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RESEARCH ARTICLE

An ecology of resilience: A nature-informed pilot curriculum for improving stress management in college students

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ABSTRACT

Objective: Mental health of college students is a matter of concern, and counseling centers have experienced a surge in demand and strain on capacity to provide services. This study explored the efficacy of a novel, nature-informed stress management curriculum entitled The Ecology of Resilience delivered via a for-credit general education course. The goals were a more favorable perception of stress and increased sense of bouncing back from stress (resilience). **Participants:** One hundred fifty-seven junior- and senior-level undergraduates participated in a project spanning three semesters from January 2022 to April 2023. **Methods:** The Perceived Stress Scale (PSS) and Brief Resilience Scale (BRS) were employed in a pretest/post-test arrangement. **Results:** PSS scores decreased significantly and BRS scores increased significantly for students enrolled in the course versus a control group. **Conclusions:** Curricula like the Ecology of Resilience, presented within the contexts of for-credit academic courses, are viable options for addressing student mental health.

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Introduction

Even before the COVID-19 pandemic, the state of mental health among college students was a growing concern. The combination of separating from families, navigating the new reality of independence, along with handling financial, relationship, and existential questions creates a combination of factors leading to unsettling, if not disruptive, stress for even the most well-adjusted individuals. The effects of these stressors can manifest in poor academic performance and relationship problems,[1] as well as mental health issues such as anxiety, depression, and substance abuse.[1,2] In a larger context, the current state of mental health in children, adolescents, and young adults is a point of great national and global importance, especially in light of and since the COVID-19 pandemic.[2,3]

Encouragingly, as part of a growing trend, discussions about mental health are becoming more normalized.[3–5] In addition, the number of students entering their college experience already having engaged with mental health and/or psychiatric services is on the rise.[6,7] Thanks to a variety of factors, the previous stigma once associated with mental health seems to be diminishing.[8–11]

With the increased willingness of students to discuss mental health and seek help coupled with greater awareness of the availability of resources, counseling centers on most campuses have seen a surge in demand, with many having a waiting list of days to weeks.[12,13] Students reach out to counseling services for various concerns, presenting with needs both clinical (requiring mental health counseling and/or therapy) and sub-clinical (eg needing help with relationships, time management, career planning, or general stress management). Clinicians often do not know the true severity of these presenting problems until one to two sessions with a student have taken place. Providers are challenged to prioritize needs and address this surge with ever-increasing creativity. It is important to have a system in place to prioritize needs during the intake process, a type of triage. One approach utilized by many campus counseling centers is a stepped-care model in which the least resource-intensive strategies are implemented first and increasingly intensive strategies are employed based on individual needs.[14] Students presenting with sub-clinical needs at the lower end of stepped care can often benefit from general psychoeducation presentations, seminars, and workshops around stress management, healthy coping strategies and communication skills, without entry to mental health counseling treatment. To be sure, much progress can be made in non-clinical settings which promote simple mental and emotional wellness.[13,15–17]

A viable option which may hold promise for many campuses is stress management and mental wellness instruction within for-credit academic courses. Academic credit paired with the opportunity to discuss practical and helpful content can provide an effective strategy to potentially reach a large number of students. Herein, we describe an approach in which a general education academic course is used to

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provide information, experiences, and strategies for stress management.

Anderson University (South Carolina) redesigned its general education program prior to the 2017–2018 academic year. Under the new Core Curriculum framework, among standard, traditional courses in communication and historical, scientific, quantitative, social, creative, and intercultural inquiry, students also take a keystone Contemporary Issues (CTI) course near the end of their academic programs. Taught by faculty from a broad variety of disciplines, CTI courses are topical in character and explore current events, societal trends, and contemporary problems including historical factors, recent developments, and potential solutions.[18] Faculty have wide latitude in topics and coverage as long as the overarching course goals of interdisciplinary synthesis, critical thinking, and relevancy are met. The Contemporary Issues paradigm was seen as an excellent opportunity to provide mental health and wellness education, with the added student incentive of satisfying a graduation requirement.

Furthermore, during the time CTI courses were being developed, several undergraduate research projects in the Department of Biology were focusing on the therapeutic values of spending time in natural environments. Historic and current literature indicate substantial interest in the role of nature in producing positive outcomes for factors including cognitive function, cardiovascular physiology, and immune health.[19–25] The Japanese practice of *shinrin-yoku*, or "forest bathing"[26,27] is the focus of a growing body of research for its proposed and realized therapeutic benefits.[25,28–31] Nature-based interventions (NBIs) and experiences in environments dominated by natural features also exhibit tremendous potential for mental health, specifically for calming the human stress response.[28,32–37]

In the spirit of the CTI approach, we proposed and designed a course combining discussions about mental health with the therapeutic value of nature titled "The Biology of Stress and Stress Management." Indeed, such a focus is not unique in the realm of higher education.[38] For example, projects like the Campus Nature Rx Network demonstrate collaborations among institutions and professionals for the purpose of promoting campus mental and physical health through nature engagement teaching, research, and outreach.[39] We believe our course is an innovative contribution to this movement. Moreover, one of the foremost focal points in the college mental health and counseling milieu, and a primary emphasis in our course, is the concept of *resilience* – the ability to bounce back from stress or disturbance.[40–42]

Ecology of resilience model

While none of the basic content in our course was particularly original, it was packaged and delivered using a novel construct termed *The Ecology of Resilience*. In this model, healthy, natural ecosystems are used as a metaphor for psychological wellness. In most natural settings, as long as critical structural and functional components are present, intact ecosystems have the remarkable ability to respond to disturbances and perturbations and return to a relatively stable state, often just as healthy as before – ie they exhibit resilience.[43–45]

Like ecosystems, humans have great capacity for resilience, not just physical but also psychological and emotional. Provided that certain resources are in place, we can handle and bounce back from stressors, both minor and severe, usually returning to a settled and stable state relatively quickly.[46–48] These protective factors can be genetic, social, and cultural, and admittedly, the concept of a suite of factors influencing psychological development and wellbeing is not new.[49–54] However, the way in which we package and present these ideas and strategies in our course using the context of nature-informed stress management is unique. Likewise, the intersection of ecological systems theory with emotional human resilience is germane to conversations regarding mental health, and the possibilities for one to inform the other have surely not been exhausted.

In the interest of cultivating resources into an integrated system for handling and bouncing back from stress, the *Ecology of Resilience* curriculum emphasizes the implementation and maintenance of certain elements and practices organized under three domains: Self-Care, Self-Knowledge, and Community. Topics in the Self-Care domain include exercise, diet, sleep, rest, leisure, and healthy practices such as mindfulness, gratitude, journaling, and forest bathing. The Self-Knowledge domain addresses personal strengths, weaknesses, blind spots, as well as boundaries, motivations, tendencies, personality, authenticity, meaning, purpose, and success. Themes in the Community domain include interpersonal relationships, social support, reciprocal help, service, vulnerability, and unconditional acceptance and love.

Content in the course is organized into seven modules which can be easily incorporated into a 14-week traditional semester or a 7-week summer semester. Modules and topics are arranged as follows:

- Module 1 – Stress and the Human Nervous System
- Module 2 – The Human Stress Response
- Module 3 – The Stress Response in Context/ Measuring the Stress Response
- Module 4 – *Shinrin-yoku*/Theories of Nature-informed Stress Management
- Module 5 – Ecology of Resilience: Self Care
- Module 6 – Ecology of Resilience: Self Knowledge
- Module 7 – Ecology of Resilience: Community

In addition to relevant course material, over the course of the semester, students are required to spend at least eight cumulative hours in places where they can experience natural habitats, as free as possible from human influence. Aside from stipulations to encourage and ensure safety, the only other condition is that the time should be spent, to the extent possible, in solitude, free from interactions with the "built" world (including but not limited to smart phones). Students are encouraged to "pay attention to what is going on in the natural world around you," "take in nature with your senses," and "just be present." Students are also asked to log their outings in a personal journal and to provide brief reflections on their experiences.

One of the goals of the course, and a signature element of the *Ecology of Resilience* curriculum, is to foster a healthy "ecosystem" of knowledge, strategies, and practices, which enable participants to experience greater success with the challenges which frequently accompany the college experience and, arguably, life itself. An underlying principle of the model is that stress is universal and inevitable – it cannot be eliminated or avoided, but it can be managed. As discussed above, effectively managing stress involves both knowledge and appreciation (ie stress has a physiological basis rooted in the nervous system, and its role is adaptive in that it is the body's attempt to handle threats to our wellbeing).[55,56]

Outcomes for managing stress typically focus on thoughts and views (perceptions) of stress and the ability to bounce back from disruptions (resilience).[57–59] We hypothesized that students who studied the *Ecology of Resilience* curriculum through the Biology of Stress and Stress Management course would exhibit a decrease in Perceived Stress Scale (PSS)[60] scores and an increase in Brief Resilience Scale (BRS)[61] scores versus a control group of peers not enrolled in the class.

Methods

Participants

Across three 14-week academic semesters, a total of 157 traditional undergraduate students enrolled in CTI courses participated in the study. The experimental group consisted of 112 students (74 female, 38 male) enrolled in CTI 499 Biology of Stress and Stress Management class sections offered in the Spring 2022, Fall 2022, and Spring 2023 semesters, hereafter referred to as the "Nature" group. A control group consisted of a similar cohort of 45 students (25 female, 20 male) enrolled in other CTI courses focusing on unrelated topics (eg Technology and Society, Superheroes, and Northern Ireland) during the Spring 2022 and Fall 2022 semesters, hereafter referred to as the "Control" group. By virtue of being enrolled in a CTI course, all participants had completed a minimum of 60 credit hours of work and had junior or senior status.

Measures

To assess the proposed outcomes of a more favorable perception of stress and an increased sense of resilience after taking the course, the Perceived Stress Scale (PSS)[60] and the Brief Resilience Scale (BRS)[61] were chosen, respectively, and employed in a pretest/post-test design. The choice of these instruments is consistent with other studies assessing stress management and resilience.[62,63]

Developed in 1983 by Cohen et al, the PSS is a widespread tool for assessing subjects' feelings and perceptions about stress and includes 10 items assessing how often participants felt or thought a certain way over the last month on a 5-point Likert scale from 0 (Never) to 4 (Very Often).[60] Four of the 10 questions (4, 5, 7, and 8) are reverse scored. Items are designed to quantify the degree to which respondents find their lives "unpredictable, uncontrollable, and overloading," and the scale has been used in hundreds of studies and validated in many languages.[62,64]

Created in 2008 by Smith et al, the BRS is calculated using a mean of responses to six items about stressful events measured on a 5-point Likert scale from 1 (Strongly Disagree) to 5 (Strongly Agree). It is frequently used to assess attitudes and abilities regarding bouncing back and recovering from stress.[61,63]

These two instruments were chosen intentionally due to their prevalence in the literature and since the desired outcomes of the course and Ecology of Resilience curriculum include managing *stress* through developing *resilience*. Pretests were administered on the first day of class and post-tests on the last day of class, a span of approximately 15 wk for each semester the study took place. Participants signed an informed consent and were given the opportunity to opt out of the data collection process at any point. The project received prior approval by the University's Institutional Review Board and Human Subjects Committee (IRB-HSC; Application #S2022-01) in January 2022.

Analysis

Pre- and post-test PSS and BRS data were analyzed with a multilevel model approach, using the lme4 package (version 1.1-33) in R (version 4.2.2). Participant and Semester were treated as random factors with Type of Class (Nature or Control) and Test (Pretest or Post-test) as fixed factors. Perceived Stress Scale (PSS) and Brief Resilience Scale (BRS) were the outcome variables.

Results

Descriptive data

Table 1 shows means of the PSS and BRS for the Pretest and Post-test for the Control and Nature groups. These means reflected the predicted pattern.

Perceived Stress Scale (PSS)

The multilevel model for PSS showed an interaction between Test and Class, reflecting a significant decrease in perceived stress from pretest to post-test in the Nature class relative to the Control group (see Figure 1 and Table 2). For the Nature

Table 1. Pre- and post-test PSS and BRS descriptive data for Nature and Control groups ($n = 112$, $n = 45$, respectively).

		Mean		SD	
		Pretest	Post-test	Pretest	Post-test
PSS	Nature	19.26	17.94	6.26	5.73
	Control	19.40	20.16	6.22	6.20
BRS	Nature	3.23	3.49	0.67	0.67
	Control	3.29	3.30	0.77	0.79

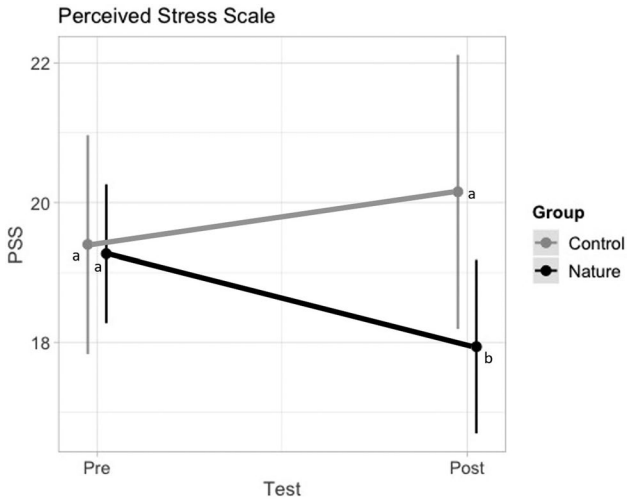

Figure 1. Pre- and post-test PSS means for Nature and Control groups ($n = 112$, $n = 45$, respectively). Points denoted with different letters represent a statistically significant difference at $p = 0.025$.

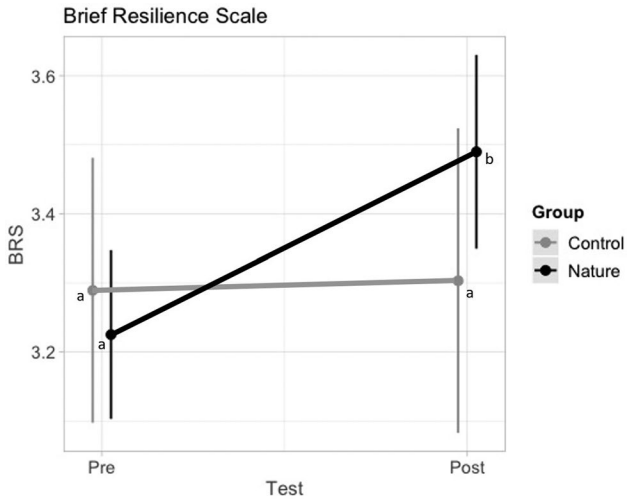

Figure 2. Pre- and post-test BRS means for Nature and Control groups ($n = 112$, $n = 45$, respectively). Points denoted with different letters represent a statistically significant difference at $p < 0.001$.

group, perceived stress was significantly lower for the post-test than the pretest ($b = -0.94$, $p = 0.025$, $n = 112$), whereas there was no significant change from pretest to post-test for the Control group ($b = 0.53$, $p = 0.23$, $n = 45$). Models including sex as a covariate did not exhibit significant differences in PSS for either group.

Brief Resilience Scale (BRS)

The multilevel model for BRS showed an interaction between Test and Class, reflecting an increase in resilience in the Nature class that was not present in the Control class (see Figure 2 and Table 2). Simple analyses of each type of class showed that there was a significant increase in the BRS for the Nature group ($b = 0.19$, $t = 5.21$, $p < 0.001$, $n = 112$) but no change in the Control group ($b = 0.01$, $t = 0.18$, $p = 0.85$, $n = 45$). Models including sex as a covariate did not exhibit significant differences in BRS for either group.

Table 2. Multilevel model for PSS and BRS – Fixed effects ($n = 157$).

		B	SE	95% CI lower	95% CI upper	*p* value	Effect size *D*
PSS	Intercept	19.78	0.8	18.22	21.34	<0.001	
	Test	0.53	0.6	−0.64	1.71	0.37	0.14
	Class	−1.18	0.94	−3.02	0.67	0.21	0.2
	Interaction	−1.48	0.71	−2.87	−0.081	0.040	0.33
BRS	Intercept	3.29	0.097	3.11	3.49	<0.001	
	Test	0.0098	0.053	−0.1	0.12	0.85	0.03
	Class	0.061	0.12	−0.17	0.29	0.60	0.09
	Interaction	0.18	0.066	0.048	0.31	0.008	0.43
For the simple effects							
	PSS Control	0.53	0.44	−0.33	1.4	0.23	0.36
	PSS Nature	−0.94	0.41	−1.76	−0.13	0.025	0.43
	BRS Control	0.009	0.052	−0.094	0.114	0.85	0.054
	BRS Nature	0.19	0.035	0.12	0.26	<0.001	0.99

Discussion

The purpose of this pilot study was to evaluate the merits of the nature-informed *Ecology of Resilience* curriculum for promoting stress management in college students via a new interdisciplinary course titled The Biology of Stress and Stress Management. Specifically, the goal of the curriculum was to decrease perceptions of stress and to increase characteristics of resilience measured with the Perceived Stress Scale (PSS) and Brief Resilience Scale (BRS), respectively. Statistically significant differences were observed in predicted directions on both measures for students completing the course compared to no differences in a control group. Compared to the control group, participation in the course had a small to moderate effect size and was comparable to interventions in other studies.[65,66]

Although direct causality can never be inferred, students in the experimental Nature group were exposed to content, practices, and mindsets regarding stress that participants in the Control group courses were not. For example, among other things, Nature group students were presented with the following tenets: 1) "Stress" cannot necessarily be avoided nor eliminated, but it can be understood, appreciated, and managed. 2) The human stress response is a typical, healthy, and adaptive response to perceived stressors. 3) Several aspects of contemporary living trigger the stress response even though these stressors are not life-threatening. 4) If not managed, these stressors can result in chronic activation of the stress response which has serious health and wellness implications. 5) A key for managing stress is developing resilience – the ability to handle and bounce back from stressors. 6) Natural ecosystems, which exbibit remarkable capacity to absorb and bounce back from disturbances when adequate resources and connections are present and maintained, are excellent models of resilience. 7) Spending time in nature is an empirically-supported practice for managing stress. and 8) Implementing various practices in the domains of self-care, self-knowledge, and community cultivate an ecology of resilience which can lead to better outcomes regarding stress.

We conclude that the course content, along with a heavy emphasis on the therapeutic benefits of spending time in natural settings, provided students in the Nature group resources and more realistic perspectives for changing their

perceptions about stress and resilience for the better which were reflected in PSS and BRS post-test results.

Additionally, the course has been well-received, with student interest increasing each successive semester it has been offered. Since inception, enrollment has increased from 30 to 74 to 134 each academic year with waiting lists required in all but the first semester. While quantitative data suggest that the course is impactful, anecdotal responses from students' personal journals and end-of-course evaluations provided validating feedback and reflected a connection with the natural world that perhaps had not been previously experienced, or that had been neglected. Interestingly, experiencing the rare but pleasant sensation of quiet was a common observation among students. Most reported coming back from nature outings more relaxed and calmer, and many expressed gratitude for the opportunity to discuss mental health in an informative and non-threatening atmosphere. Students also reported wanting to take the class after hearing about it from their friends (see Supplemental File).

In light of current concerns about student mental health, the results reported herein are encouraging. The demand for mental health services in college counseling centers often outpaces the capacity to deliver care, especially individualized therapy. Providing education in a group setting through an academic course has several advantages. Since one faculty or staff member can potentially have contact with many students on a regular basis, there is an economy of scale as well as depth and continuity of contact. Likewise, broaching the topic of stress and mental health in an academic setting among peers is often non-threatening and perhaps an easier first step than scheduling an appointment with a counseling center due to the aforementioned stigma around mental health care or fears about anonymity on a small college campus. Conversations about mental health in this type of environment normalize its discussion in ways that potentially cannot be replicated elsewhere.

Our findings align with similar efforts utilizing mindfulness, meditation, and psychoeducation for helping students manage the unique stressors associated with the college experience.[67–73] Also, the experiential, nature-based component of our curriculum should not be underestimated. The case for the therapeutic value of natural areas has strong support in the research literature.[19–37] Proximity to and utilization of these spaces, or at a minimum, places with elements of nature like city parks or managed greenspaces, is an existing and accessible (and often free) resource available to many college campuses. Opportunities to experience these types of assets could perhaps be prioritized in comprehensive student wellness plans. The Campus Rx Network provides excellent examples.[39] As stated previously, we believe our course is an innovative contribution to this philosophy.

While results from our early evaluation of the curriculum are encouraging, we would like to address several implementation and assessment matters in future iterations of the course. First, for two reasons, the Control group sample size was less than half that of the Nature group ($n = 45$ and $n = 112$, respectively). In order to minimize confounding factors, great care was taken to collect data from populations which were as similar as possible to each other. Data for the Nature group were drawn from Contemporary Issues (CTI) 499 The Biology of Stress and Stress Management, the course through which the Ecology of Resilience curriculum was delivered. Data for the Control group were collected from three other CTI courses (see above) running concurrently with CTI 499. Since CTI courses are typically taken as upper-level general education electives by students with junior or senior status, demographics for the two groups were more similar than if Control group data had been collected from other classes, eg those including freshmen and/or sophomores or classes unique to specific academic majors which may or may not induce more varying degrees of stress. Overall enrollment in these other CTI courses constituting the Control group was lower than for CTI 499. Also, soliciting cooperation from instructors of other CTI courses proved to be difficult with some opting to not administer surveys in their classes, thus the smaller sample size for the Control group. While the sample size for the Control group was lower than for the Experimental group, it was still adequate to demonstrate a significant difference in matched-pair data between the two groups. When additional assessment is conducted, more attention will be paid to increasing Control group sample size.

Due to the ethnic makeup of the University's student population and because this was a pilot study utilizing a limited sample size, data for race/ethnicity were not collected in order to ensure anonymity of participants. As stated in the Results, models including sex as a covariate did not exhibit significant differences in outcome variables for either group. However, because these demographic parameters are of interest for studies like this,[74–78] future investigations with larger sample sizes should explore patterns between and among these categories.

In addition, the Perceived Stress Scale and Brief Resilience Scale both address student perceptions and attitudes about stress. Despite spending instructional time on the physiological aspects and indicators of the human stress response (eg heart rate, blood pressure, heart rate variability, salivary cortisol, brain wave activity), no data were gathered for those variables. It might be useful in future assessment to see if content and skills learned in the course translate into measurable differences in these indicators, in addition to differences in perceptions of stress and resilience. Also, spending time in natural environments is actually stress-inducing for some people, and arguably non-therapeutic. It would be helpful to assess whether or not these individuals experience the same changes in resilience and perceived stress as their counterparts.

Higher resilience and more favorable perceptions of stress are measures which may likely be correlated with the all-important institutional metric of student retention, however, that remains to be demonstrated. If a positive effect on retention should be observed, institutions may have more interest in offering this type of content to students early in their academic careers, for example first-semester freshmen, rather than students with junior or senior status, most of which are on the cusp of graduating.

Also, one of the proposed benefits of teaching mental wellness in the context of an academic course includes

alleviating pressure on campus counseling centers. However, actual intake data were not recorded or was there any attempt to ascertain if the course increased or decreased need for services or lengths of waitlists on our campus. Finally, thus far the course has been taught by only one faculty member. Whether or not similar positive results are generalizable with other instructors should be explored.

Our *Ecology of Resilience* curriculum described here may serve as an effective early intervention, a pathway to more specialized care if needed, or, at a minimum, a type of "preventative maintenance" concerning mental wellness. We think it important to point out that instructors of any course dealing with the topic of mental health receive training in identifying and responding to signs and symptoms of mental health issues. Examples include but are not limited to Mental Health First Aid and Psychological First Aid.[79–81] Other trainings are readily available online or may be accessed through cooperation with college counseling centers. The instructor in this course collaborated with the University's counseling center at various points throughout the length of the study.

From our perspective, the integration of nature-based interventions is a helpful practice for empowering college students to manage stress. In the quest for effective and creative means of addressing student mental health demand on college campuses, curricula like the *Ecology of Resilience* presented within the contexts of for-credit academic courses as reported on here are viable options and exhibit value and promise.

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Conflict of interest disclosure

The authors have no conflicts of interest to report. The authors confirm that the research presented in this article met the ethical guidelines, including adherence to the legal requirements, of the United States of America and received approval from the Human Subjects Committee of the Anderson University Institutional Review Board (IRB-HSC #S2022-01).

Resources

An open educational resource (OER) textbook to accompany the course has been proposed, and we anticipate further involvement and collaboration with existing projects at other institutions. Meanwhile, a course outline, lecture guides, and a list of teaching materials are available by contacting the lead author.

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Ecology of Resilience – Supplemental File: Student Testimonials

▪ "This class has helped me understand the biological aspects of stress and the effects it has on the body. I have always thought of stress was just a feeling you have, and never really have learned about the physical aspects of it. I have also learned different ways to manage stress and develop stress resilience, such as meditation, dieting, exercise, forest bathing, sleep, and many other things."
▪ "I think the deep dive we took into resilience was the most beneficial because we know what self-care, self-awareness, and community are on a surface level, but seeing how we can apply that in our day-to-day lives with science to back it up makes it have a stronger backbone."
▪ "This was one of my favorite courses I've taken so far and I wish everyone could take this class because I feel like it could really benefit all people, no matter what your major or interests are."
▪ "I believe there is a drastic change in my ability to understand and manage my stress from the beginning of the course to today. When I first completed the surveys, my results disappointed and worried me as they demonstrated high levels of stress. I am still experiencing the same stressful experiences and situations that I was when I completed these inventories. However, as a result of this course, I feel as though I have the ability to recognize when I am in danger of affecting my health and act upon those feelings. I am able to recognize the signs and symptoms of stress in my body and allow myself breaks or time for reflection in order to create a balance. I have also been practicing time-management skills which has resulted in less task-induced stress. Finally, as a result of this course, I am able to recognize the significance of time in nature or the outdoors. I have always known that spending time in nature is beneficial, but I had not taken the time to truly experience these feelings. Now that I have, I truly appreciate this luxury, and I hope to take full advantage of it. I am grateful to have taken this course prior to my last year of college. This will be a very influential time for me in regards to starting a career and transitioning into a new lifestyle. I now feel equipped to step into what will be a difficult but rewarding journey."
▪ "I really enjoyed sitting outside and watching an area change from summer to fall to winter. I loved watching birds and sitting outside with the opportunity to just relax. I'm falling more in love with the beauty and grace of the natural world. I find myself just wanting to go outside and sit."
▪ "I needed someone to give me permission to go outside. Without this assignment, I would have continually talked myself out of taking breaks in order to practice piano or work more on homework. I am so thankful I was told to go outside. I wouldn't have discovered how much I needed it otherwise. Here's to more outside excursions, saunterings, and stillness. Here's to more awareness of the plants and animals around me – more of a knowledge of excitement for the sounds and sights of my home state. Here's to more courage and here's to more slowness – I needed both in order to encounter more of nature this semester . . . and I want more. This class was extremely formative for me, and I hope to carry it forward for my life."