

Sustainability and Carbon Neutrality Literacy Survey Analysis

Method

On **November 18, 2017**, an electronic survey was sent to **42,450** email addresses which were registered with Ohio University as a student, faculty or staff member at any one of the University's campuses. It should be noted that this survey pool included any email address ending in "ohio.edu" and, therefore, included some past students and retired employees. The survey closed on **December 18, 2017**.

Questions for this survey were carefully selected to be able to gather data regarding basic literacy associated with the science of climate change, opinions about the issue, understanding of Ohio University's efforts and general demographic information (particularly title and campus association). Where possible, questions from the previous survey remained the same so as to offer accurate comparative data. However, some questions were altered to be able to reference more current scientific reports.

Analysis

Responses

Overall

Of the 42,450 survey links sent out, 977 individual responses were opened, with 959 complete responses recorded, giving this survey a 2.25% response rate. This percentage is much lower than the 17.4% response for last year's survey. Though, the number of email addresses included in the pool was approximately 7 times larger than in 2016.

The survey contained 16 questions, 6* of which were utilized to identify the campus community's Sustainability and Carbon Neutrality Literacy Rate. In 2017, the aggregate score for all demographics identified in the survey was 73%. This score, compared to Fall 2016 survey results yielding at 67% literacy rate, suggests that Ohio University is improving upon its campus-wide understanding of issues relating to sustainability and carbon neutrality. The relatively low comprehension rate overall, though, suggests that increased outreach and engagement is needed.

*The 6 questions utilized to determine the literacy score are identified with an asterisk.

Students

The Sustainability Plan and the Climate Action Plan both require sustainability literacy rates be broken down into demographics showing student responses by first-year and non-first-year students. Of the survey responses, 70.7% were students, with 16.27% of responses from first-year students and 55.37% from returning students. The rate of first-year respondents is somewhat higher than last year's rate of 15.1%.

First Year Students

One of the reasons for isolating the first-year demographic is to assess the knowledge of the average incoming student. When compared to the answers of students close to graduation, a conclusion can be drawn about the amount of sustainability knowledge gained from attendance at Ohio University.

The first-year literacy rate was 74%, compared to 73% in both the graduating student group and the rest of the student population. In 2016, the first-year literacy rate was 68%, compared to 71% for graduating students and 72% in the rest of the student population. From these numbers, it can be concluded that additional education to students regarding sustainability and climate science is needed. The slight decrease in overall scores from first year to graduating students suggests that, while students retain most of their knowledge, increased sustainability engagement is not offered to students during their full four years on campus.

Questions

Question 1

This question was asked to determine the visibility of sustainability efforts on campus. As in the last version of this survey (sent out in Fall2016), the most well-known efforts related to waste management, transportation improvements, energy efficient appliances and energy source shifting, shown in Figure 1.

1 - Ohio University has committed to becoming a Carbon Neutral campus by, at least, 2075. Of the following activities, which are you aware of having occurred on the campus which you work or study?

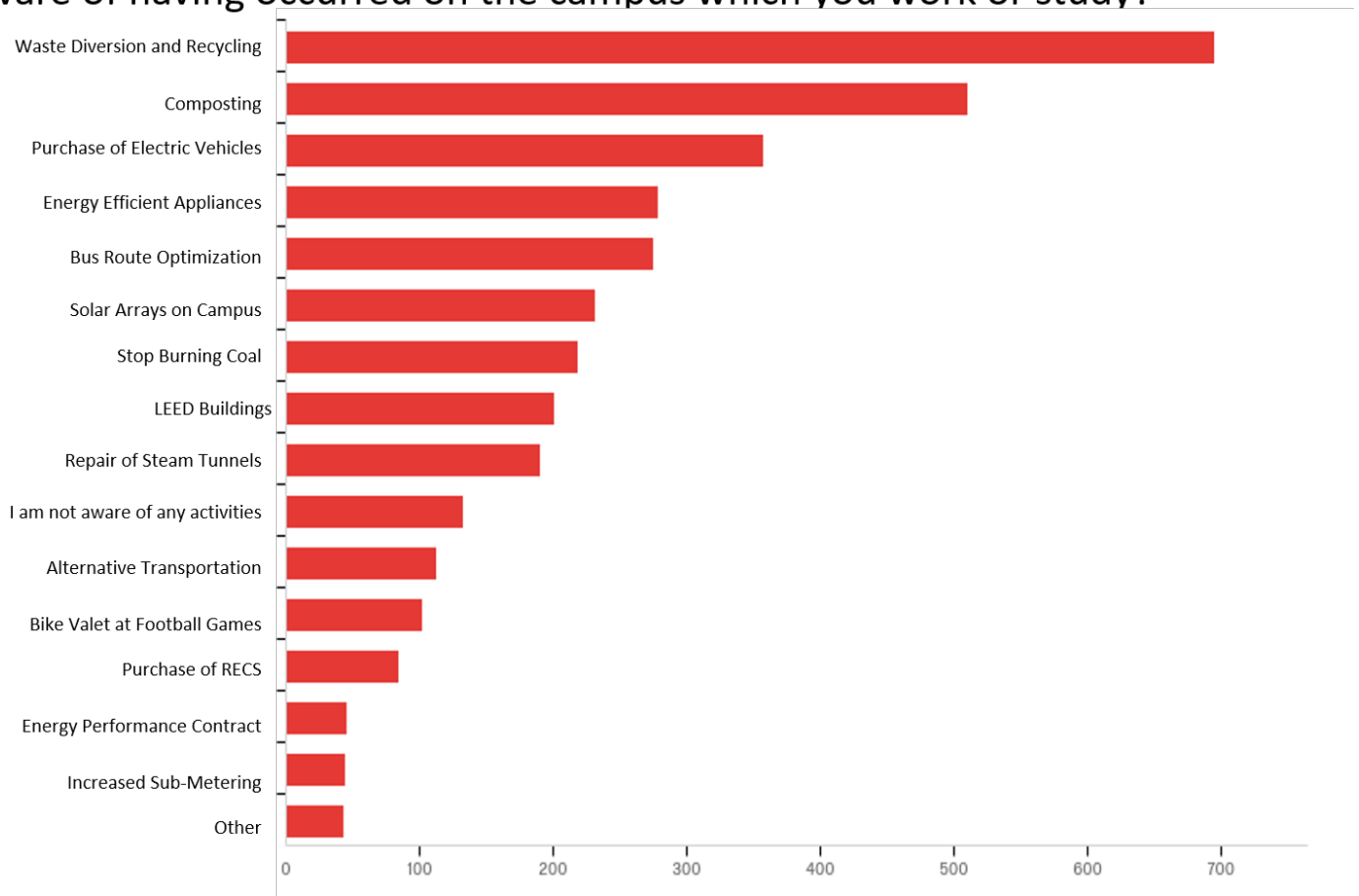


Figure 1. Implementation awareness responses.

Question 2

Question 2 relates to the opinions of students, faculty, staff, and alumni on climate change and if the causes of climate change are anthropogenic. On a scale of 1-10, respondents were asked to rate their level of agreement with the following statement, "I believe that the global warming of the past 50 years is due primarily to human-induced increases in heat-trapping gases".

2 - On the scale below, please indicate your degree of agreement with the following statement: "I believe that the global warming of the past 50 years is due primarily to human-induced increases in heat-trapping gases."

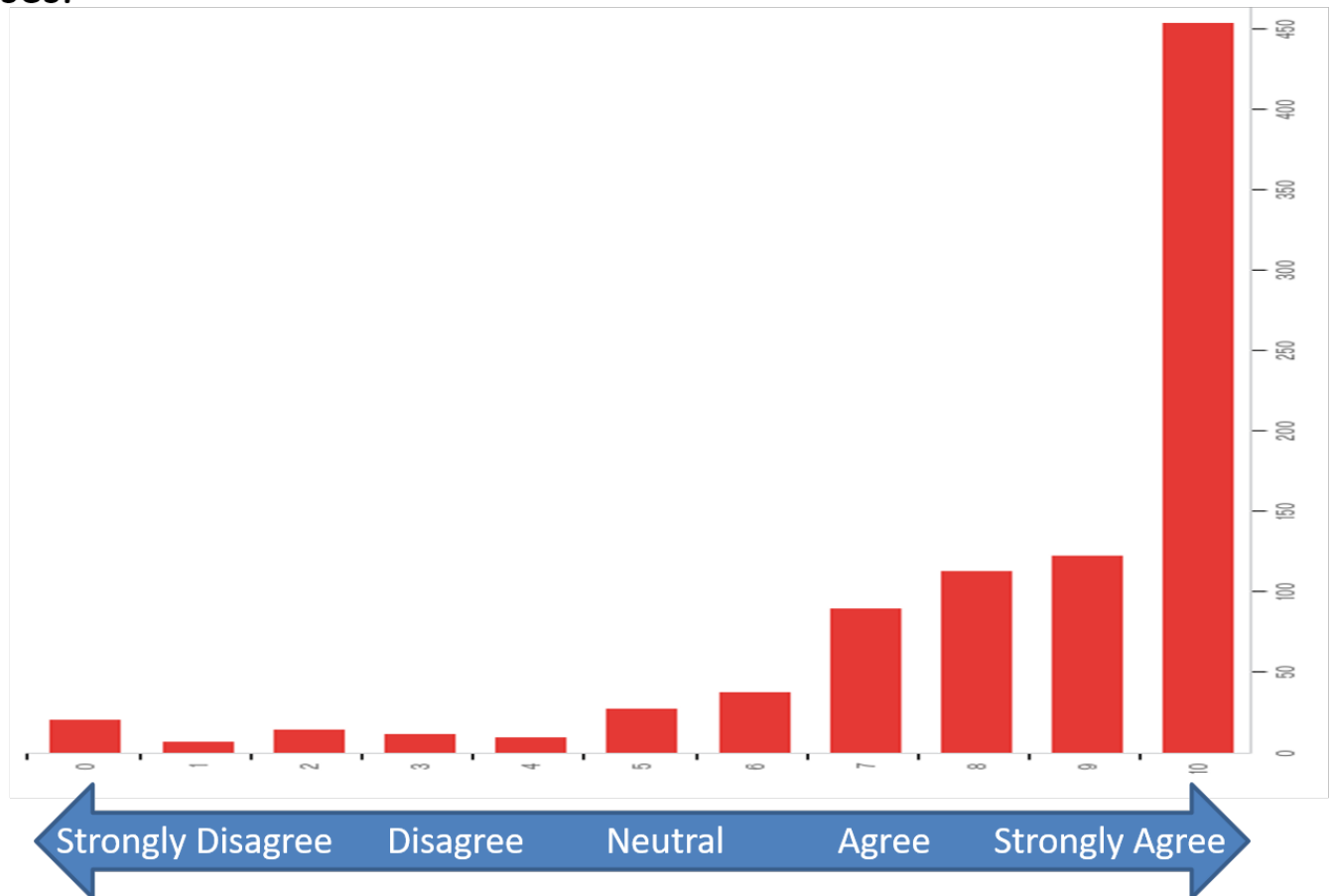


Figure 2. Anthropocentric belief responses.

Question 3*

Question 3 is based on common-core knowledge often taught in elementary science classes. In the February 2016 version of this survey, almost one-fifth of respondents answered incorrectly, which led to a conclusion that there must be a gap in science education. The question is, “What is the most common gas in the Earth’s atmosphere?” with possible answers of a) Nitrogen b) Oxygen and c) Argon. The correct answer is Nitrogen, which 80% of respondents did get correct in Fall 2017.

3* - What is the most common gas in the Earth's atmosphere?

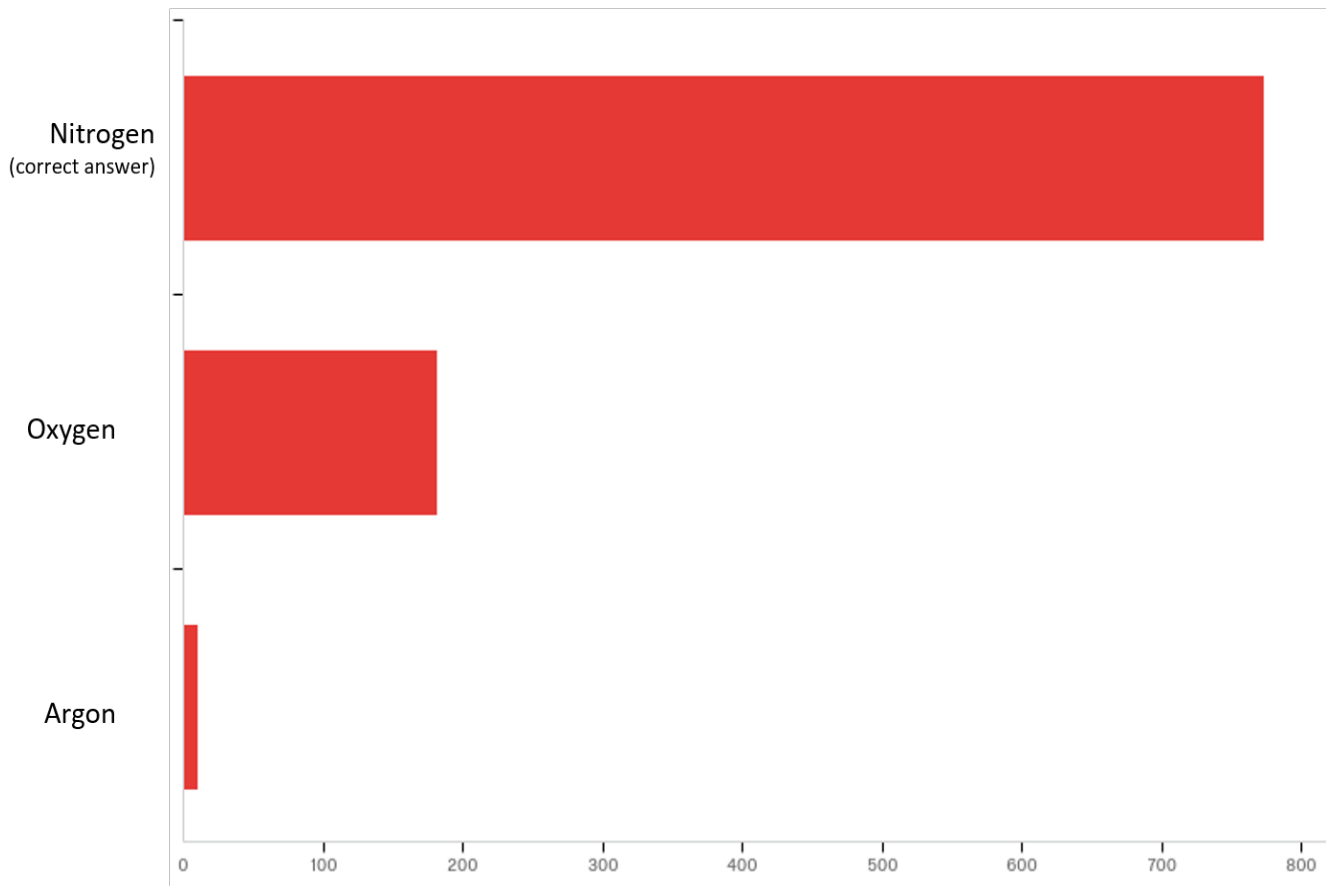


Figure 3. Responses to atmospheric makeup question.

Question 4*

This question also relates to basic science knowledge, but tends to have a lower correct response rate. The question, “Which of these is not a greenhouse gas?” has possible answers of a) Carbon Dioxide b) Nitrogen and c) Water Vapor. Nitrogen is the correct answer.

Only 33% of the general surveyed population answered this question correctly, compared with an average correct response of 39% in Fall semester of 2016.

4* - Which of these is not a greenhouse gas?

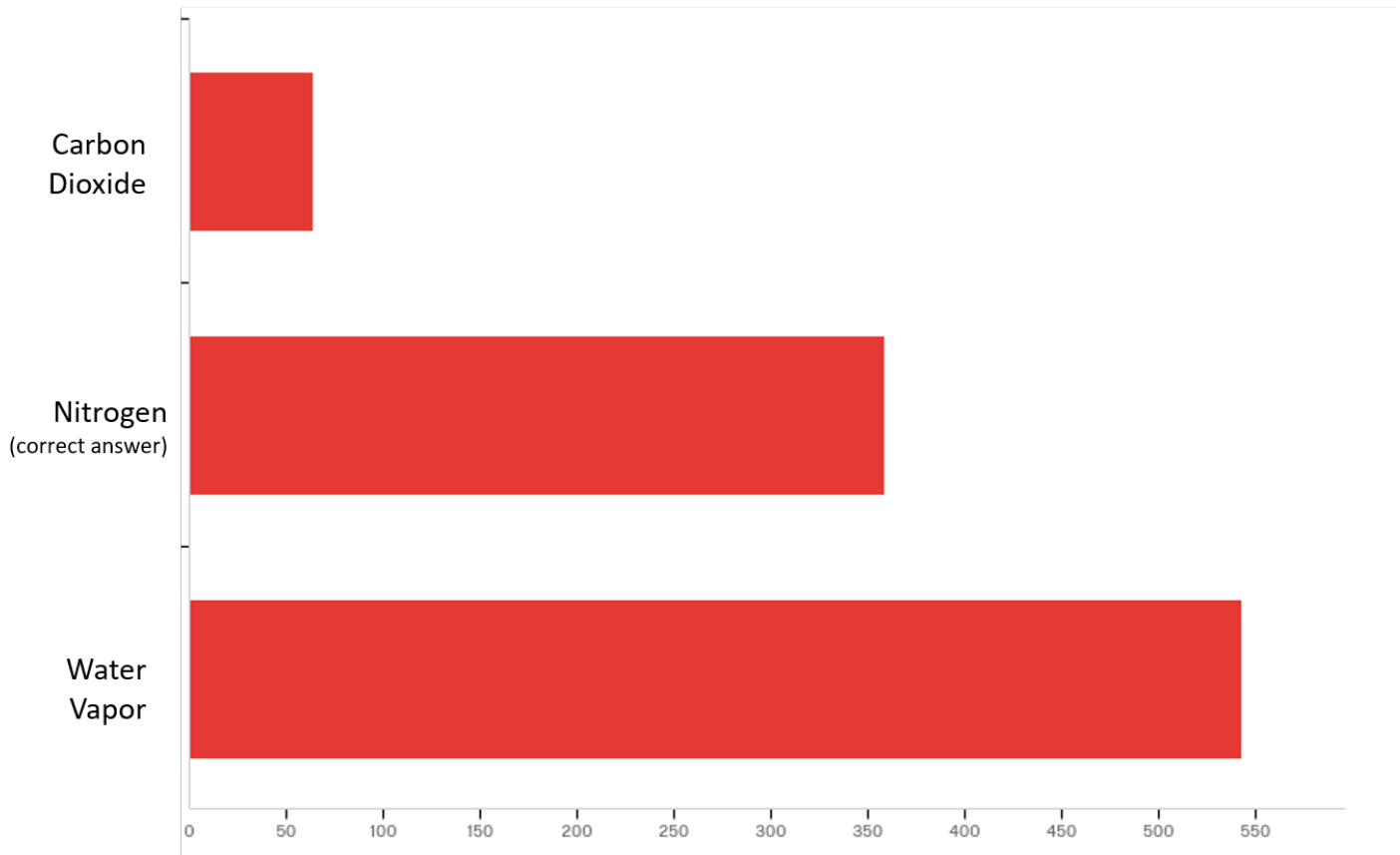


Figure 4. Responses to greenhouse gas question.

Question 5*

Question 5 asks respondents to finish a statement correctly. This statement comes from recent climate science, and as a result may have fewer correct answers. It says, “According to NASA's Goddard Institute for Space Studies, what is the hottest year on record?” with answers a) 1982 b) 1998 c) 2009 and d.) 2016.

Figure 5 shows that overall, a majority (75%) of respondents knew—or at least could deduce—that the hottest year on record was 2016.

5* - According to NASA's Goddard Institute for Space Studies, what is the hottest year on record?

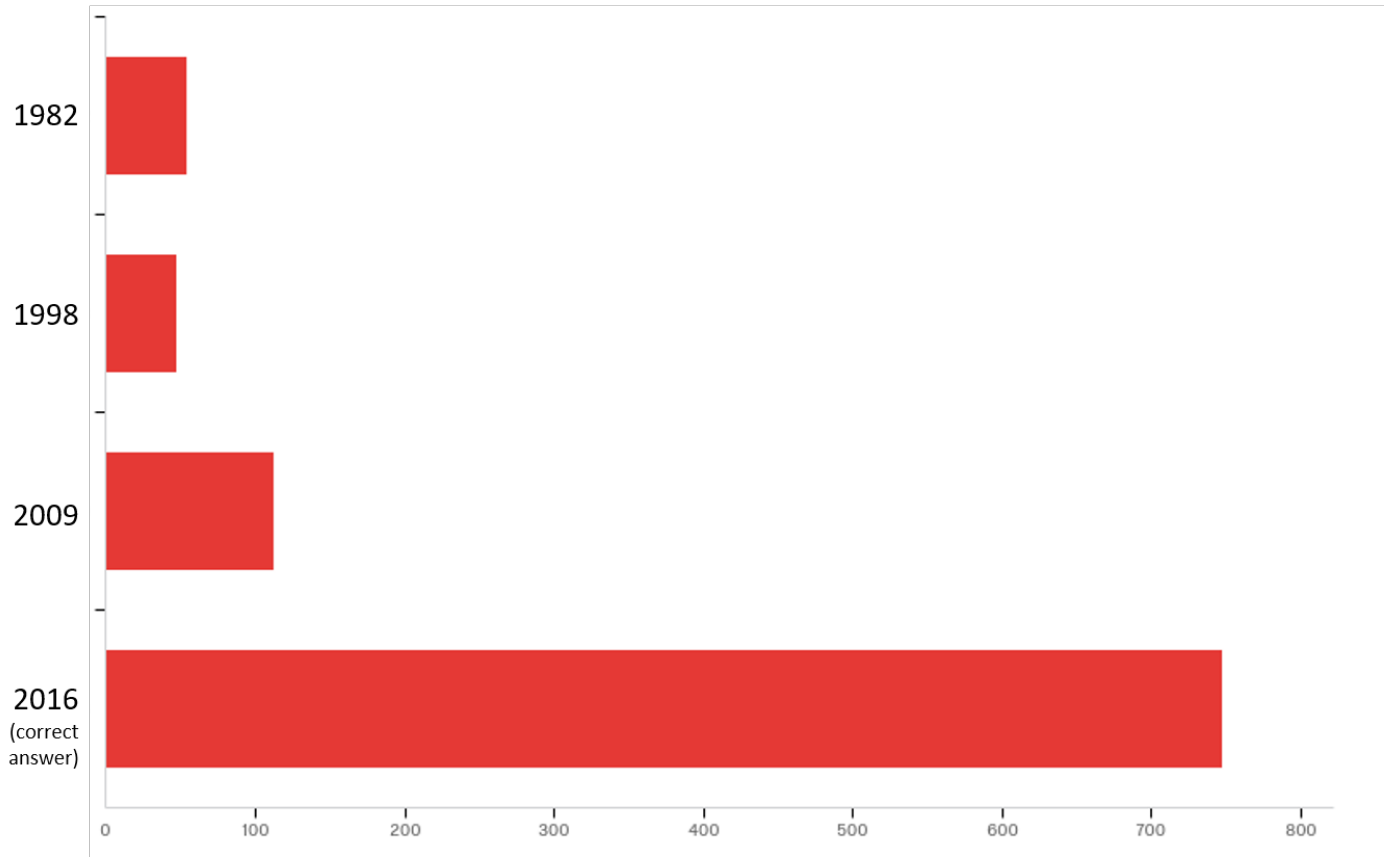


Figure 5. Responses to timeline question.

Question 6

This question is a subjective inquiry as to the campus' understanding of the definition of "sustainability." While there is no correct answer to this question, the University defines sustainability as "Meeting the needs of the present without compromising the needs of future generations," which was the answer overwhelmingly selected by respondents.

6 - What do you believe is the best definition of "sustainability"?

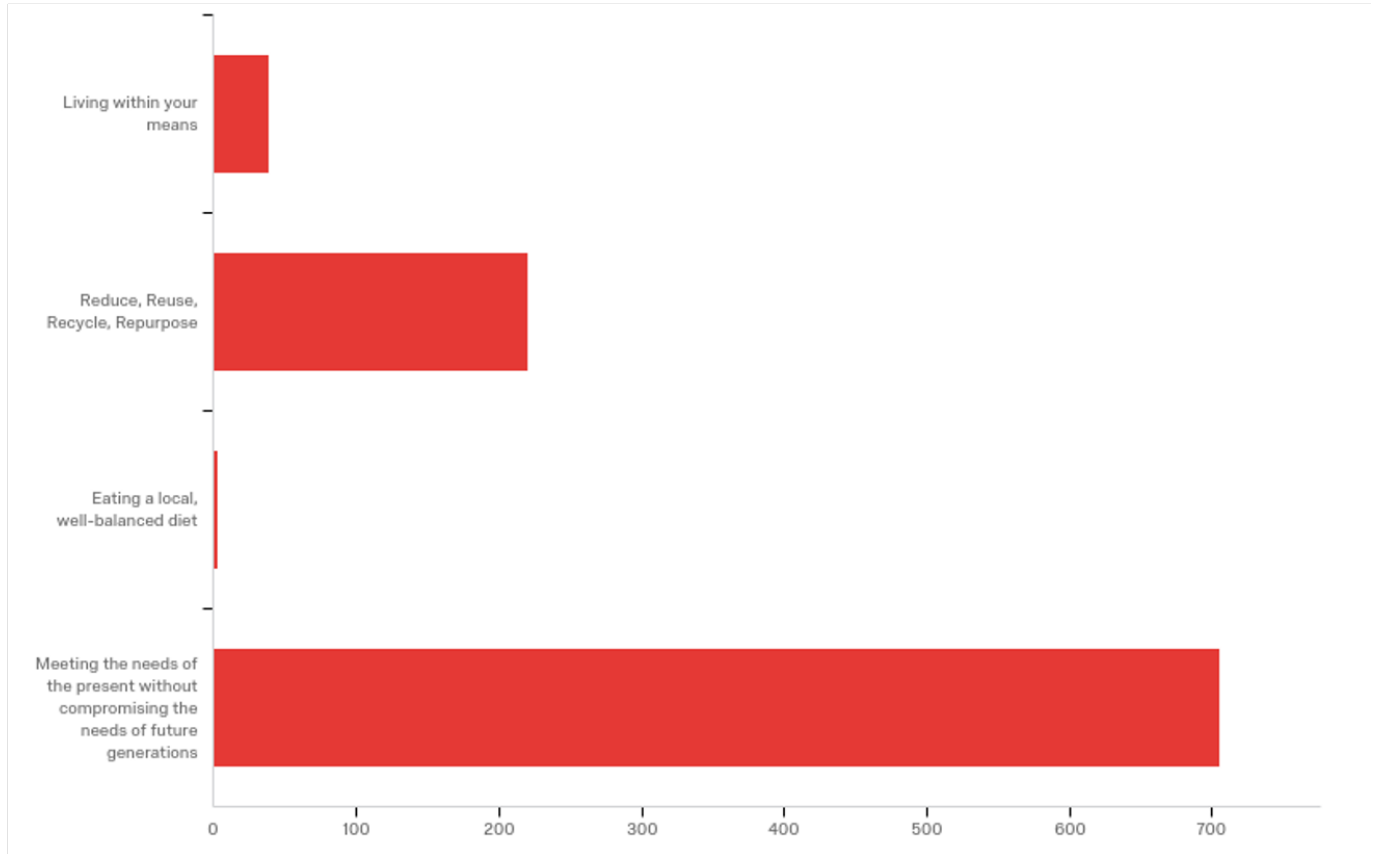


Figure 6. Responses to sustainability definition question.

Question 7*

This question is another to do with recent climate science. It asks, "Will precipitation rates increase, decrease or stay the same if the Earth's global temperatures continue to rise?" with answers of a) increase b) decrease and c) stay the same. The correct answer is that the precipitation rates will increase, which 92% of the total surveyed population selected, as opposed to 55% correct responses in Fall semester 2016.

7* - Will precipitation rates increase, decrease or stay the same if the Earth's global temperatures continue to rise?

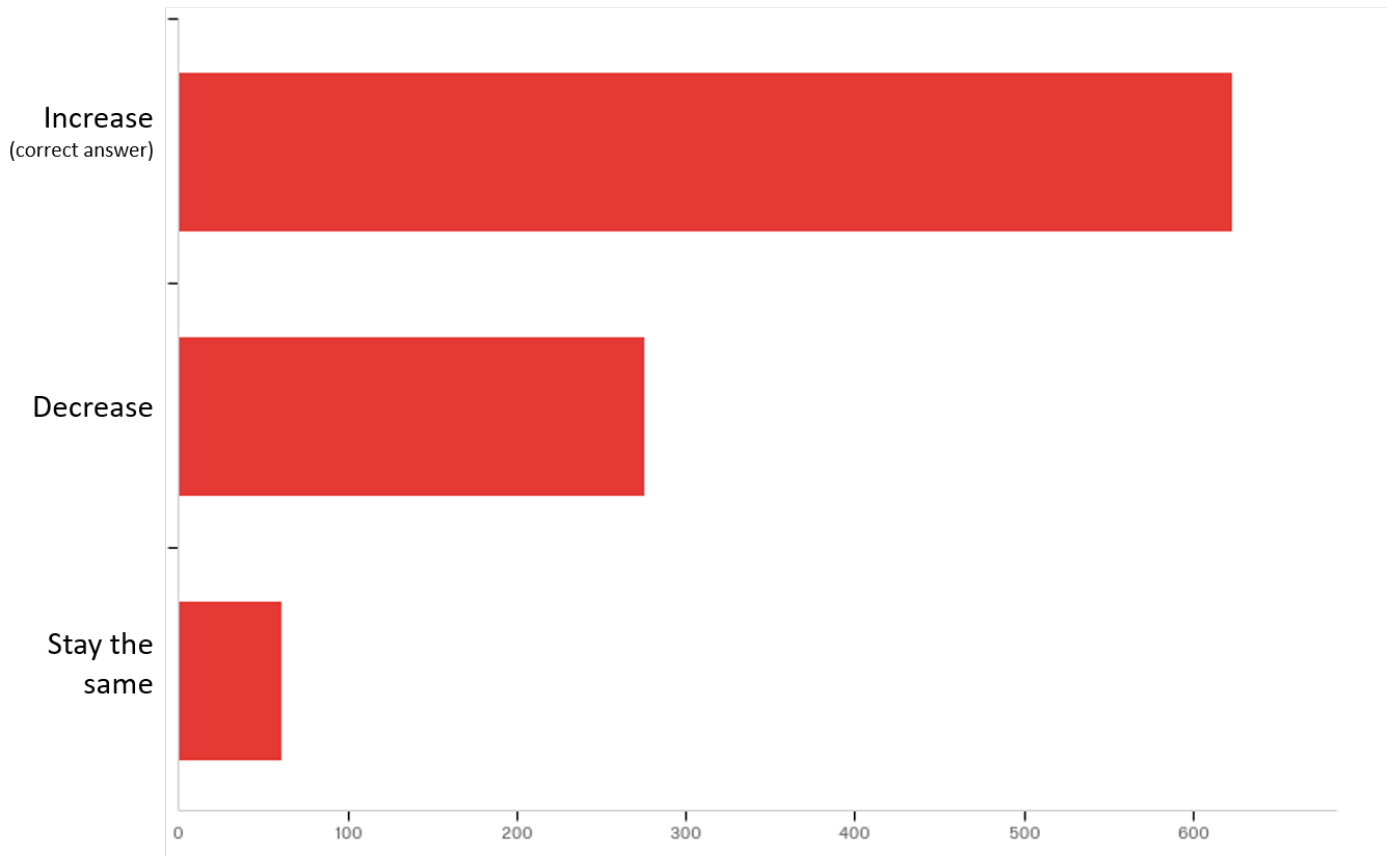


Figure 7. Responses to precipitation question.

Question 8*

This question relates to methods of data acquisition by climate scientists. Usually, the general population does not have this as common knowledge. The question asks, "According to NASA's Goddard Institute for Space Studies, how do scientists collect data regarding climate?" with answers a) Remote sensing from space with satellites b) Ground based measurements of surface temperature/carbon dioxide concentration/sea level c) By collecting "proxy data" from tree rings/ice cores/historical records and d) All of the above. The correct answer is d) All of the above.

Figure 8 shows that almost all (92%) of the surveyed population answered this question correctly, which could be due to an actual grasp of the information or could be due to the phrasing of the question making guesswork easy.

8* - According to NASA's Goddard Institute for Space Studies, how do scientists collect data regarding climate?

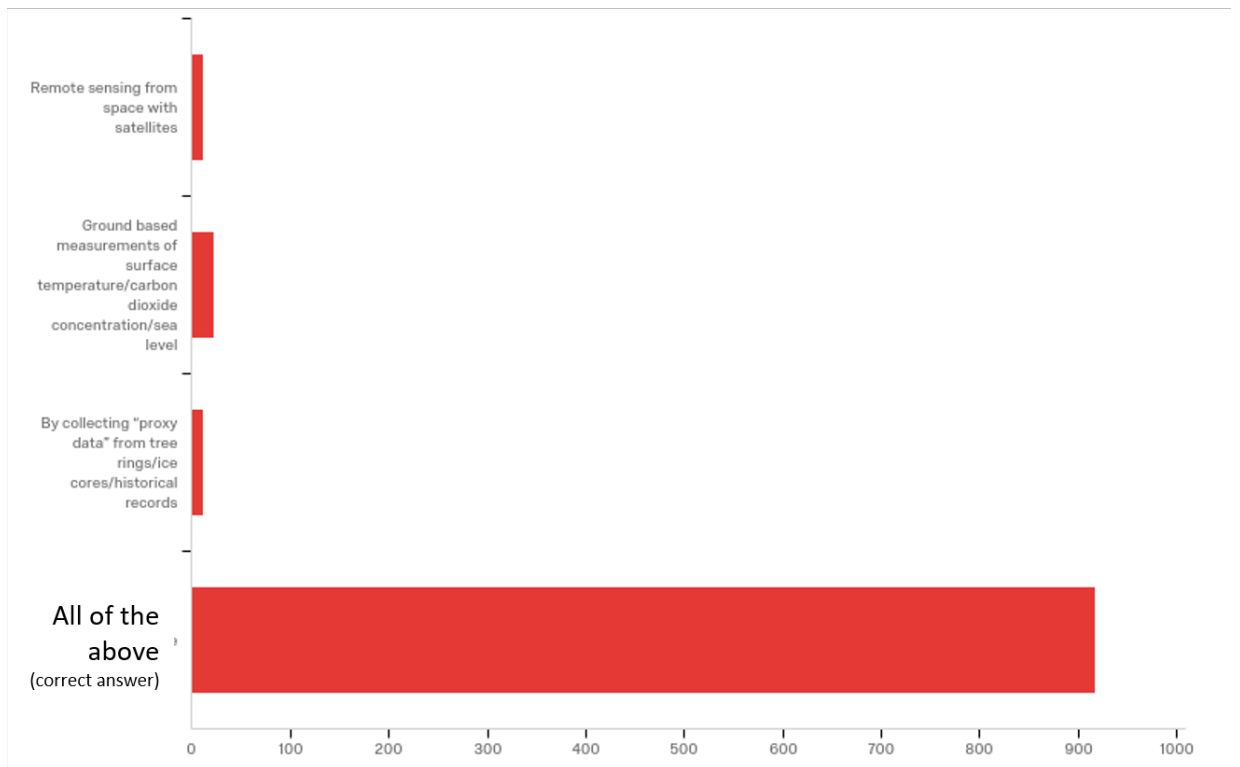


Figure 8. Responses to data acquisition question.

Question 9*

Question 9 deals with the conclusion reached by the IPCC about climate change. It states, “In its Fifth Assessment Report, the Intergovernmental Panel on Climate Change concluded:” with finishing phrases of a) Human-caused climate change is not occurring at a rapid rate and, therefore, current generations are not at risk b) Human influence on the climate system is clear, and recent anthropogenic emissions of greenhouse gases are the highest in history and c) The Earth will begin cooling within the next decade. The actual conclusion was the second choice, with 90% of answers being the correct one.

9* - In its Fifth Assessment Report, the Intergovernmental Panel on Climate Change concluded:

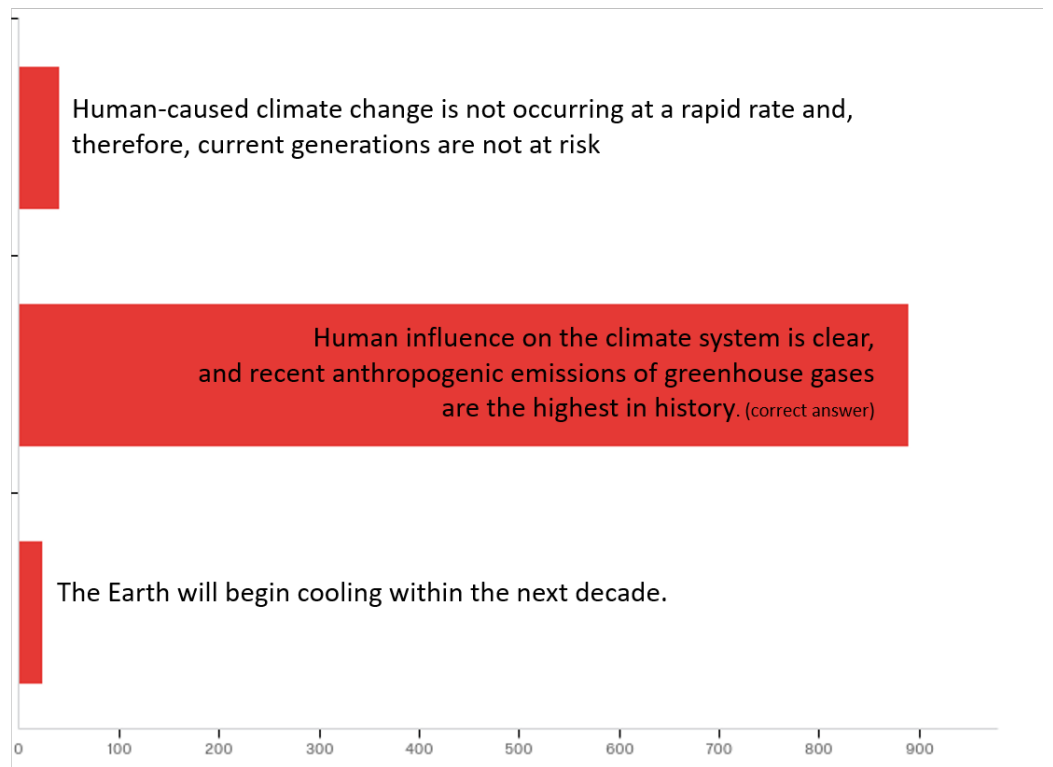


Figure 9. Responses to IPCC conclusion question.

Question 10

This question was intended to gauge if the campus population understood the triple bottom line of sustainability. With a majority of responses selecting “All of the above,” we can conclude that the majority of campus understands that sustainability is a complex concept that must equally consider environmental preservation/conservation, social health and well-being, and economic vitality.

10 - What do you feel are the main tenets of sustainability

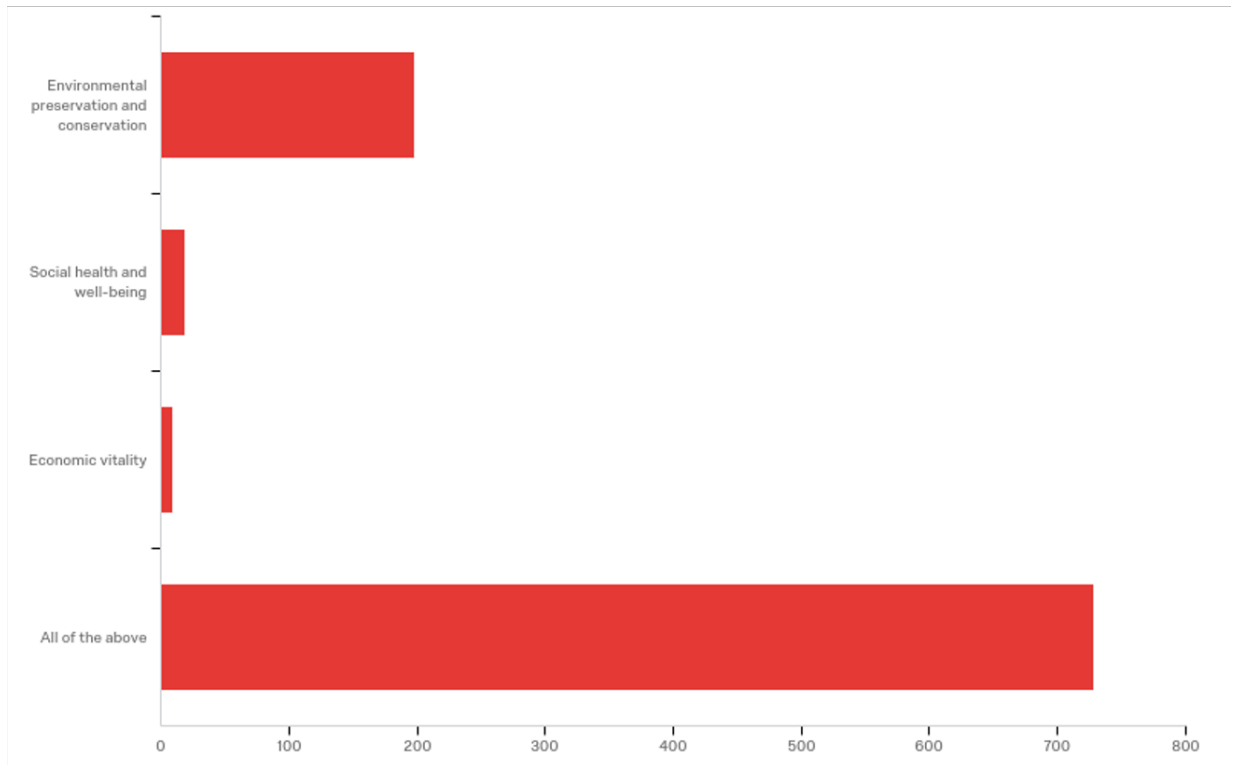


Figure 0. Responses to tenets of sustainability question.

Question 11

This question asks the respondent to think about which activities they are personally willing to participate in to help reduce the amount of greenhouse gases emissions they contribute to during their time at OHIO.

11 - In which of the following activities, if any, are you willing to engage so as to contribute to reductions in greenhouse gas emissions during your lifetime?

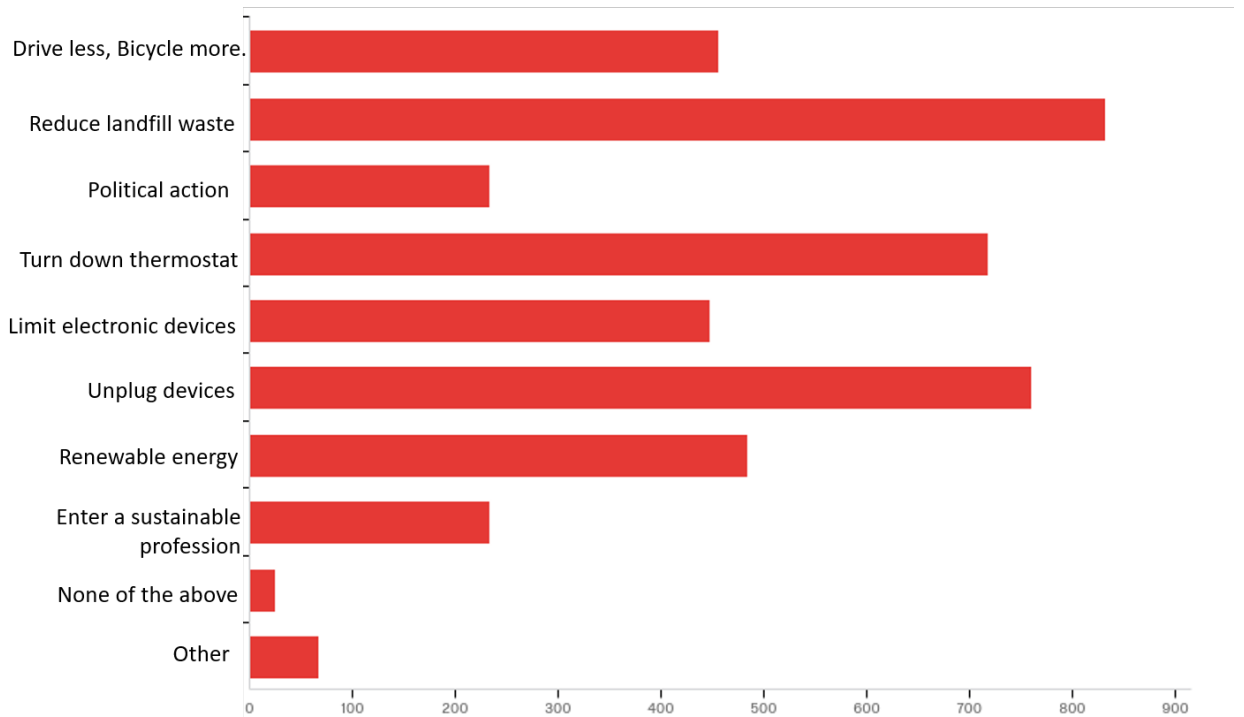


Figure 11. Responses to individual changes question.

From these results, it can be concluded that students, faculty, staff, and alumni are most willing to participate in activities that can be seen as smaller daily tasks, such as unplugging devices when not in use. Less common were the answers that involved long-term changes, such as choosing a sustainability-related career or becoming politically involved. Least common of all were “Other” (which respondents most likely did not choose because they did not want to create their own answers) and “None of the above/I don’t believe I can make an impact”. Having the latter choice be the least common answer is very encouraging to sustainability education, as it means that 99% of the surveyed population believe they can make an impact.

Question 12

This question aims to gauge if the campus community understands the impact they make on the environment by first knowing what a carbon footprint is and then calculating their footprint.

12 - Have you calculated your own carbon footprint?

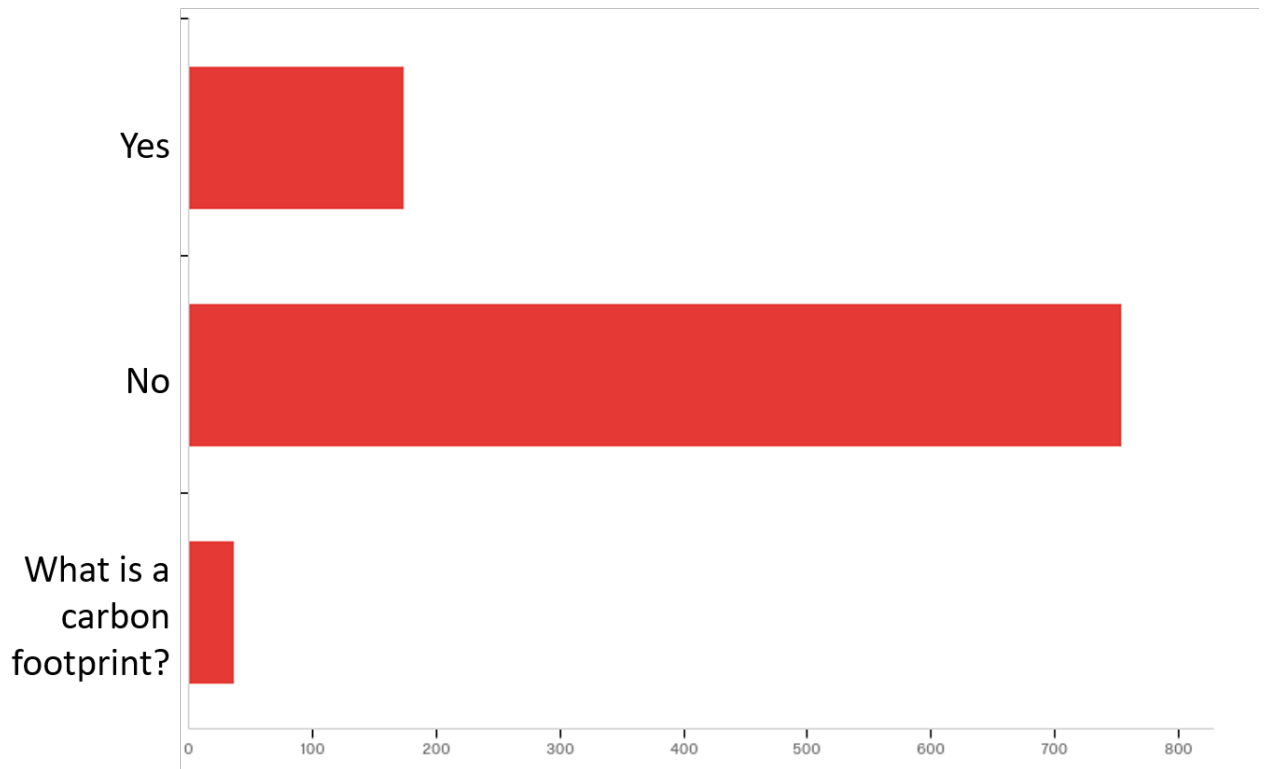
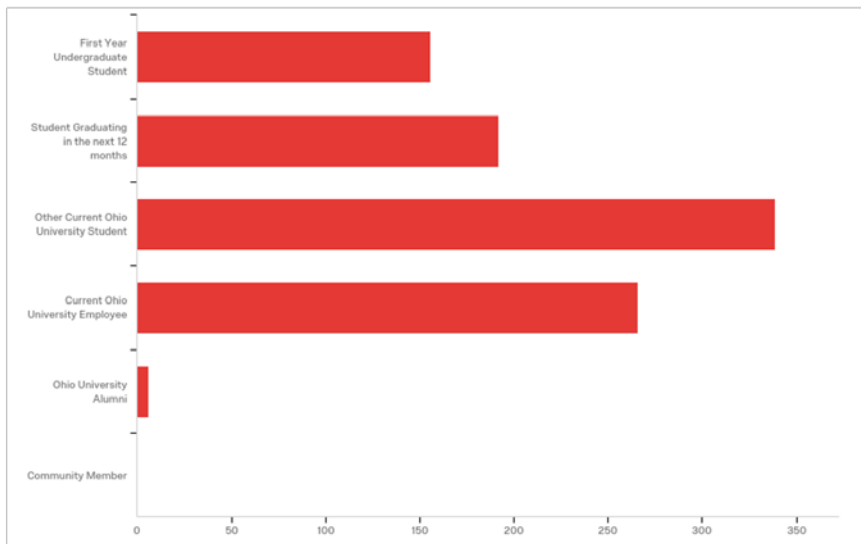


Figure 3. Responses to carbon footprint question.

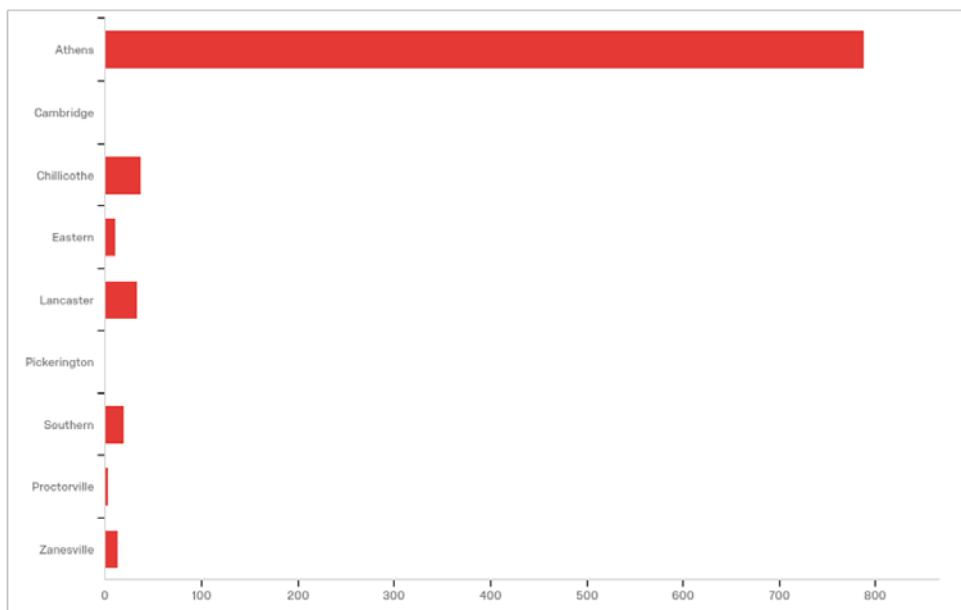
Questions 13 and 14

These questions are demographic questions which are utilized to sort data based on respondent status and location.

13 - Please select the item which best describes your role at Ohio University:



14 - With which campus do you best identify?



Figures 13 and 14. Responses to demographic questions.

The final 2 questions, #15 and #16, were utilized for internal uses only as they asked students who were receiving course credit for the survey to provide their name (Question 15) and the name of their professor (Question 16). Since such information does not contribute to the data needed for this report, the responses were omitted here.

Overall Literacy Rate

Since questions 3-5 and 7-9 were science-based questions, they each had a correct answer. By using the basic grading scale in Table 1, literacy rates can be determined for the entire OHIO community, the general student body, and first-year students.

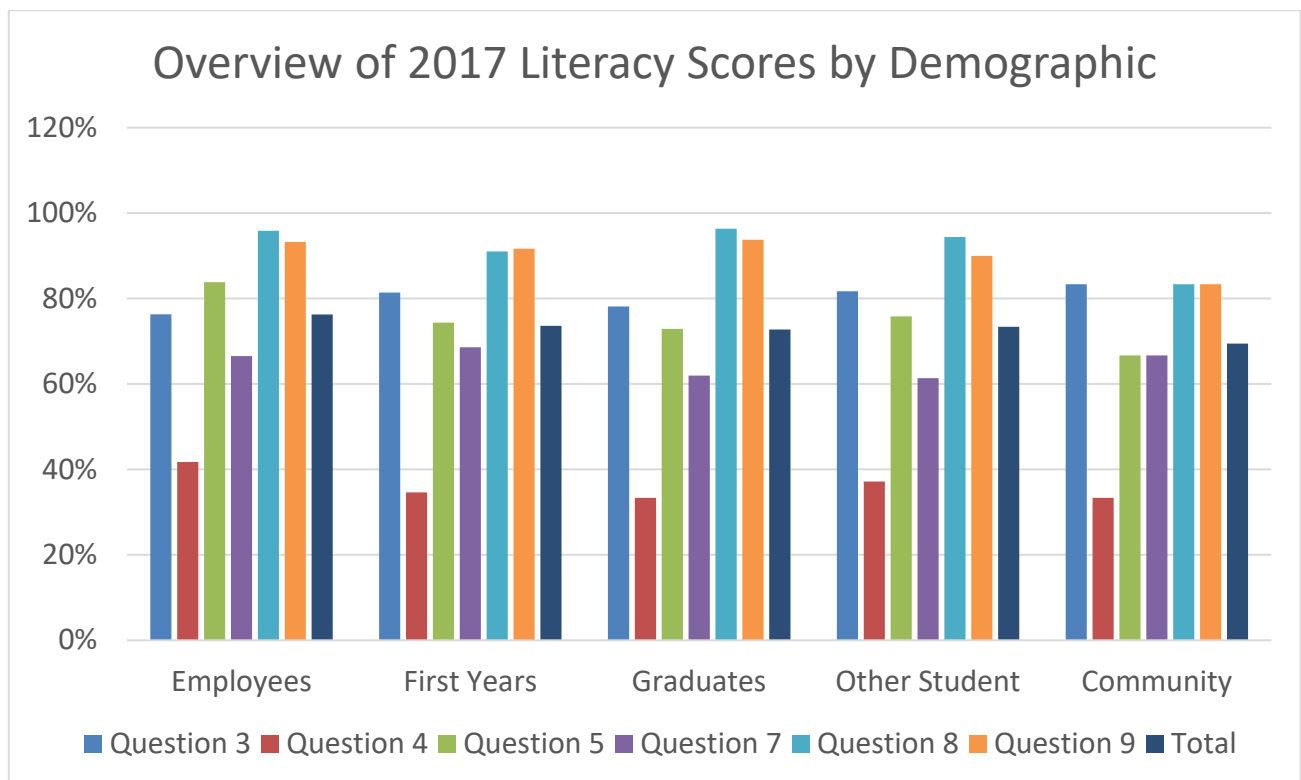
OVERALL LITERACY RATE: 67%, or D+

FIRST-YEAR STUDENT LITERACY RATE: 68%, or D+

Table 1. Grading scale used for sustainability literacy rate.

A = 93 – 100 %	A- = 90 – 92 %	B+ = 87 – 89 %	B = 83 – 86 %
B- = 80 – 82 %	C+ = 77 – 79 %	C = 73 – 76 %	C- = 70 – 72 %
D+ = 67 – 69 %	D = 63 – 66 %	D- = 60 – 62 %	F = 59 – 0 %

The entire OHIO community surveyed had the literacy breakdown shown in Figure 15.



Conclusion

The overall sustainability literacy rate for the OHIO community has increased 6% in 14 months. However, it is on par with the results from 17 months prior.

Next Steps

The next steps should remain similar to those after the last survey, namely:

- Work toward increasing campus community knowledge of carbon neutrality, climate effects and sustainability.
 - Continue to conduct survey annually in the fall. The senior data will be compared to first year data from four years prior to see if students learned more about these topics during their time on campus.
 - Communicate with e-learning students regarding sustainability values on campus and the initiatives currently happening to address those values..
 - Include general science-based facts about greenhouse gases and the impacts they have on the environment and air quality in all events and marketing for the campus community.