for Academic Affairs

Milledgeville • Macon • Warner Robins

Georgia College, the state's designated public liberal arts university, combines the educational experience expected at esteemed private liberal arts colleges with the affordability of public higher education.