

SCHOOL OF ENVIRONMENT AND NATURAL RESOURCES

# 2019 Campus Sustainability Survey: Results and Trends

A Report from the Environmental and Social Sustainability Lab (2020)



**THE OHIO STATE UNIVERSITY**

COLLEGE OF FOOD, AGRICULTURAL,  
AND ENVIRONMENTAL SCIENCES

In Collaboration with the  
Ohio State University  
Sustainability Institute

## **About the Environmental and Social Sustainability Lab**

The Environmental and Social Sustainability (ESS) Lab is a collaborative community of scholars working to build scientific understanding of environmental and social sustainability in an interdisciplinary context. Housed within the School of Environmental and Natural Resources within The College of Food, Agriculture, and Environmental Sciences, we are staffed by a core group of affiliated faculty members, students, and research staff representing a broad range of social science expertise. Our mission is to support a viable socio-ecological future through applied social science research, and to serve as a hub of sustainability research at Ohio State.

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# OHIO STATE SUSTAINABILITY GOALS

## Strategic Vision

Ohio State is a recognized leader in developing durable solutions to the pressing challenges of sustainability and in evolving a culture of sustainability through collaborative teaching, pioneering research, comprehensive outreach, and innovative operations, practices, and policies.

As progress is made toward realizing institutional sustainability aspirations, four overarching, foundational principles of the university must take hold to ensure that accountability and a culture of sustainability becomes pervasive throughout Ohio State's culture, practices and programs:

- Ensure a transformational approach by establishing a generational timeline to consider the impacts and trade-offs of decisions and economic, environmental, and social outcomes over many years and decades, instead of only the perspective of short-term economic returns.
- Utilize a council of internal and external stakeholders (i.e., students, staff, faculty, alumni/ae, companies, non-governmental organizations, agencies) to serve in an advisory capacity for the ongoing formulation, development, implementation, and assessment of goals, initiatives, and outcomes.
- Conduct research on our progress by developing and/or adapting research methodology to review and assess operational goals, and evaluate and publish the results with the aim of developing best practices and innovation for sustainability measurement.
- Incorporate relevant elements of sustainability into all college and support units' strategic plans, physical plans, and other university guiding documents.

## Teaching and Learning

1. Deliver a Curriculum that provides Ohio State students at all stages of instruction – from General Education to professional and technical programs – with opportunities to understand sustainability holistically, framed by the environment, science, technology, society, the economy, history, culture, and politics.
2. Address the Complexities of Sustainability through a variety of learning formats, strategies, and occasions.

## Research and Innovation

3. Reward Sustainability Scholarship, including the scholarship of engagement, by providing incentives for students, faculty and staff to make discoveries and stimulate creative efforts that promote and achieve sustainability.
4. Magnify Sustainability Scholarly Output and Impact to create new knowledge, solve real world problems, including for our own operations, and increase Ohio State's national/international reputation as a sustainability research leader.

## Outreach and Engagement

5. Foster Campus-to-Community, Students-to-Alumni Culture of sustainability-oriented practices and educational and research experiences that students and alumni transfer into local and global communities.
6. Catalyze Engagement, Ownership, and Buy-In to Sustainability via engaged and inclusive partnerships, on and off campus, that support the long-term economic, social and environmental welfare of the campus, surrounding neighborhoods and the global community.

## Resource Stewardship

7. Implement specific, "world-leading" university-wide operational goals to reduce resource consumption, neutralize carbon emissions and minimize waste, including:
  - a. Achieve carbon neutrality by 2050 per Presidents' Climate Leadership Commitment;
  - b. Reduce total campus building energy consumption by 25% by 2025;
  - c. Reduce potable water consumption by 5% per capita every five years, resetting baseline every five years;
  - d. Increase campus ecosystem services by 60%, by 2025;
  - e. Reduce carbon footprint of university fleet by 25% by 2025;
  - f. Achieve zero waste by 2025 by diverting 90% of waste away from landfills;
  - g. Increase production and purchase of locally and sustainably sourced food to 40% by 2025; and
  - h. Develop university-wide standards for targeted environmentally preferred products and fully implement preferable products and services by 2025.



# Executive Summary

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The Ohio State Campus Sustainability Survey represents a joint effort on the parts of numerous campus partners to measure current and longitudinal trends in undergraduate behaviors, beliefs, values, attitudes, and knowledge regarding sustainability at The Ohio State University. This report explores the results of that effort in 2019, through online survey responses from 3,276 Undergraduate students from the Columbus campus (out of 20,500 randomly selected students originally contacted; a response rate of approximately 16%). Please see the following sections for more details on our survey methods and student sample, as well as survey results in each of five major areas.

## *Engagement in sustainable behaviors:*

In total, undergraduate student engagement in sustainability-related behaviors such as carrying a reusable water bottle, turning off the lights in an empty room, printing on both sides of the paper, and utilizing public transportation remain quite high, suggesting progress towards OSU Sustainability goals #7a and #7b. However, opportunities to further promote campus sustainability goals continue to present themselves in emphasizing behaviors that are low cost, but that many students have not yet adopted, such as limiting purchases of new items and shifting purchases to second hand wherever possible, which could also inform OSU Sustainability goal #5 (For more on these results, please see Section 1).

**Recommendation:** When asked, students prioritized recycling and composting over other sustainability projects on campus, but 1 in 5 students mistakenly believed that recycling was more sustainable than reducing consumption. Likewise, roughly 1 in 5 students reported that they never or rarely purchased items second hand or limited purchases of new items, suggesting a gap that might be reduced by highlighting the 3 R's together: **Reduce, Reuse, Recycle**. By pairing these impactful behaviors in a familiar way with a high priority action, this simple messaging could improve sustainable behavior both on and off campus, in support of OSU Sustainability goals #5 and #6.

## *Sustainability knowledge:*

Similarly, when assessed through quiz-type questions **student knowledge of sustainability-related topics has increased by approximately 12% since 2014 (a continued upward trend from 2018)**. However, some misconceptions remain on

topics regarding the causes of pollution and environmental degradation (please see Section 2 for detail).

**Recommendation:** One-quarter of students incorrectly believed that keeping a cell phone charger plugged into an electrical outlet had greater environmental impact than producing a McDonald's quarter pounder or chicken sandwich. In addition, fewer than one-third of students correctly identified overfishing as a leading cause of depleted fish stocks. In terms of behavior, about two-thirds of students are currently omnivorous with no dietary restrictions, and most students reported often or always eating various animal products. Students seem to struggle to link diet with environmental impacts, so efforts to 1) correct misperceptions and strengthen that linkage while 2) providing opportunities to easily shift diets toward more sustainable consumption could improve sustainable behaviors among students overall. For example, communication efforts could highlight strong positive attitudes toward sustainability among OSU students (i.e., highlight the norm), while pointing out a common misperception and creating dissonance (e.g., that 2 in 3 students do not know that depleted fish stocks are primarily due to overfishing), and then provide a way to rectify these ideas moving forward (e.g., always choose sustainably-sourced fish, download the Seafood Watch app, etc.). Creating stronger cognitive linkages between diet and sustainability inside classrooms and at dining areas on campus would support OSU Sustainability goals #1 and #2, while providing greater opportunity for dietary shifts among students could support OSU Sustainability goals #7g and #7h

### ***Student awareness and support for campus initiatives:***

The 2019 survey contained several items developed in collaboration with the Sustainability Institute, the Office of Student Life, and OSU Facilities, Operations and Development. Together, these items provide insights about student prioritization of on-campus open spaces and sustainability initiatives. Additionally, we provide data related to sustainability curriculum development with the Sustainability Education and Learning Committee (see OSU Sustainability goal #1).

- A. **Open Space:** While over half of students indicated that there should be more open space on campus (60.5%), it is not clear if they would be willing to trade this with built spaces. Over half of students ranked natural habitat with public access as the highest or second highest priority (60.8%), and consistently ranked it higher than cultural/iconic areas or trails. See Section 4 for additional detail and findings. **Recommendation:** Students indicated that open spaces at OSU are a somewhat important aspect of their identity, would generally prefer more open space, and prioritized natural areas that could be accessed by the public. Most existing natural areas on campus are associated with water (e.g. the Olentangy River Trail, the Schiermeier Olentangy River Wetland Research Park, and the

Chadwick Arboretum), and all would inevitably benefit from better water quality (and would support OSU Sustainability goal #7d). Unfortunately, less than half of students knew that surface water runoff is the biggest contributor to water pollution. Public outreach efforts on campus to link common behaviors with their effects on the water quality in important natural areas on campus could benefit students, the community, and the resource (supporting OSU Sustainability goals #2, #5, and #6). Again, these efforts might start by highlighting the norm of positive sustainable attitudes among OSU students, point out the relevant misperception, and then suggest behaviors that both align with the norm of sustainability and correct the misperception.

- B. ***Sustainability Curriculum:*** Most respondents indicated that they had taken no classes related to sustainability or the environment at Ohio State (64.2%). On average, students agreed that employers are interested in students with sustainability-related knowledge and skills, and that they were aware and informed of opportunities to acquire such knowledge and skills. Likewise, there seems to be a small trend of increasing interest in sustainability courses since 2018. However, students generally disagreed with the statement, “I actively seek sustainability-related courses when enrolling in classes.” **Recommendation:** One approach to increasing interest and enrollment in sustainability-related courses might be to provide simple notations for courses that have officially integrated sustainability into their syllabi. The “Sustainability” theme that has been included in the new GE curriculum is also likely to result in an increase in the number of sustainability-related courses at OSU as well as an overall increase in enrollment in sustainability-related courses. See Section 5 for further detail and additional findings.

### ***Future plans:***

The ESS lab plans to continue using an annual survey and a panel of undergraduate students to measure changes in sustainability knowledge, attitudes, and values as well as engagement in sustainable behaviors. Such data is intended to help broadly inform and assess sustainability efforts taking place at Ohio State.



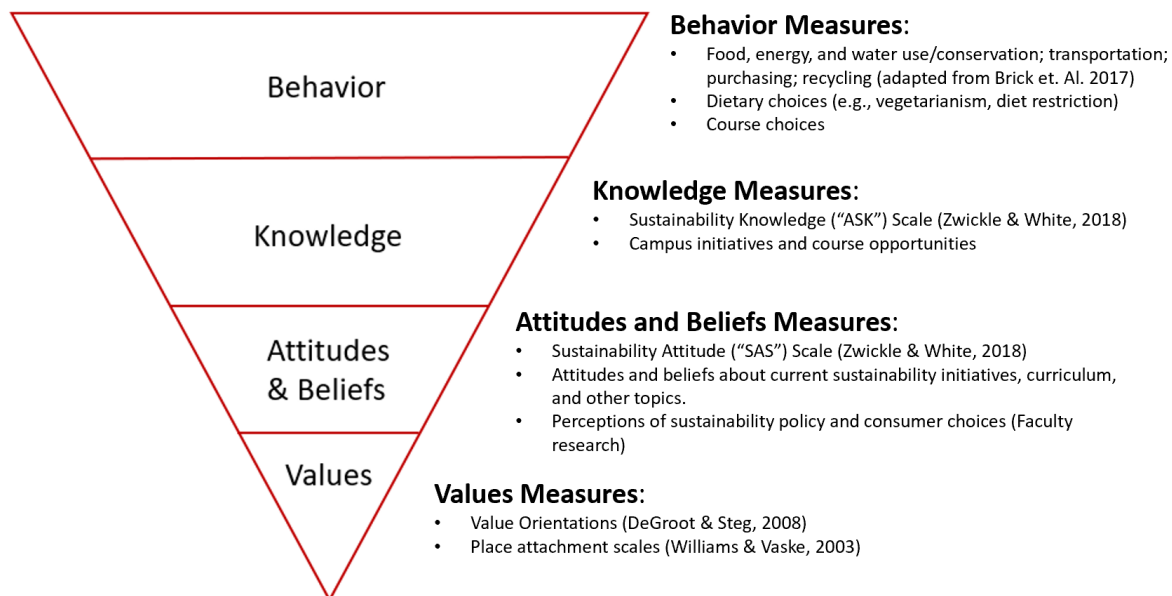
# Methodology and Design

The 2019 Campus Sustainability Survey was organized and administered by members of the Environmental and Social Sustainability (ESS) Lab in the School of Environment and Natural Resources, in collaboration with the Ohio State Sustainability Institute, Facilities Operations and Development, the Office of Student Life, the Center for the Study of Student Life, and Ohio State Energy Partners.

## *Survey Design:*

Items were based on established scales where possible and were designed to capture a full suite of sustainability-related constructs including values, attitudes, beliefs, knowledge, and behaviors. Figure 1 below provides a summary of this approach and the types of scales used. The figure takes the shape of an inverted pyramid to represent the idea that behaviors at the top of the pyramid are many and varied, while values at the bottom are few in number and foundational. If not otherwise noted, items were self-generated with input from ESS Faculty members and/or our campus partners. (For the citations noted in Figure 1 please see the “References” section at the end of the report).

**Figure 1. Cognitive hierarchy**





Overall, there were three types of survey items developed:

- 1) **Longitudinal items** (i.e. annually recurring): These items are intended to track changes in sustainability behaviors (adapted from Brick et.al. 2017), sustainability knowledge (“ASK” scale, Zwickle and Jones 2018), and sustainability attitudes (“SAS” scale, Zwickle and Jones 2018) over time. Some of these items can be compared to survey results from 2010 - 2014.
- 2) **One-time items**: These items address topics that are of interest to our campus partners, such as support for current and future sustainability initiatives and development of a sustainability curriculum.
- 3) **Faculty research items**: In 2019, faculty research items explored consumer behavior and wisdom (Drs. Brooks and Herziger of SENR), and research that assessed student perceptions of food, energy, agriculture and water policy (Dr. Jeff Bielicki of the College of Engineering). (Faculty research results will be developed into scholarly publications and are not included in this report). There is an open call for faculty research items each year. OSU faculty have the opportunity to request a limited number of items to be included in the survey and these requests are reviewed by the ESSL leadership committee.

### ***Survey Implementation:***

In order to maintain a panel and assess how individuals have changed over time, our sampling frame for 2019 included all students that responded to the 2018 survey and were still enrolled at OSU in 2019 (N = 2,554). These 2018 respondents were separated by rank, and each total was subtracted from 5,000 to determine the number of new students randomly sampled from each rank for the 2019 effort. As was done in 2018, we oversampled 5,500 first year students to account for sample attrition over time. In October of 2019, survey invitations were emailed to the full sample of 20,500 non-transfer undergraduate students from OSU’s Columbus campus via Qualtrics. In addition to an invitation, after one week, participants were emailed a reminder, and one week later they received a third and final reminder.

***Table 1. Sample sizes by rank and response N***

Rank	Respondents from 2018	New contacts 2019	Overall Respondents 2019	Recontacted Respondents 2019
First year	0	5,500	1,040	0
Second year	1,214	3,786	756	173
Third year	695	4,305	714	238
Fourth year	645	4,355	648	322
Total	2,554	17,946	3,276	733

Of the 20,500 students contacted, 3,276 started the full survey and 2,636 completed it (13.0% completion rate). The final sample size used for this report (i.e. students who began the survey) was 3,276 students, for a final response rate of approximately 16%. Excluding outliers<sup>1</sup>, the average completion time for the full survey was approximately 21 minutes (with a mode of 15 minutes).

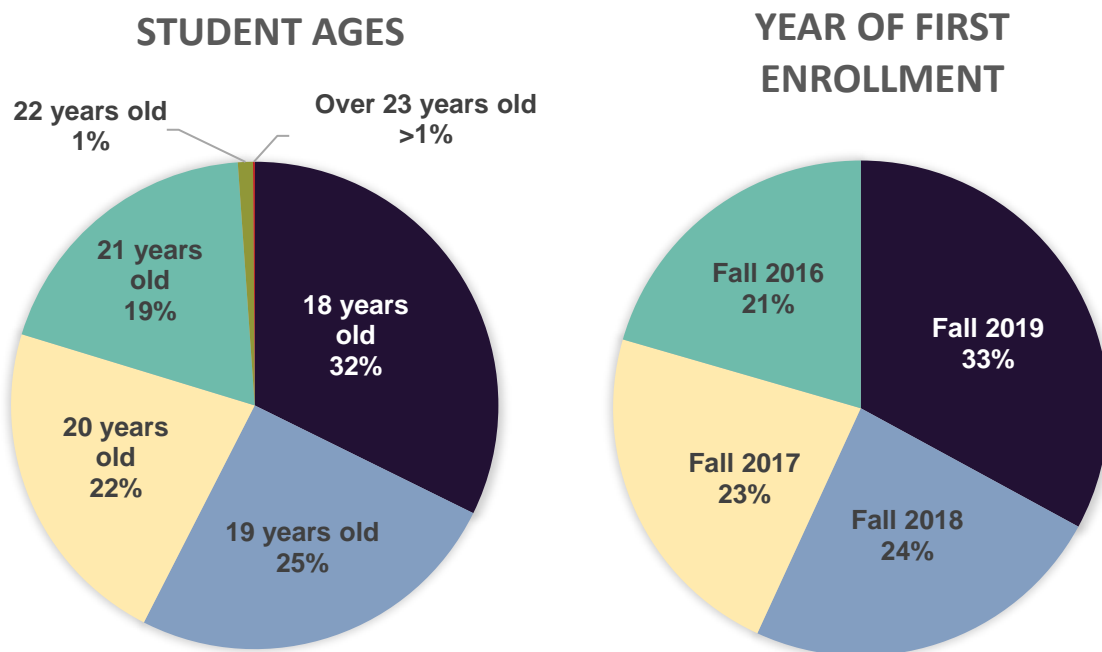
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<sup>1</sup> Outliers were identified using the box and whisker plot function in SPSS.

# Sample Characteristics

Our sample consisted of 3,276 undergraduate students who began the survey. Where appropriate, we provide the [Fifteenth Day Enrollment](#) numbers for Autumn 2019. Respondents were more female than male (67.3% female; AU19: 51% female), with an average age of 19 years old (SD = 1.16). By design, participants were skewed towards first-year students at Ohio State: 1,040 (32.9%; AU19: 14.2%) were first-year freshmen, 756 (23.9%; AU19: 21.9%) were second years, 714 (22.6%; AU19: 23.3%) were third-years, and 648 (20.5%; AU19: 40.3%) were in their fourth year since first enrolling. Additionally, the average (non-zero) GPA of our participants was a 3.44 (SD = 0.51).

**Figure 2. Distribution of respondent age and year of first enrollment.**



In terms of race and ethnicity, the majority of students in our sample identified as white (71.0%; AU19: 65.5%), with a minority of students identifying themselves as Asian (8.0%; AU19: 7.7%), Hispanic (4.7%; AU19: 4.8%), Black or African American (3.0%; AU19: 6.7%), Native Hawaiian or Pacific Islander (0.1%; AU19: 0.1%), or two or more races (4.2%; AU19: 3.9%). In addition, 3.0% of our sample were international students studying at Ohio State (AU19: 8.4%).

In terms of living situation and financial independence, our participants most commonly live in student residence halls (52%), although a substantial minority live in a house or

apartment with other students (35%), and a minority live on their own (6.9%) or with family (5.1%). Students reported that, on average, 41.4% of their living expenses came from personal earnings or savings (with a standard deviation of 32.4%), meaning the average student in our sample had roughly 59% of their living expenses financed by others.

In terms of where students grew up and their political affiliations, the majority of our sample report growing up in a suburban setting (65.8%), 11.9% in an urban setting, 10.4% in a small town, and 8.3% in a rural or agricultural environment. In addition, 48.3% described themselves as Democrats, 14.5% as Republicans, 30.3% as independents, 3.9% as Libertarians, and 3.1% as other political affiliations.

Lastly, in terms of academic programs and exposure to sustainability coursework, students most commonly reported that they had taken no classes related to sustainability or the environment at Ohio State (64.2%), while 27.8% reported taking just one or two classes; only 4.4% of our sample had taken three or more such classes (see Figure 11 in Section 5. Please see Table 2 for a breakdown of programs of study (in major categories).

**We do not associate these demographic variables with values, knowledge, or behavior in this report, and it remains an open opportunity for interested undergraduate or graduate students to ask questions and conduct analyses. We welcome and encourage student inquiries, which can be sent to [essl@osu.edu](mailto:essl@osu.edu).**

*Table 2. Response by program of study*

Program	Percent of respondents	Enrollment AU19
Arts and Sciences	37.4	37.5
Engineering	19.9	16.9
Business	13.0	15.2
Education and Human Ecology	5.1	6.6
Exploration Program (no declared major)	3.6	4.9
Health and Rehabilitation Sciences	4.8	4.2
Agriculture	4.0	3.3
Environment and Natural Resources	3.6	1.7
Nursing, Dental, and Medical	2.3	2.6
Pharmacy	1.5	1.0
Public Health	1.3	0.7
Architecture	1.3	1.2
John Glenn Public Affairs	1.0	0.7
Social Work	0.9	0.9
Undergraduate Non-Degree	0.03	n/a
Total N	3,158	46,818



# Section 1: Sustainable Behaviors

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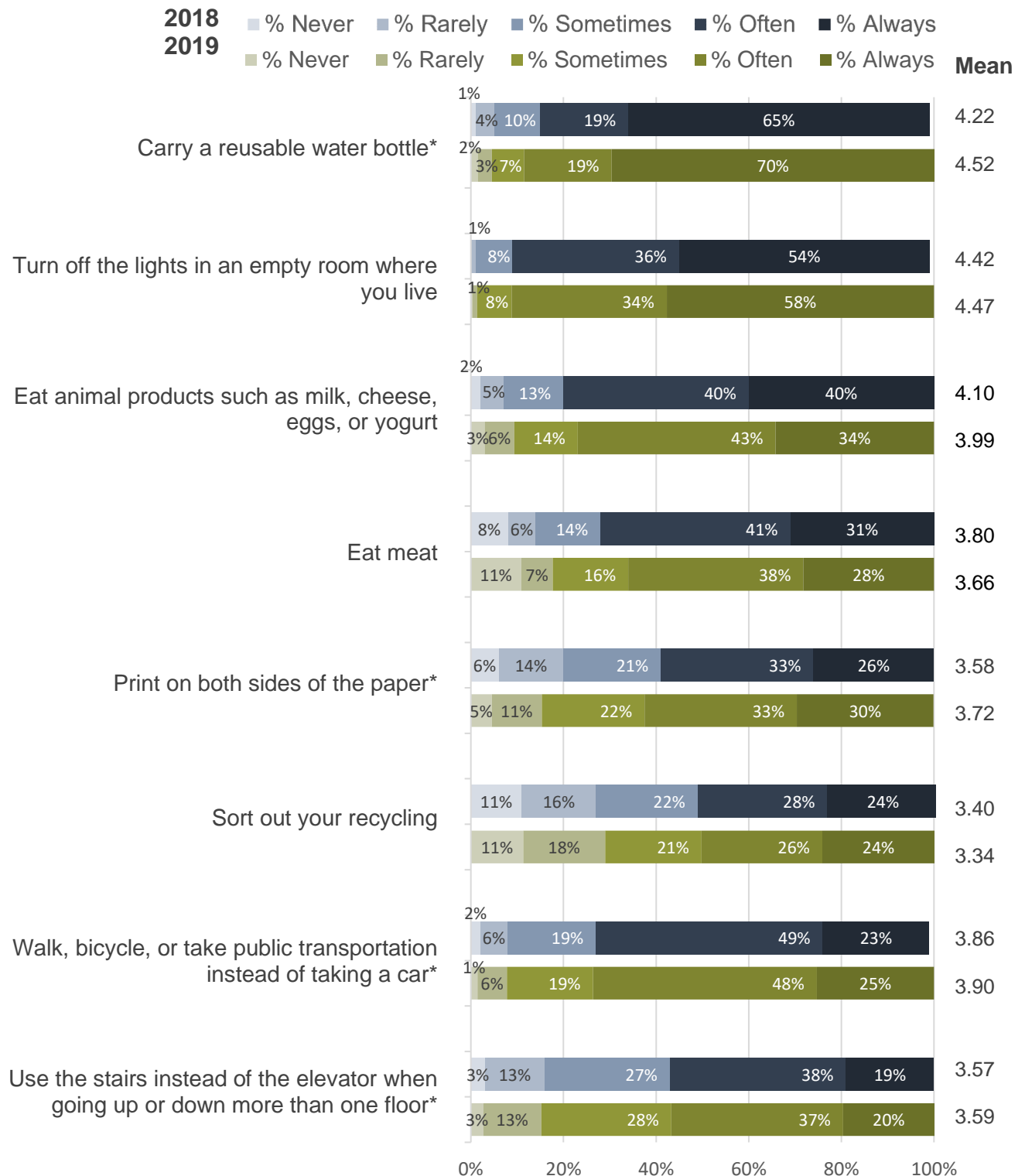
Replicating the survey from 2018, we again used the first section of the 2019 survey to ask students about their engagement in 15 pro-environmental and sustainability-related behaviors, including those that take place on and off-campus. Students were asked how often they engaged in these behaviors on a 1 – 5 “never” to “always” scale. Some of the behaviors were adapted from Brick et.al. (2017), and others were based on past surveys or were self-generated.

Similar to 2018, we find that in 2019, some behaviors are quite common among undergraduate students at Ohio State (Figure 3.1 and 3.2). For example, more than half of students say they “often” or “always” carry a reusable water bottle ( $M = 4.52$   $SD = 0.86$ ), turn off the lights in an empty room ( $M = 4.47$ ;  $SD = 0.71$ ), print on both sides of the paper ( $M = 3.72$ ,  $SD = 1.13$ ), or walk, bicycle, or utilize public transportation instead of a car ( $M = 3.90$ ,  $SD = 0.90$ ). Meanwhile, behaviors such purchasing second-hand items instead of purchasing new items ( $M = 3.10$ ,  $SD = 0.93$ ) and limiting consumption of new items (e.g. electronics, clothes) ( $M = 3.25$ ,  $SD = 0.96$ ) were less frequent. Some observations from these patterns is that, understandably, **easier behaviors performed on campus are more common than more effortful ones**. In addition, several behaviors that are adopted less frequently by students are ones over which they may have limited control, such as limiting HVAC use ( $M = 3.30$ ,  $SD = 1.01$ ) and eating organic food on campus ( $M = 2.83$ ,  $SD = 0.95$ ). However, there remain several **low-cost and relatively easy behaviors that may merit further emphasis** to promote campus sustainability goals. Namely, having students conserve water ( $M = 3.20$ ,  $SD = 1.03$ ), and turn personal electronics off or into low-power mode when not in use ( $M = 3.28$ ,  $SD = 1.20$ ).

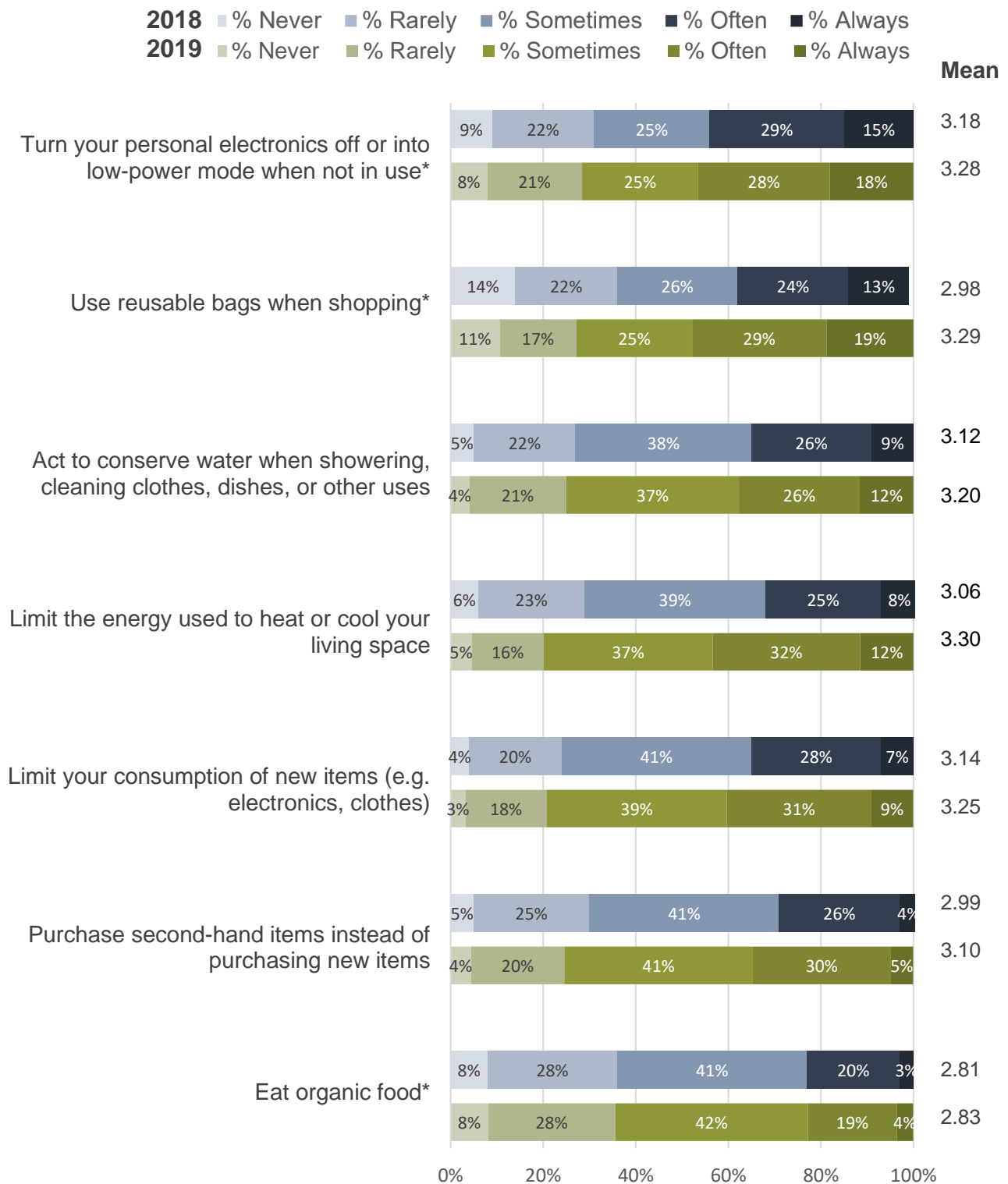
New for 2019, we asked students about their dietary preferences and restrictions. Around a third of students (36.7%,  $N = 1,155$ ) have changed their diet in the past five years, and of those who have changed their diet within the past five years, roughly two-thirds (68.6%) are moving toward more restrictions in their consumption of animal products. The majority of students are omnivorous with no restrictions (67.9%,  $N = 2,135$ ), one in five are semi-vegetarian or selective in their protein choices (21.4%), while some students are vegetarian or vegan (10.7%,  $N = 338$ ). In a previous iteration of the campus survey in fall of 2012, students responded that when given the opportunity, they chose a vegetarian meal 38.2% of the time ( $N = 615$ ). **Although most students reported eating meat and dairy products “always” or “often”, the overall findings on dietary preferences suggest that there may be the potential for more sustainable dietary changes, particularly in the form of occasional meatless meals.**

We again estimated changes in sustainability behaviors by comparing a sub-set of seven items that were included in the 2014, 2018, and 2019 versions of the survey (these items are starred in the chart that follows). While not perfect comparisons due to scale changes, if the 100-point engagement scale used in 2014 ("what percent of the time you engage in the behavior") was converted to a 5-point "never" to "always" scale, the average score from 2014 would be 2.86 (SD = 0.83). Compared the average of 3.67 (SD = 0.50) and 3.76 (SD = 0.50) in 2018 and 2019, respectively, this result represents **almost a full point increase between 2014 and 2019, and a slight increase from 2018 to 2019**. Small increases in frequency of behaviors from 2018 to 2019 were largely driven by increases in carrying a reusable waterbottle, using reusable bags, and limiting energy use for HVAC (Figures 3.1 and 3.2). Continued longitudinal assessment using identical measures will more precisely determine if this score is increasing over time, and if so, by how much per year.

**Figure 3.1. Sustainable behaviors: “Below is a list of behaviors you may or may not do. Please indicate how often you do these behaviors.” (N = 3,141 to 3,148)**



**Figure 3.2. Sustainable behaviors: “Below is a list of behaviors you may or may not do. Please indicate how often you do these behaviors.” (N = 3,141 to 3,148)**



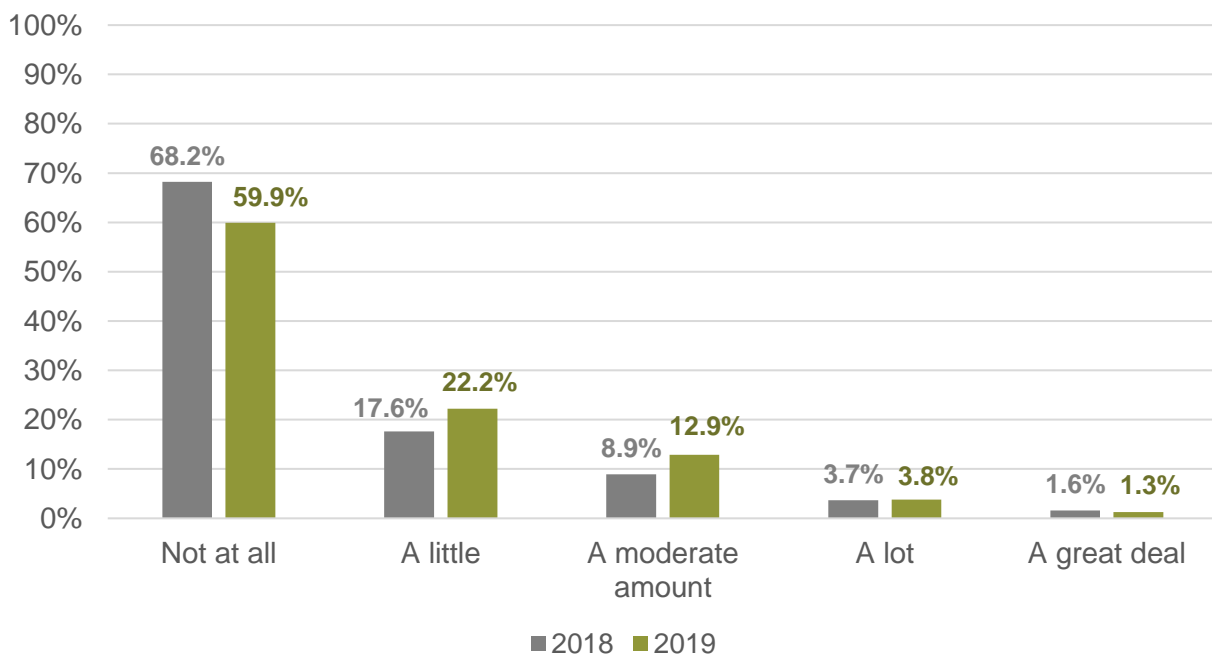


# Section 2: Attitudes Towards Campus Initiatives

In addition to the longitudinal scales, the survey also included items of interest to our collaborators in Student Life, Ohio State Energy Partners, and Facilities Operations and Development to gauge support for current or possible sustainability initiatives at Ohio State. These items were largely self-generated, and we will review them section-by-section in the following pages.

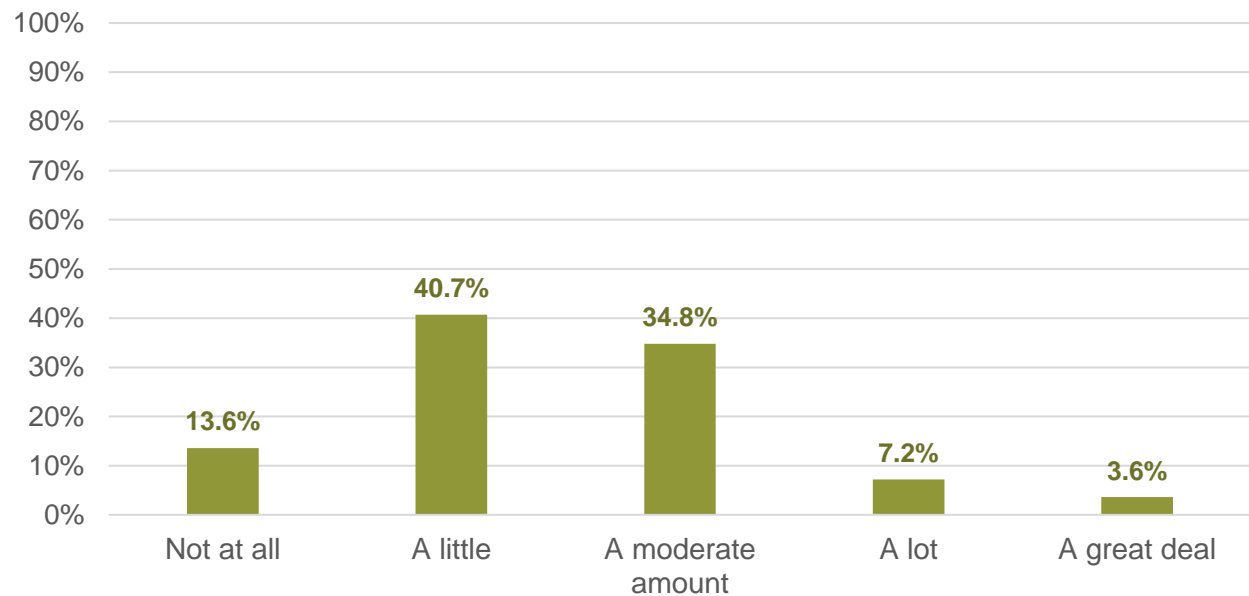
To begin, students were asked: “When deciding to come to Ohio State, were you influenced by the university's sustainability programming?” See graph below for a breakdown of responses on a 1 – 5 scale of “not at all” to “a great deal”. **Response scores to this question were again generally quite low**, with an average of 1.64 (SD = 0.93, N = 1,355, Figure 4). This remains **an area for improvement**: as Ohio State continues to build on its reputation for being a sustainable and innovative campus, these responses may become higher in the future.

**Figure 4. Influence of sustainability programming on student choice to attend OSU in 2018 and 2019.**



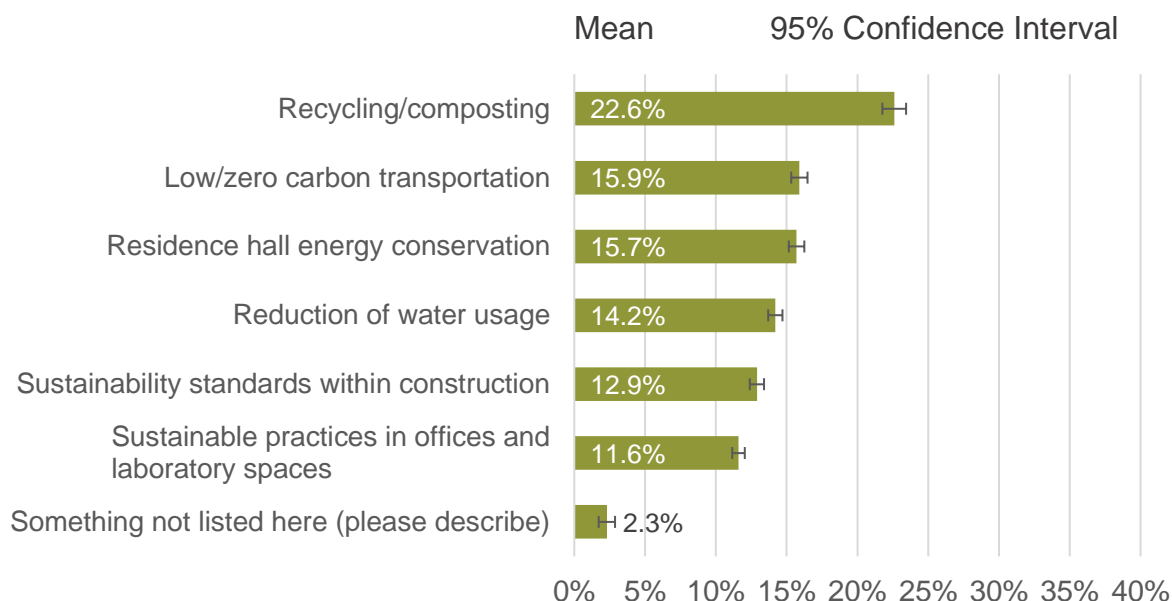
Then, students were asked about their knowledge of various sustainability initiatives on campus (e.g., Low Emission or Fuel-Efficient Vehicle Parking, Zero-Waste/recycling) on a 1 – 5 scale of “not at all” to “a great deal”. Students averaged between a little and a moderate amount of knowlegdge, with an average of 2.46, just below the midpoint (SD = 0.94, N = 1,356; Figure 5). These initiatives were not assessed separately, so we are unable to determine which one may be driving perceptions, but it is possible to assess initiatives at a more refined scale in future iterations of the survey. This could help with future programming and outreach efforts.

**Figure 5. Self-assessed student knowledge of sustainability initiatives on campus.**



Students were also asked how they would allocate resources to various sustainability initiatives on campus, divided among different project areas so that the total equals 100% (N = 1,351 to 1,371; Figure 6). Overall, students prioritized recycling/composting with an average of 22.6%, followed by low/zero carbon transportation (M = 15.9%, SD = 10.6), and residence hall energy conservation (M = 15.7%, SD = 10.2).

**Figure 6. Allocation of resources to sustainability initiatives on campus**



## Open Space on Campus

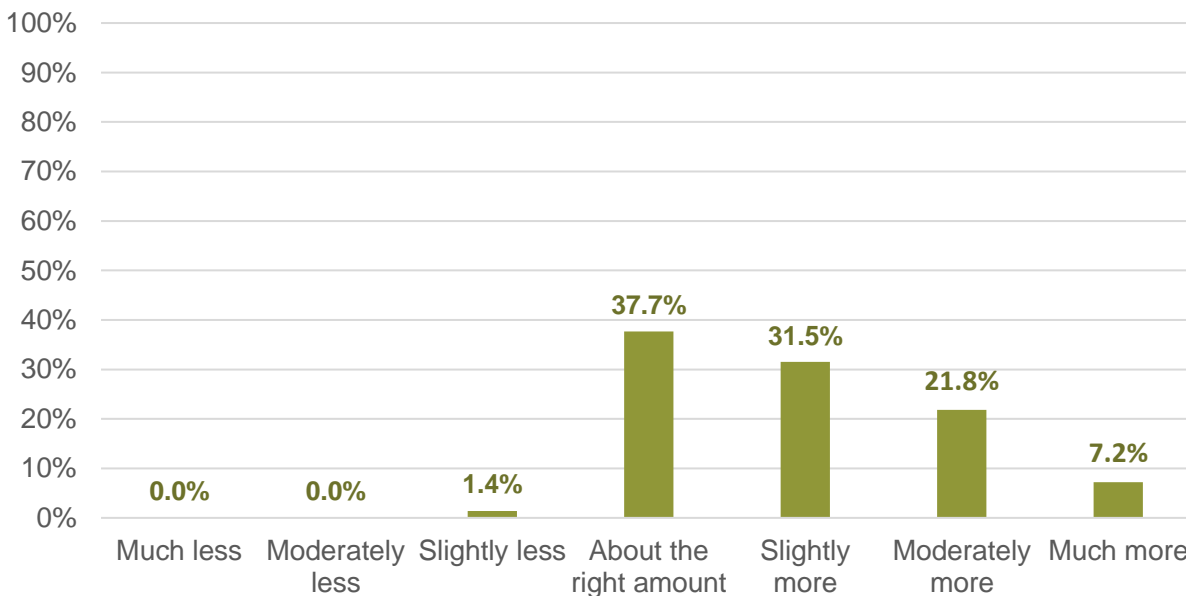
In order to address questions raised by OSU's interdisciplinary Ecosystem Services Panel, we asked several questions related to 1) how students value open spaces on campus, 2) whether they believe that open spaces should increase, decrease, or remain the same on campus, and 3) what types of open spaces students value on campus.

To address question 1, we modified an existing place attachment scale (Williams & Vaske, 2003) that assesses the degree to which a place is integral to a person's identity (6 items; e.g., "I feel OSU's open spaces are a part of me."), and the degree to which a person is dependent on a specific place to do what they what they most like to do in that type of space (6 items; e.g. "OSU's open spaces are the best place for what I like to do on campus.") on a scale of 1 – 7 ("strongly disagree" to "strongly agree"). Reliability for each set of items was acceptable (Cronbach's alpha identity = 0.94; Cronbach's alpha dependent = 0.84), so items from each set were averaged to create two scores for valuing OSU's open spaces: one as an integral part of student's identities, and one as valued places on campus. While students averaged above the midpoint for place

identity ( $M = 4.57$ ,  $SD = 1.28$ ,  $N = 1,323$ ), their average score for place dependency was closer to the midpoint of the scale ( $M = 4.17$ ,  $SD = 1.09$ ,  $N = 1,321$ ), **suggesting that while students may see open spaces as somewhat integral to their identity at OSU, they may not be as dependent on these spaces to do the things they like to do outdoors in Columbus.**

To address question 2, we asked students on a scale of 1 – 7 (“much less” to “much more”) if they felt there is about the right amount of open space on OSU’s campus, or if there should be less or more ( $N = 1,328$ ; Figure 7). Just over one-third of students felt that there is about the right amount of open space (37.7%), while **over half of students indicated that there should be more open space on campus (60.5%), though it is not clear if they would be willing to trade this with specific built spaces.** Future iterations of the survey could more directly explore students’ perceptions of the tradeoffs between increasing open space on campus and limiting built infrastructure, as well as additional important tradeoffs that are of interest to campus partners.

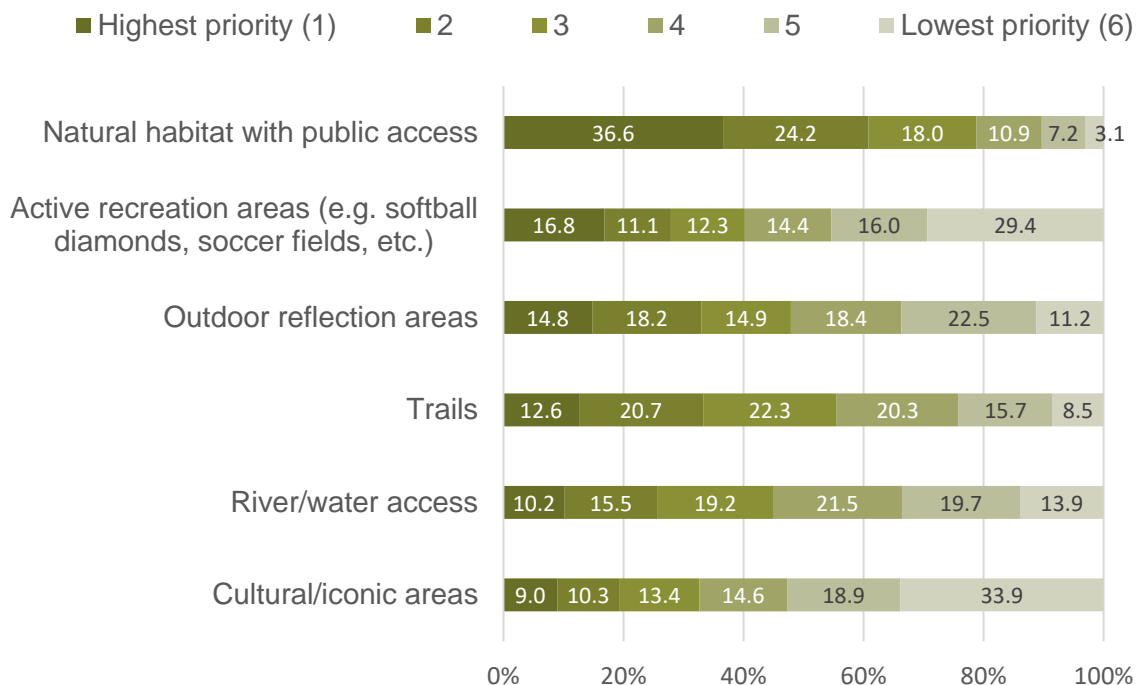
**Figure 7. Student perceptions of the amount of open space on campus.**





To answer question 3, students were asked about how they would prioritize open spaces on campus, ranking each type on a scale of 1 – 6 from “highest priority” (1) to “lowest priority” (6) (N = 1,278). The question gave examples of open spaces (e.g. the Oval, Mirror Lake, recreation areas, or natural areas near the Olentangy River). **Over half of students ranked natural habitat with public access as the highest or second highest priority (60.8%; Figure 8).**

*Figure 8. Percent of students ranking campus open spaces from highest priority (1) to lowest priority (6).*

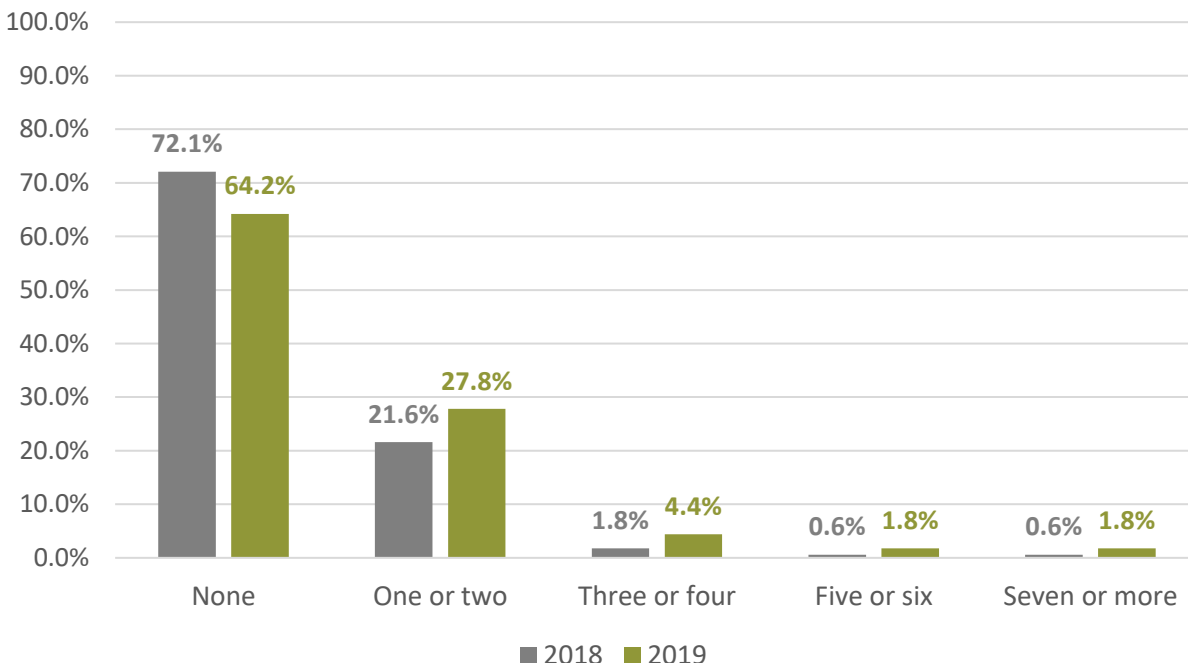


# Section 3: Sustainability Curriculum Development

The survey also included items designed to inform sustainability curriculum development at Ohio State. These items included having students rate their interest in different kinds of sustainability courses and their current and desired involvement in sustainability-related learning opportunities. These items were largely self-generated, and we will review them section-by-section in the next pages.

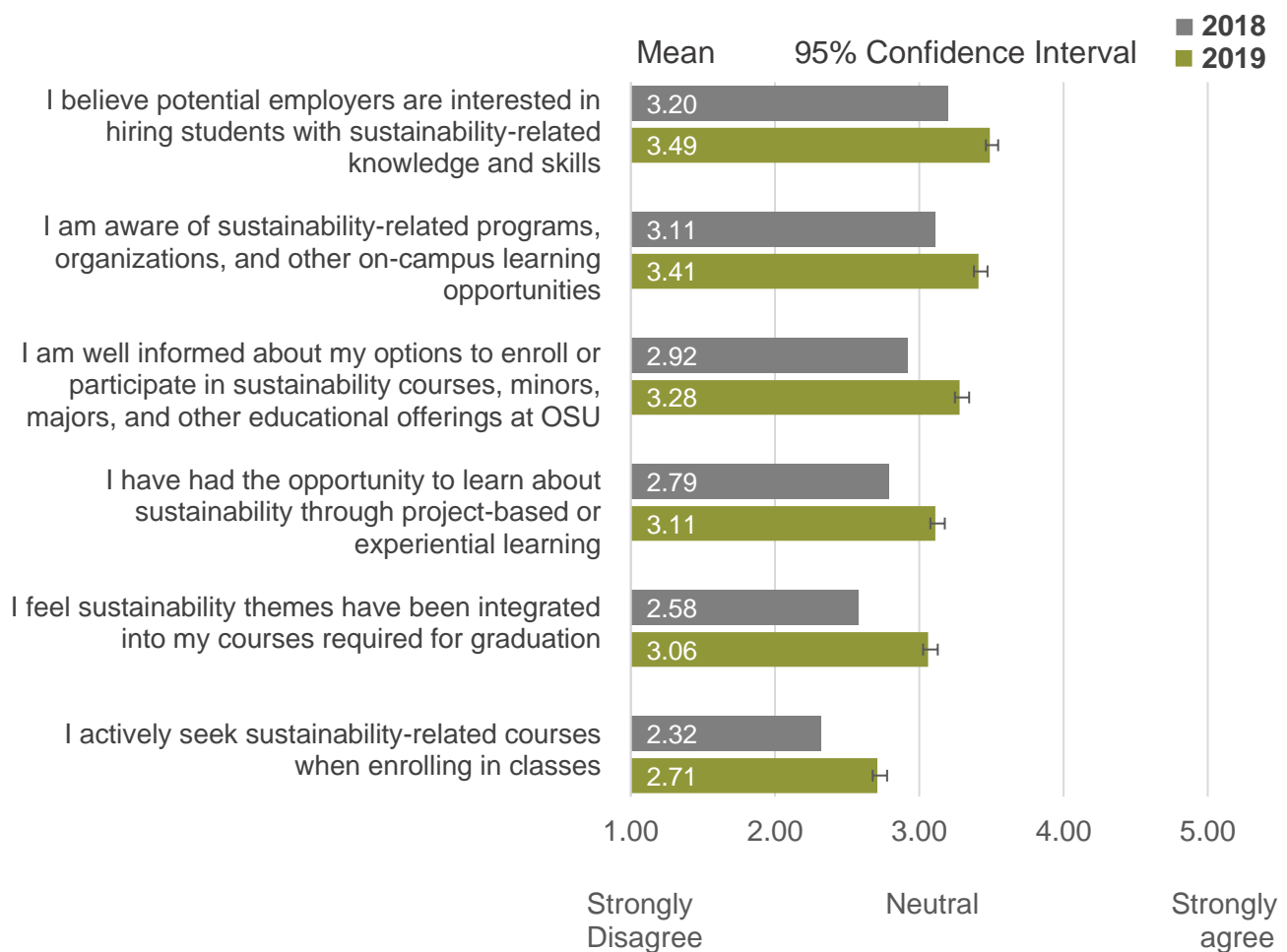
To begin, students were asked: “How many courses have you taken with a focus on sustainability at OSU?” (N = 2,609; Figure 9). Similar to 2018, the most common responses to this question in 2019 was “None” (64.2%; 2018 = 72.1%) or “One or two” courses (27.8%; 2018 = 21.6%). Of the students that answered this question in both 2018 and 2019 (N = 581), half had taken no sustainability courses in 2018, and reported the same in 2019, while 21% reported none in 2018, but reported having taken one or two in 2019.

**Figure 9. Number of courses taken with a focus on sustainability at OSU.**



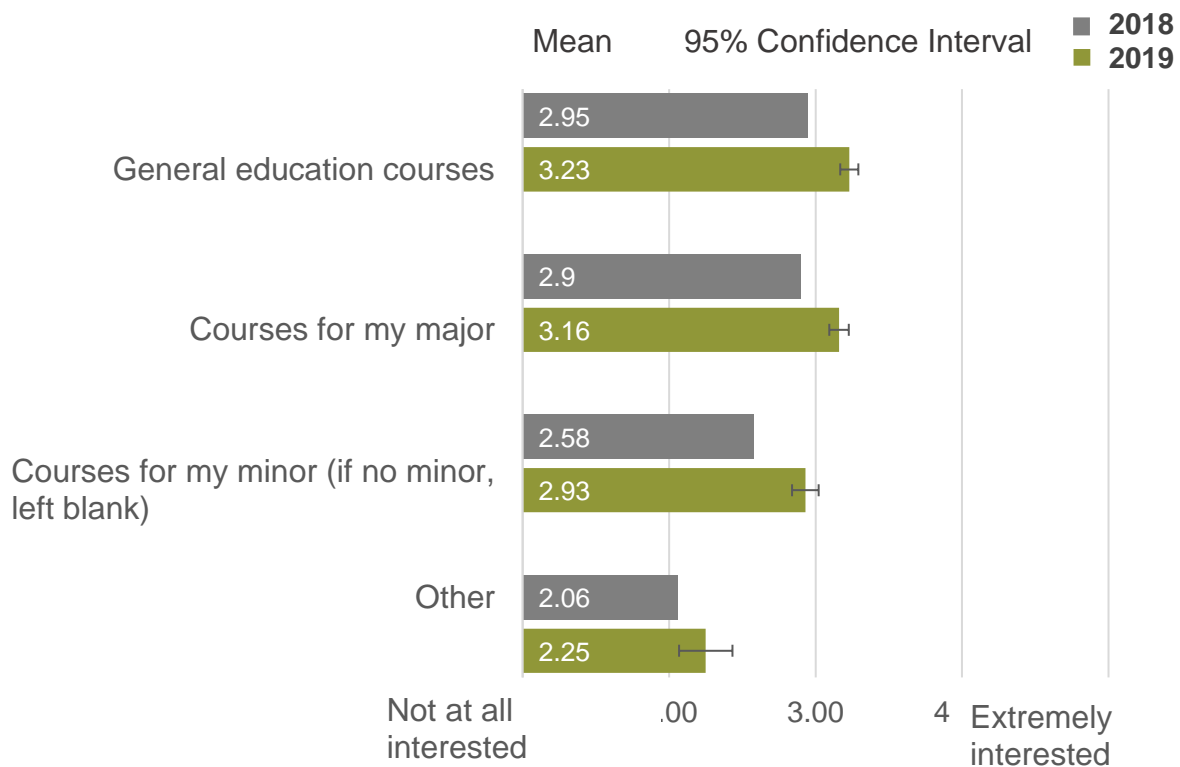
Students were then asked to rate their agreement with six different items related to sustainability education on a 1 – 5 “strongly disagree” to “strongly agree” scale (N = 1,428). See Figure 10 for average scores per item (including means, within bars, and standard deviations). Some notable trends in this data are how highly students agree that sustainability-related knowledge and skills are valued by potential employers, as well as their awareness of sustainability-related opportunities on campus. However, they generally do not actively seek sustainability-related courses to enroll in. There seems to be a generally positive trend towards awareness of sustainability on campus and seeking of sustainability-related courses from 2018 to 2019.

**Figure 10. Agreement with statements about beliefs and actions related to sustainability education.**

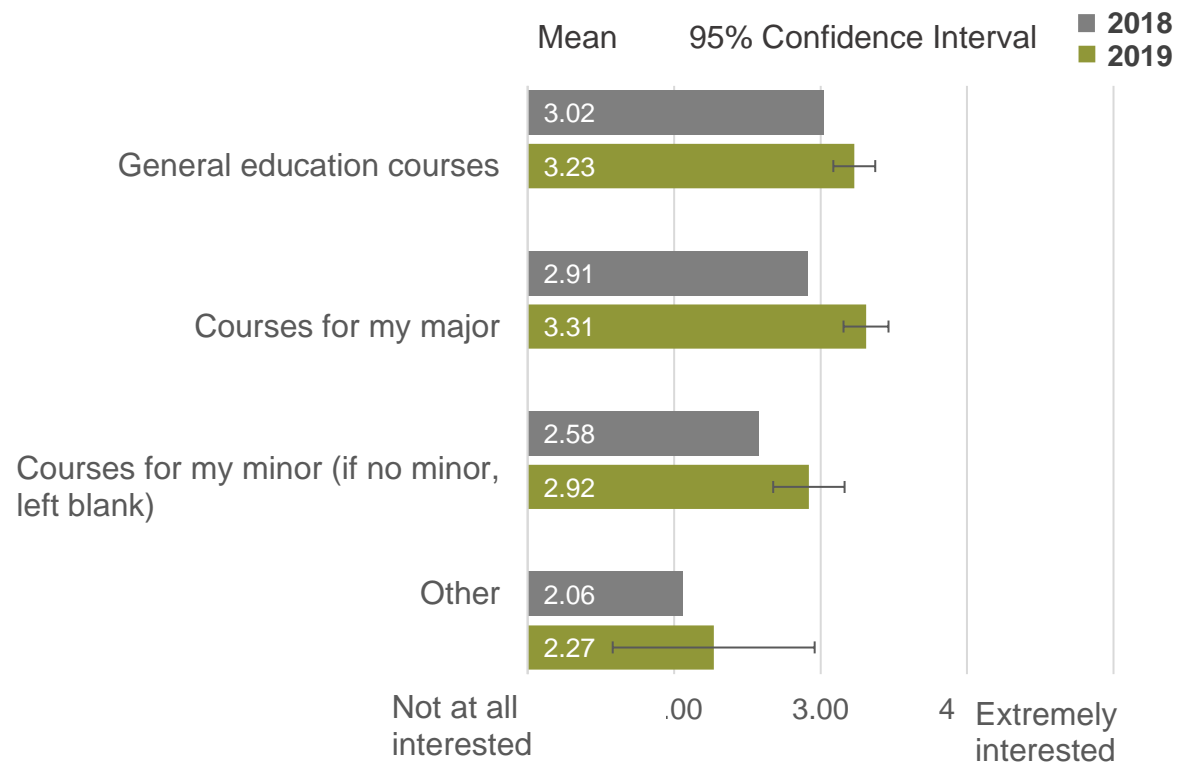


Next, students were asked to rate their interest with four different kinds of sustainability courses or content at Ohio State on a 1 – 5 “not at all interested” to “extremely interested” scale (N = 1,405 – 1,409). See Figure 11.1 below for average scores per item (including means – within bars, and standard deviations) and Figure 11.2 for within student changes. What can be observed in this data is that there seems to be a moderate amount of interest for general education courses and major-based courses. There does seem to be a small trend of increasing interest in sustainability courses since 2018.

**Figure 11.1. Average student interest in sustainability courses at OSU**

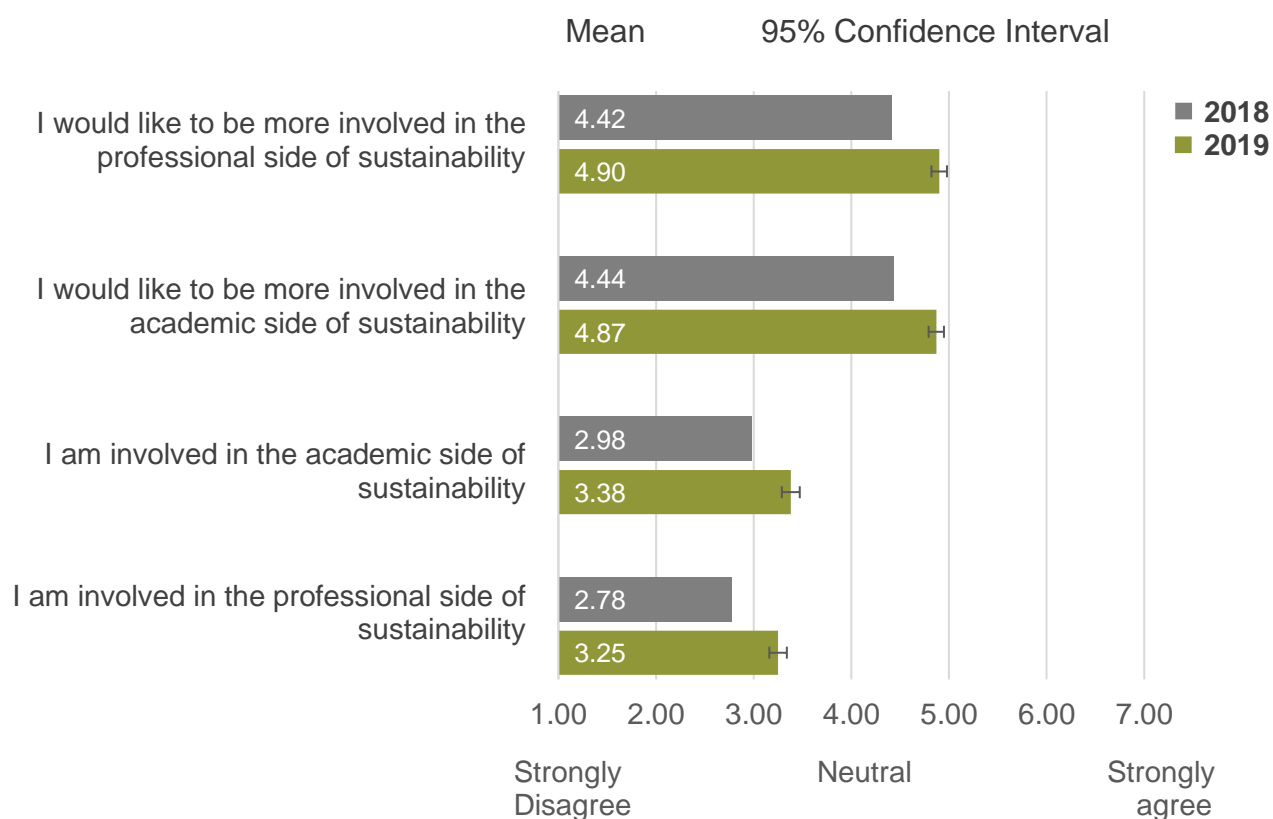


**Figure 11.2. Average student interest in sustainability courses at OSU (responses from students who took the survey in 2018 and 2019)**



Additionally, students indicated their agreement with four items related to their amount of current and desired involvement in the academic (i.e. through taking sustainability courses and pursuing sustainability-related research opportunities) and professional sides of sustainability (i.e. pursuing sustainability-related internships, volunteer opportunities, and student organization involvement or leadership) on a 7-point scale of “strongly disagree” to “strongly agree” (N = 1,410). See Figure 12 for average scores per item (including means within bars, and standard deviations):

**Figure 12. Current and desired involvement in academic and professional aspects of sustainability.**

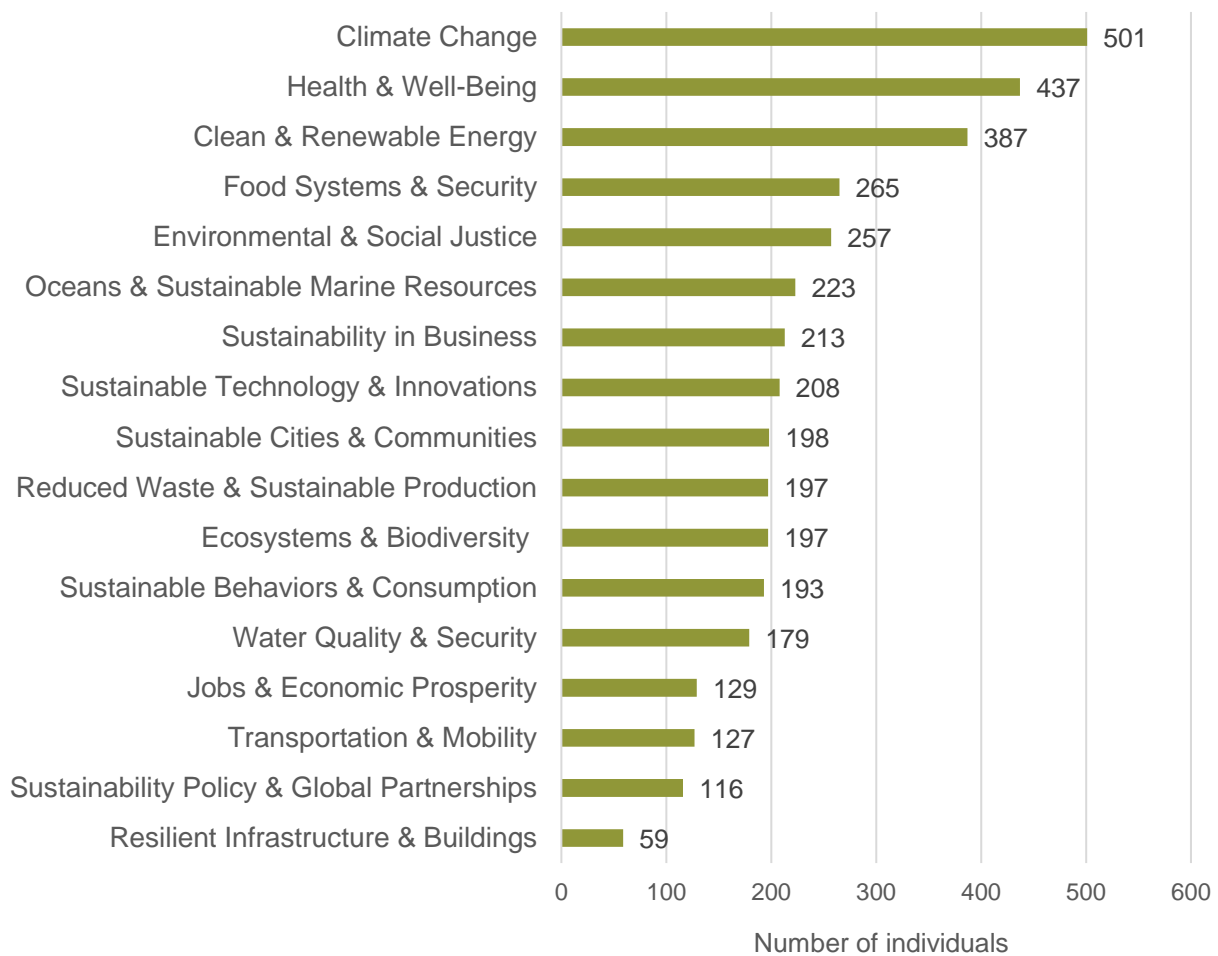


On average, students seem to particularly agree with the statement that they would like to become more involved in the professional side of sustainability, and were equally as interested in becoming involved in the academic and research side of sustainability. Meanwhile, the majority of students disagreed that they were currently involved in academic or personally-related sustainability opportunities, pointing to **a potential gap and opportunity area: providing more numerous and easily available academic and professional opportunities for students related to sustainability at Ohio State.**



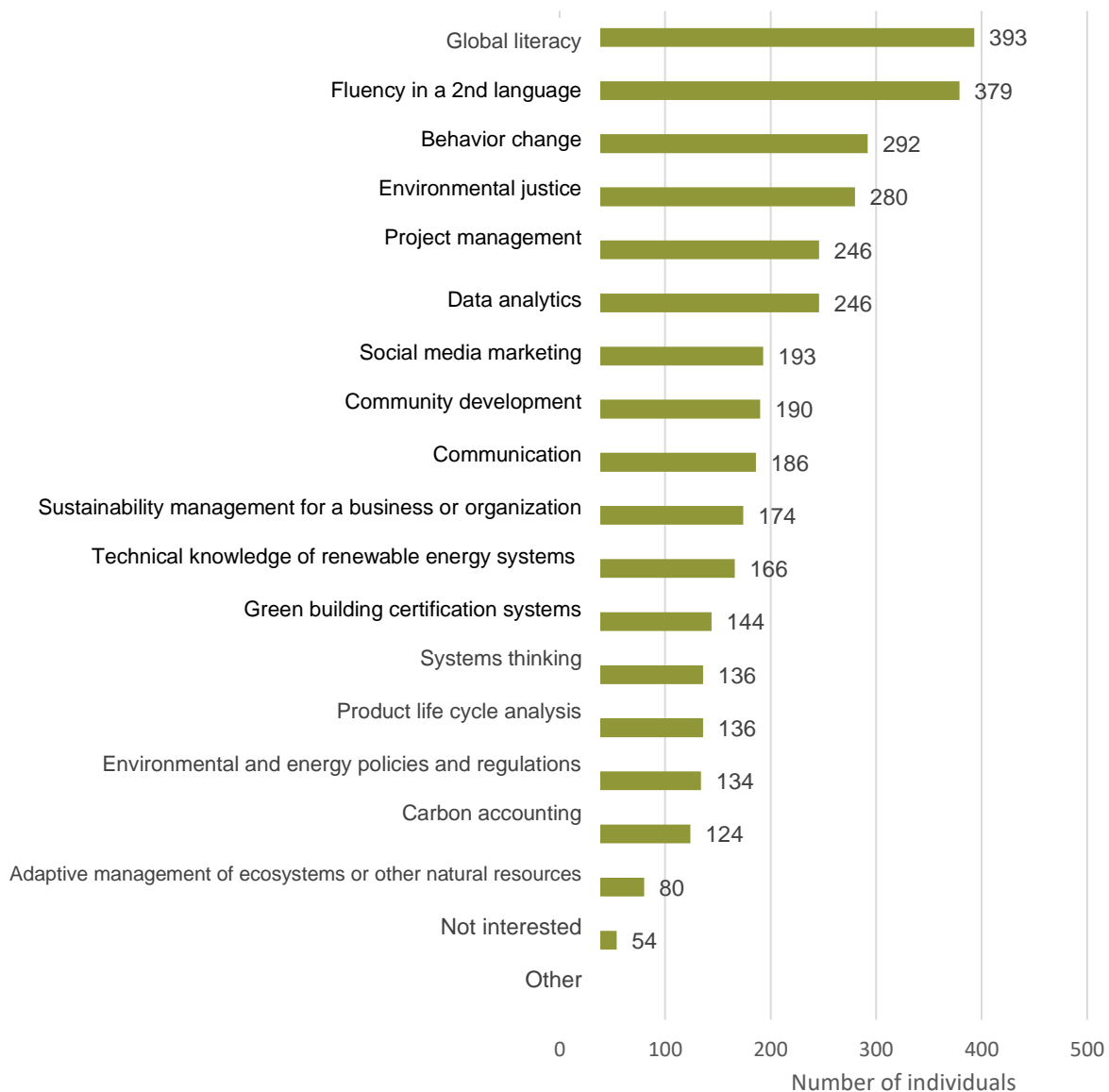
Students were also asked to choose three topics they would like to learn more about through taking sustainability-related courses at Ohio State (N = 1,410). As seen in Figure 13, climate change, health & wellbeing, and clean & renewable energy are the most popular topics.

**Figure 13. Number of students that chose each preferred topic in sustainability related coursework.**



Lastly, students were asked about sustainability-related skills they would be most interested in gaining by the time they graduate as part of their professional development (N = 1,410; Figure 14). They could choose up to three topics or indicate they weren't interested in any of the topics. The majority of students were interested in global literacy, followed by fluency in a second language, behavior change, and environmental justice.

**Figure 14. Number of students that chose each preferred sustainability-related skill for professional development**



# Section 4: Sustainability Knowledge Assessment

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We assessed student knowledge of sustainability topics and issues using the 12-item “ASK” (Assessment of Sustainability Knowledge) scale developed by Zwickle and Jones (2018), which measures knowledge related to ecological, economic, and social aspects of sustainability. Students were asked to answer multiple-choice quiz questions to the best of their ability. (Note that we did not include a “do not know” option, so scores may be slightly inflated due to additional guessing. Questions that students viewed but skipped were still counted as ‘incorrect’, however).

Overall, **student knowledge of sustainability and environmentally-related topics were high**, with an average of 8.5 items correct out of 12 ( $SD = 2.22$ ), or 71% correct. We observe that students were often correct on more technical questions such as the purpose of ozone (90.5% correct), the biggest global emitter of greenhouse gasses (89.8% correct) and describing changes in the wealth gap in America (89.5% correct). **However, some major misconceptions remain among students**, often in relation to **causes of pollution and environmental degradation**. For example, 43.1% of students incorrectly answered that pollution is the main cause of Atlantic fish stock depletion (only 31.3% gave the correct answer, overfishing). In addition, 26.9% of students thought that leaving a cell phone charger plugged in for 12 hours has a larger environmental impact than producing a hamburger, which is incorrect. These and other lower-score items could point to potential gaps in student understanding where education or interventions could be targeted in the future.

The percent of students answering correctly stayed the same or improved across all questions except one. **Fewer students correctly identified that the most common cause of pollution in streams and rivers is surface runoff (2019: 44.4%; 2018: 50.8%), with more students incorrectly believing that waste from factories was the most common cause of pollution.** It is also possible to estimate changes in sustainability knowledge by comparing answers between the 2014 and 2019 versions of this survey. The average student score in 2014 was 6.93 out of 12 items ( $SD = 3.05$ ), or 58% correct. Taking into consideration some scale changes, this result suggests that **students in 2019 are, on average, getting the correct answer on 1.5 more questions than students in 2014.** For students that took the survey in 2018 and 2019, we see on average a half-point increase in scores from 2018 to 2019 (Mean difference  $ASK_{2018} - ASK_{2019} = -0.60$ ,  $N = 642$ ). In future years, this survey will continue to track student sustainability knowledge, and possible causes behind these positive increases.

**Table 3. Responses to ASK items in 2018 and 2019.**

ASK Question	Correct Answer	% Correct (2019) N = 3276	% Correct (2018) N = 2872
	Most Common Incorrect Answer	% Incorrect (2019)	% Incorrect (2018)
1) What is the most common cause of pollution of streams and rivers?	"Surface water running off yards, city streets, paved lots, and farm fields"	44.4%	50.8%
	"Waste dumped by factories"	36.3%	24.1%
2) Ozone forms a protective layer in the earth's upper atmosphere. What does ozone protect us from?	"Harmful UV rays"	90.5%	87.3%
	"Climate change"	4.2%	5.4%
3) Which of the following is an example of sustainable forest management?	"Never harvesting more than what the forest produces in new growth"	78.0%	76.1%
	"Setting aside forests to be off limits to the public"	16.5%	15.1%
4) Of the following, which would be considered living in the most environmentally sustainable way?	"Reducing consumption of all products"	70.9%	65.6%
	"Recycling all recyclable packaging"	19.2%	20.8%
5) Which of the following is the most commonly used definition of sustainable development?	"Meeting the needs of the present without compromising the ability of future generations to meet their own needs"	84.5%	80.7%
	"Setting aside resources for preservation, never to be used"	6.6%	8.0%
6) Over the past 3 decades, what has happened to the difference between the wealth of the richest and poorest Americans?	"The difference has increased"	89.5%	85.0%
	"The difference has stayed about the same"	7.5%	9.9%

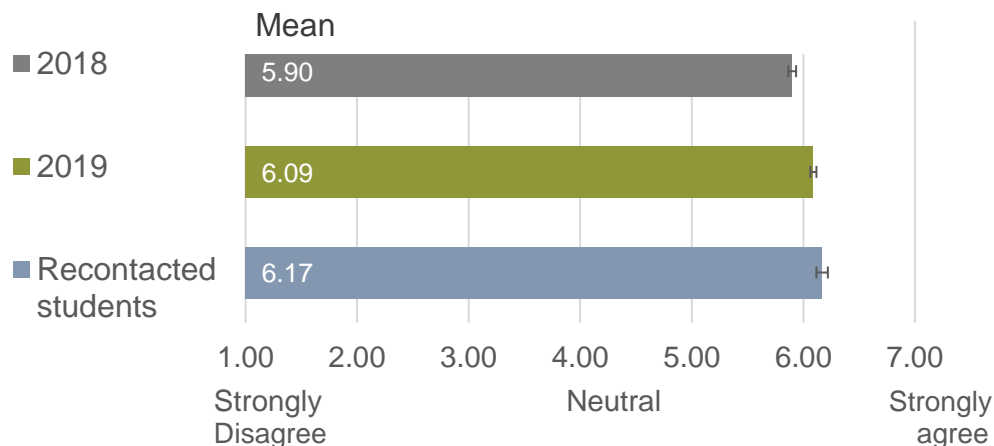
7) Many economists argue that electricity prices in the U.S. are too low because	"They do not reflect the costs of pollution from generating the electricity"	69.9%	68.1%
	"Electric companies have a monopoly in their service area"	21.3%	19.9%
8) Which of the following is the most commonly used definition of economic sustainability?	"Long term profitability"	57.3%	56.6%
	"When costs equal revenue"	28.2%	26.9%
9) Which of the following countries passed the U.S. to become the largest emitter of the greenhouse gas carbon dioxide?	"China"	89.8%	86.5%
	"Japan"	3.9%	5.2%
10) Which of the following is a leading cause of the depletion of fish stocks in the Atlantic Ocean?	"Fishermen seeking to maximize their catch"	31.3%	29.0%
	"Ocean pollution"	43.1%	45.1%
11) Which of the following is the best example of environmental justice?	"All stakeholders from an indigenous community are involved in setting a quota for the amount of wood they can take from a protected forest next to their village"	81.7%	75.2%
	"The government dams a river, flooding Native American tribal lands to create hydro-power for large cities"	7.5%	9.6%
12) Put the following list in order of the activities with the largest environmental impact to those with the smallest environmental impact:	"Flying in a commercial airplane from Washington D.C. to China" > "Producing one McDonald's quarter-pound hamburger" > "Producing one McDonald's chicken sandwich" > "Keeping a cell phone charger plugged into an electrical outlet for 12 hours"	57.7%	45.2%
	"Flying in a commercial airplane from Washington D.C. to China" > "Keeping a cell phone charger plugged into an electrical outlet for 12 hours" > "Producing one McDonald's quarter-pound hamburger" > "Producing one McDonald's chicken sandwich"	26.9%	33.0%

# Section 5: Sustainability Attitudes and Values

We measured student sustainability values and attitudes using the 11-item “SAS” (Sustainable Attitudes) scale developed by Zwickle and Jones (2018). Students were asked to respond with how much they agreed or disagreed with a number of pro-environmental attitudes and values such as “Biological diversity in itself is good”, and “I am willing to put forth a little more effort in my daily life to reduce my environmental impact” on a scale of 1 – 7 (“strongly disagree” to “strongly agree”). Individuals’ scores on this scale were calculated by averaging all responses together.

Overall, **scores on this scale were fairly high**, with the average score being a 6.09 out of 7 (Figure 5). For students that took the survey in both 2018 and 2019, we see a small upward trend in scores (Mean difference SAS2019 – SAS2018 = 0.16, N = 579). We will continue to use this scale on future versions of the survey to measure changes over time in the undergraduate student population, potentially as a result of sustainability efforts at Ohio State. This scale will also be used in AASHE STARS reporting on campus sustainability values.

*Figure 5. Averaged scores for Sustainable Attitudes Scale (SAS)*





# Section 6: Next Steps and Acknowledgements

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**Next steps:** Currently plans are in place repeat the campus sustainability survey in 2020 and proceeding years, with the understanding that some adjustments may be necessary due to COVID-19. We plan to again replicate longitudinal items with a panel sample of Undergraduate students and adapt new sections for Faculty research and campus partner objectives.

The Environmental and Social Sustainability Lab continues to work with diverse campus partners to inform progress towards sustainability goals, and assess the results of related efforts on campus. Our goal is that this survey will continue to provide high-quality social scientific data of use to both academic researchers and the broader campus sustainability community for years to come.

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**Contact us:** If you are interested in becoming involved in this effort at Ohio State, or are interested in using our data for educational or research purposes please contact us at [ESSL@osu.edu](mailto:ESSL@osu.edu). A report on these findings can be found on our website: <https://ess.osu.edu/campus-sustainability-survey/reports>.

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