SUSTAINABILITY CULTURAL INDICATORS PROGRAM

MONITORING THE CULTURE OF SUSTAINABILITY AT THE UNIVERSITY OF MICHIGAN: WINTER 2018

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This is a Graham Sustainability Institute report and is available at: http://graham.umich.edu/campus/scip

EXECUTIVE SUMMARY

The Sustainability Cultural Indicators Program (SCIP) is a multi-year project designed to measure and track the *culture of sustainability* on the University of Michigan's (U-M) Ann Arbor campus. It is intended to inform U-M administrators and others responsible for day-to-day operations of the University including its academic programs. Furthermore, it is intended to serve as a model demonstrating how behavioral research can be used to address critical environmental issues within universities generally and in other organizational settings. Culture of sustainability is meant to reflect a set of attitudes, behaviors, levels of understanding and commitment, degrees of engagement, and dispositions among a population such as members of a university community.

The findings presented in this report represent the results from 2018 and provide a comparison to results from the last round of data collection (2015) and also from the first round of data collection (2012). Longitudinal findings are also presented from a panel of undergraduate students, which allows for greater understanding of how individual students change over time in terms of their sustainability behaviors, awareness, and attitudes.

The findings are largely descriptive in that all survey responses are reported for the three key groups of the University community - its students, staff, and faculty. Two separate web questionnaires are used for SCIP - one for staff and faculty, and one for students - with questions built around the U-M sustainability goal areas - *Climate Action*, *Waste Prevention*, *Healthy Environments*, and *Community Awareness.* During winter 2018, 4,048 students including a panel of current undergraduate students who first completed the survey as first-year students, 732 staff and 819 faculty participated in the survey representing a 27.2 percent overall response rate. Summaries of key findings, response distribution tables for nearly all questions, and index scores for key indicators are provided in this report. Several key items can be identified when the indicators for 2018 are compared against the results from previous years.

First, there is considerable room for improvements in the pro-environment behaviors, levels of awareness, and degrees of engagement, among members of the University community. Nonetheless, positive changes have occurred over time in individual efforts to reduce waste.

Second, students' mode of travel to and from campus is more in line with the goal of greenhouse gas reduction than the journey to work of staff and faculty. Not surprisingly, students are most likely to walk, bike, or bus to campus. Similarly, students know more than employees about transportation options available to them in Ann Arbor. Yet student understanding of these options has declined over time.

Third, reliance on the automobile in the journey to work of staff has increased since 2012. At the same time, their understanding of alternative transportation options has declined.

Fourth, faculty are more engaged in pro-environmental behaviors than students or staff. These behaviors include reducing waste and purchasing sustainable foods. Faculty members also express a higher degree of commitment to sustainability than staff or students.

Fifth, sustainability engagement outside the University has increased among students, staff, and faculty. More individuals are now voting for candidates with pro-environmental values, donating money to such candidates or to environmental organizations, and volunteering for an environmental organization.

Sixth, seniors participating in the panel of undergraduate students have a greater level of understanding of U-M's sustainability initiatives in 2018 than they did in 2014 and 2015. They also express a greater commitment to sustainability. At the same time, seniors are now more critical of what U-M is doing to create a more sustainable campus.

Seventh, waste prevention practices of undergraduates who entered U-M in 2014 and 2015 have improved over time. Over the same time period, their efforts to conserve energy have declined.

Eighth, staff tend to know more about U-M's sustainability initiatives than either students or faculty. Yet students are more engaged than either staff or faculty in sustainability activities on campus. Engagement on campus for all groups is lower than it was in 2015. Nonetheless, faculty and staff express higher levels of commitment to sustainability than they did in 2012.[1]

Finally, participants in the 2018 survey are more likely to believe that climate change is happening, that it is caused by human activity, and that it is of greater importance to them personally than participants from earlier SCIP surveys.

[1] All student, staff, and faculty indicator scores for 2012, 2013, 2014, 2015 and 2018 are summarized in Appendix Tables E1a and E1b.

Contents

A. INTRODUCTION

This report presents findings from surveys of University of Michigan (U-M) students, staff and faculty conducted during the fifth cycle of data collection (2018) for the Sustainability Cultural Indicators Program (SCIP). SCIP is a multi-year effort designed to measure and track the *culture of sustainability* on the U-M's Ann Arbor campus. It is intended to inform U-M administrators and others responsible for day-to-day operations of the University including its academic programs. Furthermore, it is intended to serve as a model demonstrating how behavioral research can be used to address critical environmental issues within universities generally and in other organizational settings. Culture of sustainability is meant to reflect a set of values, behaviors, levels of understanding and commitment, degrees of engagement, and dispositions among a population such as members of a university community.

The findings cover 2018 results as well as changes that have occurred since SCIP data were first collected in 2012. The findings are largely descriptive in that all survey responses are reported for the three key groups of the University community---its students, faculty, and staff. Demographic, environmental, and other factors that might explain findings have not been fully analyzed and therefore are not covered in this report. The potential for such analyses is great and it is anticipated that much of it will occur in future years as more users of the findings and academic researchers see the richness of the data and opportunities to explore them. From 2012-2015, SCIP questionnaires were administered each fall with analyses covering changes between the current and previous years, and the current and first year. After 2015, SCIP moved to an every other year data collection plan. Initially, data collection in fall 2017 was planned but was shifted to winter 2018 to avoid overlap with another large U-M campus survey initiative on diversity, equity, and inclusion. Moving forward, it is anticipated that SCIP will continue on an every other year data collection plan with the next round of questionnaires distributed in the fall of 2019. Given the several year gap between data collection in 2015 and 2018, the SCIP research team determined that it would be best to use 2015 as the new baseline for comparison, rather than 2012, given the changes to the questionnaires and campus sustainability programs. However, for some questions and indicators, results are also compared to 2012 findings.

Organization of the Report

The report is organized in six sections. Following this introduction, the next section (B) provides a brief overview on the background to SCIP. The third section (C) describes the survey design including the sampling plan and discusses salient characteristics of the respondents. For students, these characteristics include select information about their U-M status such as year in school, where they are from (domestic or international), their housing situation, and their college or school within the U-M. For staff and faculty, information about their job, their place of residence, and their place of employment within the University is presented. Basic demographic information about the respondents is covered in Appendix B.

The fourth section (D) summarizes findings from the winter 2018 surveys. These findings draw from detailed tables showing all survey responses for each undergraduate cohort and graduate students as well as for staff and faculty. The section concludes with a summary of the sustainability indicators characterizing the culture of sustainability at the U-M in 2018 and the changes, if any that have taken place over time. In the next section (E), new SCIP initiatives introduced as part of the 2018 surveys are discussed. The last section (F), addresses ongoing work related to SCIP. Specifically, it outlines plans for current and future analyses of SCIP data and on-going discussions with operational personnel at U-M. It

also discusses efforts aimed at seeing programs similar to the U-M's SCIP replicated at other universities and in organizations and communities. Such programs aimed at changing the culture of sustainability in places and monitoring those changes are seen as critical to addressing complex and pressing environmental issues.

B. BACKGROUND

Campus Sustainability Integrated Assessment

In October 2009, former U-M President Mary Sue Coleman elevated the University's commitment to sustainability in teaching, research, operations, and engagement by creating the U-M Environmental Sustainability Executive Council.[2] One of the first actions of the Council was endorsing a Campus Sustainability Integrated Assessment (CSIA) to analyze the U-M's sustainability efforts to date, benchmark against other institutions, and chart a course for the future through identifying long term goals for sustainable operations on the U-M Ann Arbor campus, including the Athletic Department and the Health System. The CSIA built on a long history of sustainability commitments in U-M campus operations, such as implementing cogeneration technology at the Central Power Plant in the 1960s, adopting the EPA Green Lights and Energy Star programs in the 1990s, and more recently establishing LEED (Leadership in Energy and Environmental Design) Silver certification as the standard for new non-clinical construction projects where the construction value exceeds $10M.

The final CSIA report outlines four high level themes – *Climate Action*, *Waste Prevention*, *Healthy Environments*, and *Community Awareness*. Accompanying the themes are Guiding Principles to direct the U-M's long-range strategy and 2025 Goals that are time-bound and quantifiable.[3] Table 1 provides an overview of the U-M's 2025 Sustainability Goals.

Table 1

CSIA Themes, Guiding Principles, and 2025 Goals

THEME	GUIDING PRINCIPLE	2025 GOALS
Climate Action	We will pursue energy efficiency and fiscally-responsible energy sourcing strategies to reduce greenhouse gas emissions toward long-term carbon neutrality.	Reduce greenhouse gas emissions *(scopes 1&2)* by 25% below 2006 levels. Decrease carbon intensity of passenger trips on U-M transportation options by 30% below 2006 levels.
Waste Prevention	We will pursue purchasing, reuse, recycling, and composting strategies toward long-term waste eradication.	Reduce waste tonnage diverted to disposal facilities by 40% below 2006 levels.

[2] The Council was comprised the University President, the Provost and Executive Vice President for Student Affairs, the Vice Presidents for Research, Student Affairs, Development, and Global Communications & Strategic Initiatives, the Executive Vice President for Medical Affairs, and the Executive Vice President and Chief Financial Officer.

[3] More information on the CSIA process, outcomes, and evaluation can be found at: http://graham.umich.edu/emopps/campus . Information on progress towards the 2025 Climate Action, Waste Prevention, and Healthy Environments goals can be found at: http://sustainability.umich.edu/ocs/goals.

Healthy Environments	We will pursue land and water management, built environment, and product sourcing strategies toward improving the health of ecosystems and communities.	Purchase 20% of U-M food from sustainable sources. Protect Huron River water quality by: • minimizing runoff from impervious surfaces *(outperform uncontrolled surfaces by 30%),* & • reducing the volume of land management chemicals used on campus by 40%
Community Awareness	We will pursue stakeholder engagement, education, and evaluation strategies toward a campus-wide ethic of sustainability.	*There is no goal recommendation for this theme. However, the report recommends investments in multiple actions to educate our community, track behavior, and report progress over time.*

In the fall of 2014, U-M President Mark Schlissel initiated a review of U-M's sustainability goals in three key areas - waste prevention, climate action, and culture. Teams of students, staff, and faculty were charged with reviewing current programs and their impacts on goal progress; identifying a range of options for making significant progress toward the goals, and developing high-level plans for achieving the goals.[4] SCIP results were used to inform the work of the teams and the culture team's report included suggestions for additional ways SCIP results could be used to inform and evaluate campus sustainability efforts.

The Sustainability Cultural Indicators Program

U-M cultural change initiatives stem from the principles outlined under the CSIA theme of Community Awareness. They indicated that the U-M will "pursue evaluation strategies toward a campus-wide ethic of sustainability" as articulated in former President Coleman's September 2011 speech announcing the sustainability goals. Specifically, she stated that "we will scientifically measure and report our progress and behavior as a community…ISR (Institute for Social Research) researchers will measure the sustainability attitudes and activities of students, faculty and staff, as well as identify where we can improve."[5] Combined with the education and leadership development initiatives of the Planet Blue Ambassadors program, the evaluation strategies of the Sustainability Cultural Indicators Program (SCIP) involve a groundbreaking program for monitoring the U-M's progress in moving toward a culture of sustainability.[6] Progress is determined by tracking a set of cultural indicators derived from responses to campus-wide sustainability questionnaires over time.

Two separate questionnaires are used for SCIP - one for staff and faculty, and one for students. While many of the questions are similar, different time frames and sequences are used in the two versions. For example, the staff and faculty survey asks questions within a time frame of the past year while students are asked to answer questions based on their experience since the start of the fall semester. Also, students

[4] Committee reports and recommendations from this effort can be found at: http://sustainability.umich.edu/about/goals
[5] To read former President Coleman's address and other information on the U-M's sustainability goals, please visit: http://sustainability.umich.edu/news/going-green-staying-blue-sustainability-michigan.
[6] For an overview of the Planet Blue Ambassadors Program, please visit: http://graham.umich.edu/campus/pba.

are asked several demographic questions at the start of the survey such as whether they live in campus housing or not in order to skip certain questions which do not apply to students living in campus housing while staff and faculty demographic questions are asked at the end of the survey. In order to retain members of the undergraduate student panel, several questions were eliminated for the student questionnaire so as to shorten the time required to complete it. Most respondents complete the survey in about 15 minutes. As a primary objective of SCIP working closely with the goals of the CSIA, questionnaire modules were developed with questions focusing on transportation, waste prevention, the natural environment, food, climate change, as well as U-M sustainability efforts, and respondent demographics.

Following the release of the first SCIP report in 2012, a program website was developed to share key results and materials.[7] To date, 225 requests have been received for copies of the survey instruments from other institutions in 30 different countries. In the past year, the Association for the Advancement of Sustainability in Higher Education has added a SCIP case study to their campus sustainability hub to promote the instruments to other institutions and the Association of Academic Survey Research Organizations has promoted SCIP to their members as a way to support campus sustainability initiatives at their institutions. Since the inception of SCIP, twelve book chapters & journal articles discussing the program have been published and discussions about SCIP and its findings have been presented at more than a dozen major conferences around the world.

C. 2018 POPULATION AND SAMPLE

Records from the U-M's Office of the Registrar indicate that 46,442 full-time students were enrolled for classes at the Ann Arbor campus in winter 2018. At the same time, the U-M's Human Resources' Information and Data Services report that 8,829 faculty and 37,605 staff were employed at least half-time at the University.

In order to ensure proportional representation from all segment of the University community and from all geographic parts of the Ann Arbor campus, the sample design aimed at obtaining relatively large numbers from the entire student body and from the population of staff and faculty. As in the past, target numbers for 2018 were 1,000 freshmen respondents, 350 respondents from each of the sophomore, junior and senior classes, and 400 graduate student respondents. The sample design also includes a panel of individual undergraduate students who responded to the 2014 and 2015 surveys. That is, the 2018 panels includes 2014 and 2015 freshmen, and the 2015 sophomores. The panel was included in the research design so as to determine if and how the behaviors and views of individual students change during their period of undergraduate study at the University. Finally, a stratified sample was selected by the University's Office of Human Resources with a target of 750 staff and 750 faculty members.[8]

[7] The program website can be found at: http://graham.umich.edu/campus/scip.
[8] See the SCIP methodology report for a more detailed discussion of the sample selection procedure: http://graham.umich.edu/media/files/SCIP_MethodologyReport_2018.pdf.

The actual number of respondents and the response rates are shown in Table 2. The table indicates that the targeted number of participants was exceeded in each cohort except staff.[9] Response rates were similar or somewhat higher than those reported in 2015. Completion of questionnaires was attributable to several factors including the personalized pre-notification email encouraging participation from President Schlissel, and an offer of a possible monetary incentive.[10]

Table 2

NUMBER OF RESPONDENTS AND RESPONSE RATES

2018	Number of Respondents	Response Rates (%)
Students	3054	22.3
Fresh	473	19.2
Soph	1094	24.9
Junior	566	19.8
Senior	484	19.3
Graduate	437	29.2
Staff	732	37.1
Faculty	819	29.9
Student Panel	994	45.9
All Campus	5599	27.2

Weighting

In order to ensure that data reported herein represent accurate estimates for the correct proportions of undergraduate and graduate students and for the staff-faculty ratios, sample weights were developed and applied when analyzing the survey data. These weights are used when reporting data covering *all* students and undergraduate students, and when reporting data for faculty and staff separately and together. Weights take into account not only the true proportion of students from each cohort and the staff to faculty ratio, but also gender and the proportion of University staff and faculty employed within the U-M's health system.

Who are the Student Respondents?

Table 3 presents weighted distributions for several student characteristics. The table indicates that, as in the general student population, graduate student respondents make up nearly a third of the sample. More than a tenth (12 percent) of the respondents are international students with most international students (78 percent) coming from China or other Asian countries. Of the U.S. students, 6 in 10 are from Michigan; nearly two-thirds of them are from Southeast Michigan (Wayne –including Detroit, Oakland, Macomb, and Washtenaw counties).

[9] The relatively large number of sophomores and small number of freshmen reflect the academic classification of students at the time the sample was drawn. That is, there were too few students who were officially classified as freshmen in February 2018. A large number of second semester freshmen had enough academic credits to be classified by the Registrar's Office as sophomores. Therefore, the decision was made to oversample sophomores knowing that a number of them would self-report as freshmen. This, in fact happened and the targeted number of freshmen was reached (see first panel in Table 3).

[10] Calculations of response rates for students are based on their official status as determined by the Registrar's Office rather than the students' self-reported status.

Table 3

STUDENT CHARACTERISTICS

(percentage distribution)*

2018	All Students	Undergraduate Students					Graduate Students
		Fresh	Soph	Junior	Senior	All	
Status (self-report)***							
First-year (Freshmen)	21						
Sophomore	19						
Junior	16						
Senior	15						
Graduate	29						
Total	**100**						
Number of respondents	3058						
U.S.-International Student?							
U.S.	88	96	95	93	95	95	71
International	12	4	5	7	5	5	29
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**
Number of respondents	2932	1212	702	334	263	2513	419
Permanent Residence of U. S. Student [#]							
Michigan							
Wayne, Oakland, Macomb Co (incl. Detroit)	29	34	30	39	33	34	14
Washtenaw Co	10	7	9	13	14	10	9
Other MI Countries MI	20	24	26	21	19	23	12
Great Lakes States (IL,WI,MN,OH,IN,)	10	10	9	8	8	9	14
Northeast (NY,MA,NJ,MD,PA)	15	14	14	11	14	13	18
South (TX,OK,TN,VA,NC,SC,FL,GA,PR)	8	5	5	4	4	5	18
West (CA, OR,WA,AZ,NM,HI,AK)	6	5	5	4	6	5	10
Central West	2	1	2	**	2	1	5
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**
Number of respondents	2591	1120	640	301	240	2302	289
Home Country of International Students							
China (incl. Hong Kong)	35	19	21	57	47	36	35
India	19	23	11	4	8	11	22
Other Asian countries (excl.China & India)	24	35	43	22	29	33	19
European countries	8	6	3	12	0	6	9
Mexico, Latin American, Central America, Caribbean countries	5	8	12	0	8	6	5
Elsewhere (incl. Middle East countries)	9	9	10	5	8	8	10
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**
Number of respondents	235	51	32	24	14	122	113
College/School							
LSA	43	56	53	45	45	51	24
Engineering	26	27	26	27	29	27	24
Ross Business	6	4	6	7	4	5	8
Other colleges/schools (2% each of all students)[a]	9	7	6	5	13	8	13
Other colleges/schools (1% each of all students)[b]	6	4	4	6	3	4	11
Public Health	3	0	**	3	0	0	8
Medicine	2	**	0	0	0	0	5
Dual degree	5	2	5	7	6	5	7
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**
Number of respondents	2940	1219	705	334	263	2523	417

a Includes Schools of Education, Information, Kineseology,Music Theater & Dance, Nursing ,and Social Work.

b Includes Schools and Colleges of Architecture & Urban Planning, Art &Design, Dentistry, Environment & Sustainability (formerly Natural Resources & Environment), Pharmacy,and Public Policy

Major (in LSA & Engineering)							
LSA							
Humanities	10	4	7	16	8	8	20
Natural Sciences	35	32	35	29	40	34	39
Social Sciences	30	18	29	37	38	29	34
Other	14	14	18	17	14	16	7
Undecided	11	32	11	1	0	13	0
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**
Number of respondents	1594	735	431	180	133	1480	114

Table 3 (continued)

STUDENT CHARACTERISTICS

(percentage distribution)*

2018	All Students	Undergraduate Students					Graduate Students
		Fresh	Soph	Junior	Senior	All	
Engineering							
Electrical & Computer Science	32	32	41	39	32	36	22
Mechanical	16	10	15	21	20	16	14
Aerospace	7	8	7	6	8	7	6
Chemical	10	8	7	8	12	9	13
Industrial & Operations	6	6	10	8	8	8	3
Biomedical	6	10	3	2	4	5	9
Materials Science	5	3	4	5	4	4	8
Other	14	6	12	11	12	10	25
Undecided	4	17	1	0	0	5	0
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**
Number of respondents	708	298	146	84	79	607	101

*****The student sample was selected from the population of students listed for each cohort in U-M's Registrar's Office. The proportion of respondents in each class differs slightly from official university records. For instance ,students who said they are juniors may have enough credits to officially classify them as seniors.**

 # Permanent residence is based on the zip code of the student during their last year in high school.

**** Less than one half of one percent.**

*** Percentage distributions are based on the weighted number of respondents to each question. The actual number of respondents for each question differs since not all questions were answered by all respondents.**

As in previous SCIP surveys, student respondents represent all schools and colleges of the University with the majority coming from Literature, Science and the Arts (LSA) or Engineering. Graduate student respondents were more evenly distributed throughout the entire University than undergraduates. Two-thirds of the LSA undergraduate students and nearly three-quarters of the LSA graduate students majored in the social or natural sciences; 13 percent of the LSA undergraduates noted *undecided* when asked about their major. When asked to specify their major, a third of the Engineering undergraduate and a fifth of the graduate students mentioned programs in the Department of Electrical and Computer Science.

In winter 2018, somewhat more than a third of the student respondents lived in U-M housing - a resident hall or Northwood apartments (see Table 4 and Appendix F, Figures F1 and F2).[11] The majority of resident hall students were freshmen and sophomores. Most upper classmen (juniors and seniors) and graduate students said they lived in an off-campus house or apartment. The majority of students (56 percent) moved to their current residence during the previous summer or just prior to the start of the winter semester. Table 4 shows that the proportion of upper classmen who remained in their residence for a year or more increases with each subsequent cohort. Whereas 11 percent of the sophomores had lived in their current residence for a year or more, 26 percent of the juniors and 47 percent of the seniors gave this response. A fifth of the graduate students and 12 percent of the seniors were long-term residents having lived in their current residence for more than 2 years.

The third panel in Table 4 shows that the most frequently named residence halls among freshmen were Bursley on North Campus followed by South Quad, Mary Markley, and West Quad. The table also shows that for students who indicated they lived off-campus, nearly all lived in the Ann Arbor area with

[11] Appendix figures show the number and spatial distribution of resident hall respondents in the Central Campus regions and sub-regions, South Campus, the Health Science sub-region, and the North Campus sub-region. Delineation of regions and sub-regions is discussed more fully in Footnote 12.

Table 4

STUDENT RESIDENTIAL CHARACTERISTICS

(percentage distribution)*

2018	All Students	Undergraduate Students					Graduate Students
		Fresh	Soph	Junior	Senior	All	
Type of Residence							
U-M resident hall	31	95	42	6	4	42	4
Northwood community apartments	6	0	5	4	2	3	12
Off-campus house	21	1	11	35	37	19	28
off-campus apartment	36	3	31	47	46	29	52
Parent's house	2	1	2	4	4	2	1
Other	**	**	**	**	0	**	1
Off-campus housing such as a sorority, fraternity, or co-op.	4	**	9	4	7	5	2
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**
Number of respondents	3058	1259	739	349	270	2619	439
Length of Residence							
Less than 3 months	2	2	2	2	2	2	2
3-11 months	72	96	87	72	51	79	57
1-2 years	16	**	10	18	35	14	21
More than 2 years	10	2	1	8	12	5	20
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**
Number of respondents	3055	1257	738	349	270	2616	439
Residence Hall							
Bursley	12	14	9	17	15	13	0
Baits	6	8	2	3	0	6	0
South Quad	10	13	6	0	0	10	0
Mary Markley	11	16	4	6	0	12	0
West Quad	10	12	6	0	22	10	0
Mosher-Jordan	8	9	5	13	15	8	0
Couzens	7	6	13	5	0	8	0
North Quad	5	0	15	31	26	5	0
Alice Lloyd	5	6	6	0	0	6	5
Stockwell	5	**	16	6	0	5	0
East Quad	8	7	10	7	0	8	0
Munger	4	0	0	0	0	0	95
Other (Barbour, Cambridge, Cook, Fletcher, Henderson, Newberry)	9	9	8	12	22	9	0
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**
Number of respondents	1496	1156	295	21	8	1480	16
Place of Residence(locale)***							
Ann Arbor area	95	99	98	95	96	97	88
Ypsilanti area	2	**	**	2	1	1	5
Other Washtenaw Co. cities, townships, villages	**	0	1	**	1	**	**
Other Michigan cities, townships, villages	3	1	1	3	2	2	6
Elsewhere	**	0	**	0	0	*	1
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**
Number of respondents	2989	1207	730	346	268	2553	436
Number of Household Occupants [#]							
One	12	11	4	5	8	6	23
2-3 persons	42	49	31	31	30	31	60
4-6 persons	32	29	43	44	40	42	15
More than 6 persons	14	11	22	20	22	21	2
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**
Mean Number of Occupants	**5.6**	**6.9**	**10.5**	**5.7**	**7.2**	**7.5**	**2.6**
Median Number of Occupants	**3**	**3**	**4**	**4**	**4**	**4**	**2**
Number of respondents	1385	51	395	312	255	1015	370
Availability of Car in Household							
Yes	42	11	24	45	57	32	67
No	58	89	76	55	43	68	33
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**
Number of respondents	2923	1212	698	333	261	2506	417

[#]Students who reported living in a residence hall or in Northwood apartments were not asked to report number of people in current residence.

***** Residential location based on reported zip code. Students who reported living in a residence hall or in Northwood apartments were not asked to report zip codes. Ann Arbor area zip codes include: 48103, 48104, 48105, 48108, & 48109. Ypsilanti area zip codes include: 48107 and 48108.**

. Less than one half of one percent.**

*** Percentage distributions are based on the weighted number of respondents to each question. The actual number of respondents for each question differs since not all questions were answered by all respondents.**

small percentages commuting to the Ann Arbor campus.[12] Figure 1 shows the places where students lived during the winter 2018. The places are based on responses to a question about the major street intersection near the place of residence. Having roommates was common for students who said they lived off-campus. On average, there were more than 5 persons per household with the median number of persons being 3. Sophomores, many of whom reported living in a fraternity, sorority or co-op (based on open-ended responses), averaged 10.4 people at their place of residence. However, the median number of occupants among sophomore was only 4 persons. Finally, one in 3 undergraduates said there was at least one car in their household. Not surprisingly, two-thirds of the graduate students, many of whom lived relatively far from campus had a car available to them. Table 4 shows that having use of a car increases with each undergraduate cohort.

As part of the questionnaire, students were asked where they had attended most of their classes since the beginning of the winter semester. Nearly three-quarters (72 percent) identified Central Campus with most of the remainder saying North Campus.[13] Freshmen were least likely to mention North Campus (8 percent) while the proportion of juniors and seniors identifying North Campus for most classes was significantly higher (31percent and 34 percent, respectively), (see Table 5). When asked if they spend more than half their time in a particular campus building other than campus housing, nearly two-thirds (63 percent) of the undergraduate students and most (83 percent of the graduate students) responded affirmatively. For those who did so, they were then asked to name the building. As seen in Table 5, students spent considerable time in buildings located throughout campus. The third panel in Table 5 shows that, for undergraduates, the Chemistry building, Duderstadt Center and the Ross Business School building. Graduate student respondents most often mentioned the Ross Business School building.

The buildings identified have been grouped together for analytical purposes by campus, regions within the campuses, and sub-regions.[14] These places are shown in Figure 2. The groupings also enable U-M officials working in areas related to energy conservation, transportation, recycling, property maintenance, etc. to better understand (and hopefully use) responses of building occupants (students, faculty, and staff) associated with different parts of the campus. Groupings of buildings mentioned by students are shown by Campus, Region and Sub-Region in panels 4, 5, and 6 of Table 5. The panels reveal that, for students who identified a building where they spent more than half time, most were either in the southwestern part of the Central Campus (i.e. Ross Business School, Michigan Union, Social Work, Hutchins Hall, etc.), the northern sub-region of North Campus (i.e. Duderstadt Center, College of Engineering buildings, Pierpont Commons, etc.), and the southeastern part of Central Campus (i.e. Chemistry, Natural Science, East Hall, etc.).[15] For the most part, the distribution of respondents parallels that of the 2015 student respondents with the largest number of respondents attending classes in the Central Campus-West Region followed by the North Campus-North Sub-Region.

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[12] Students living off-campus were asked, "What is the zip code of your current residence?" Ann Arbor area zip codes include: 48103, 48104, 48105, 48108, and 48109. Ypsilanti area zip codes are 48197 and 48198.

[13] Of the students who said their classes were elsewhere, several mentioned the medical campus or noted that they were in an off-campus location including overseas for the semester.

[14] Regions are delineations of the Central Campus and the Medical Campus created as maintenance zones by the U-M's Planet Blue Operations Team. Sub-regions have been delineated by the SCIP team based on either number of respondents to either the student questionnaire or the faculty questionnaire. Planet Blue Operations Team had separated selected medical and other buildings from the U-M's Medical Center and parts of Central Campus to create a Health Sciences Region. The Ross Athletic Campus was formerly referred to as South Campus.

[15] See Appendix F, Figures F3 and F4 for the numbers and spatial distribution student respondents by building, campus region, and sub-region.

Figure 1

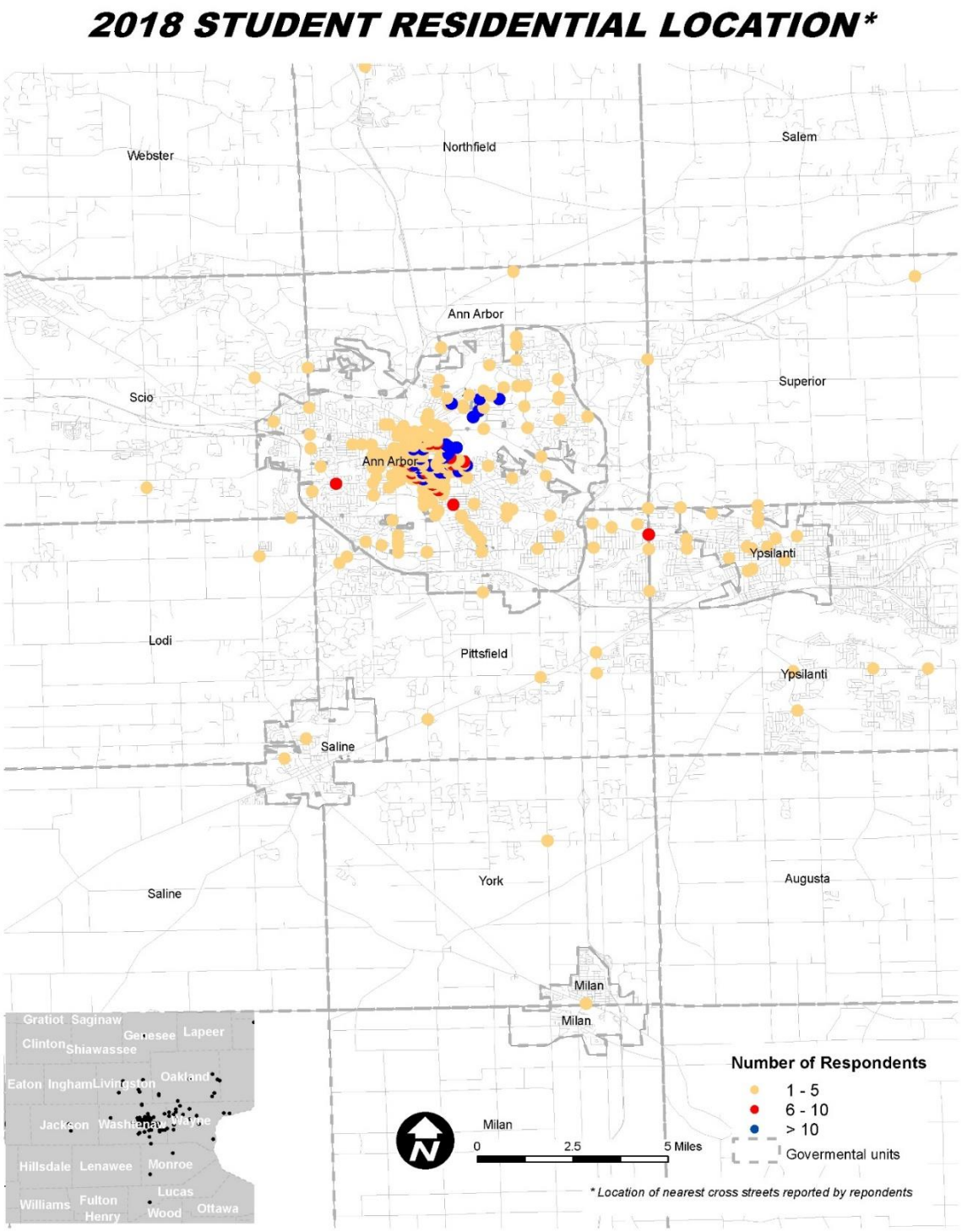

2018 STUDENT RESIDENTIAL LOCATION*
Webster
Northfield
Salem
Ann Arbor
Scio
Superior
Ann Arbor
Ypsilanti
Lodi
Pittsfield
Ypsilanti
Saline
Saline
York
Augusta
Milan
Milan
Gratiot
Saginaw
Genesee
Lapeer
Clinton
Shiawassee
Eaton
Ingham
Livingston
Oakland
Jackson
Washtenaw
Wayne
Hillsdale
Lenawee
Monroe
Williams
Fulton
Henry
Lucas
Wood
Ottawa
Milan
0
2.5
5 Miles
Number of Respondents
1 - 5
6 - 10
> 10
Govermental units
* Location of nearest cross streets reported by repondents

Figure 2

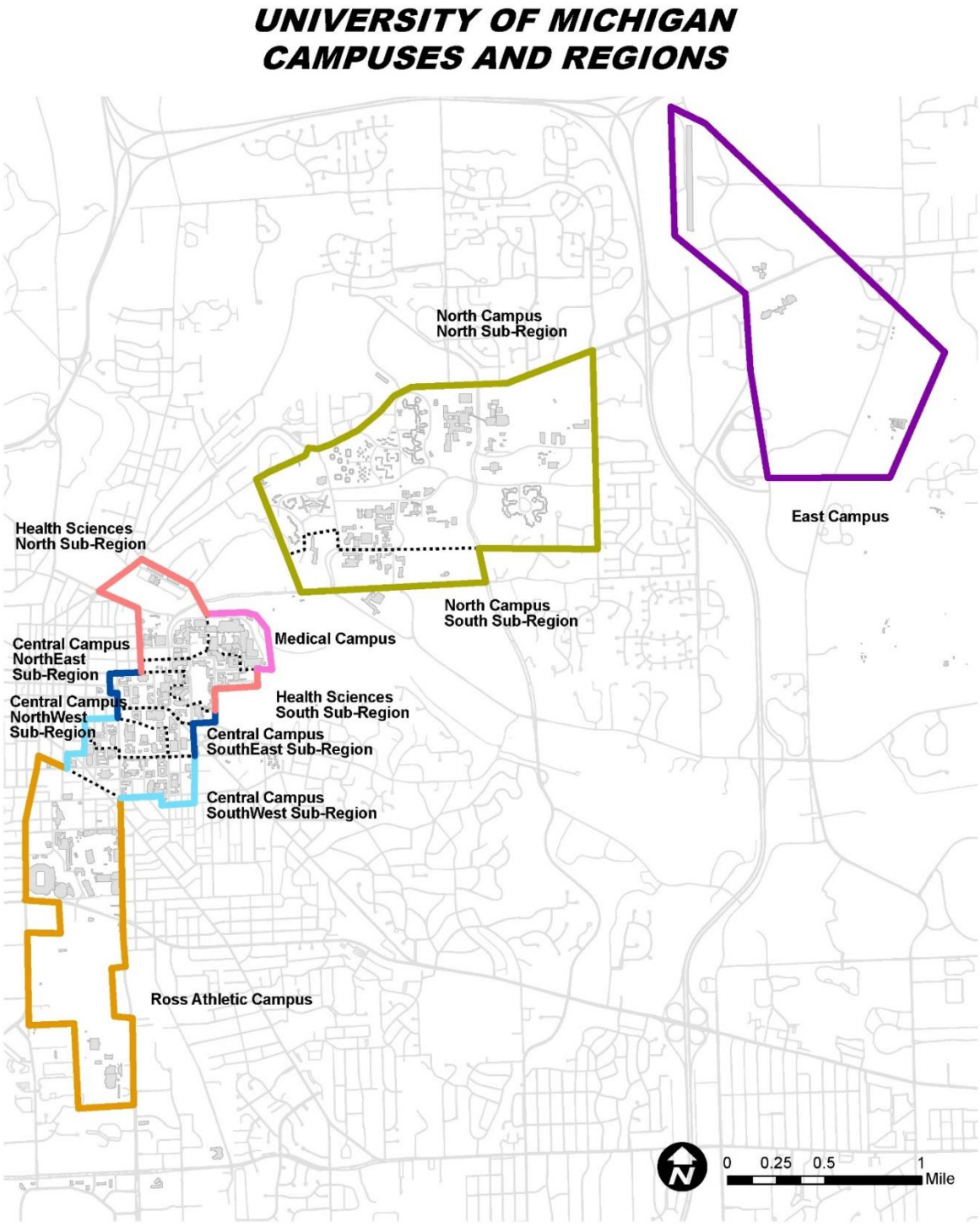

UNIVERSITY OF MICHIGAN
CAMPUSES AND REGIONS
North Campus
North Sub-Region
East Campus
Health Sciences
North Sub-Region
North Campus
South Sub-Region
Central Campus
NorthEast
Sub-Region
Medical Campus
Central Campus
NorthWest
Sub-Region
Health Sciences
South Sub-Region
Central Campus
SouthEast Sub-Region
Central Campus
SouthWest Sub-Region
Ross Athletic Campus
N
0 0.25 0.5 1
Mile

Table 5

STUDENT CLASS/STUDY LOCATIONAL CHARACTERISTICS

(percentage distribution)*

2018	All Students	Undergraduate Students					Graduate Students
		Fresh	Soph	Junior	Senior	All	
Location of Most Classes (self-reports)							
Central Campus	72	91	75	68	65	76	64
North Campus	25	8	24	31	34	23	30
Elsewhere	3	1	1	1	1	1	6
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**
Number of respondents	2940	1217	704	334	263	2520	420
R spends more than half time in non-residential building?							
No	49	73	67	54	51	63	17
Yes	51	27	33	46	49	37	83
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**
Number of respondents	2934	1214	702	333	263	2514	420
Building (non-resid) where R spent most time							
Chemistry	6	11	10	5	6	7	4
Duderstadt Center	4	3	5	7	8	6	2
Ross (School of Business)	10	4	15	15	3	11	9
GG Brown	4	0	3	8	5	5	4
East Hall	4	1	8	4	7	4	5
School of Public Health	4	0	0	4	0	1	7
Other bldgs (less than 4%)a	14	23	19	22	3	22	6
Other bldgs (less than 3%)b	19	22	15	15	31	17	21
Other bldgs (less than 2%)c	17	9	8	11	23	10	25
Other bldgs (less than 1%)d	18	27	17	9	14	17	17
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**
Number of respondents	1229	340	256	159	301	883	346
Location of Building where R spent most time (Campus)***							
Central Campus	56	64	67	59	50	60	52
North Campus	29	20	22	32	36	28	30
Medical Campus (including Health Sciences)	14	14	8	8	11	10	18
Ross Athletic Campus (South Campus)	1	2	3	1	3	2	**
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**
Number of respondents	1229	340	256	159	127	883	346
Location of Building where R spent most time (Region)***							
Central Campus-West Region	37	47	40	40	36	41	33
Central Campus-East Region	19	17	27	19	14	19	19
Health Sciences Region	13	14	8	7	8	9	18
Medical Campus	1	0	**	1	3	1	**
North Campus	29	20	22	32	36	28	30
Ross Athletic Campus (South Campus)	1	2	3	1	3	2	**
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**
Number of respondents	1229	340	256	159	127	883	346

Table 5 (continued)

STUDENT CLASS/STUDY LOCATIONAL CHARACTERISTICS

(percentage distribution)*

2018	All Students	Undergraduate Students					Graduate Students
		Fresh	Soph	Junior	Senior	All	
Location of Building where R spent most time (Sub-Region)							
Central Campus-Southwest	20	18	20	21	14	18	23
Central Campus-Northwest	17	29	20	19	23	23	10
Central Campus-Southeast	13	13	21	12	10	13	12
Central Campus-Northeast	6	4	7	8	4	6	6
Health Sciences- South	8	10	3	4	3	5	12
Health Sciences-North	5	4	5	3	4	4	7
Medical Campus	1	0	**	1	3	1	**
North Campus-North	23	7	15	28	34	22	24
North Campus-South	6	13	6	3	2	6	6
Ross Athletic Campus (South Campus)	1	2	3	1	3	2	**
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**
Number of respondents	1229	340	256	159	127	883	346
Distance between Residence & Campus (sub-region of building where R spends most time)							
Less than .125 mi	2	7	2	3	2	4	**
.125-.249 mi	6	19	8	9	6	10	2
.25-.49 mi	26	26	45	36	28	34	17
.5-..99 mi	22	29	21	17	19	21	24
1.0-.1.99 mi	22	16	15	17	21	17	28
2.0-3.99 mi	14	2	7	14	16	10	17
4.0-5.99 mi	2	0	1	0	2	1	4
6.0 mi. or more	6	1	1	4	6	3	8
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**
Mean Distance (Miles)	**2.5**	**0.8**	**1**	**1.5**	**3.9**	**1.4**	**3.7**
Median Distance (Miles)	**0.8**	**0.5**	**0.5**	**0.6**	**0.8**	**0.5**	**1.2**
Number of respondents	1135	328	233	145	117	824	311
Distance between Residence & Building (where R spends most time)							
Less than .125 mi	4	16	4	4	5	7	1
.125-.249 mi	7	12	13	12	7	11	2
.25-.49 mi	25	32	42	31	23	32	18
.5-..99 mi	21	22	18	17	22	20	23
1.0-.1.99 mi	25	16	18	25	26	21	29
2.0-3.99 mi	10	1	3	7	9	5	15
4.0-5.99 mi	2	0	1	0	2	1	4
6.0 mi. or more	6	1	1	4	6	3	8
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**
Mean Distance (Miles)	**2.4**	**0.7**	**0.8**	**1.4**	**3.8**	**1.3**	**3.7**
Median Distance (Miles)	**0.7**	**0.4**	**0.4**	**0.5**	**0.8**	**1.3**	**1.3**
Number of respondents	1136	328	233	144	117	824	312

[a] Includes Angel Hall, Shapiro Library, Mason Hall, North Quad.

[b] Includes Social Work, Art & Arch, Education, Moore EECS, FXB, Nursing, Grad Library.

[c] Includes MSRB, West Hall, HH Dow, Beyster, NCRC, Dana, MLB, Space Research, Union, Lorch, Weill, IOE.

[d] Includes BSRS, Taubman Library, CC Little, East Quad, South Quad, Randall, ERB, LSI.

*** Percentage distributions are based on the weighted number of respondents to each item. The actual number of respondents for each differs since not all questions were answered by all respondents. The number of respondents for the building and distance measures reflects non-responses to questions asking where R lives, the building where R spends more than half time, or both.**

**** Less than one half of one percent.**

*****No student respondents spent more than half time on East Campus.**

The identification of specific University buildings where students spend more than half their time (and the corresponding region and sub-region) together with the student residential location provide a good approximation of the distance traveled between residence and campus.[16] The last two panels in Table 5 show the how far students travel from their home to campus (sub-region and building). Students who identified a building where they spent more than half of their time while on campus and provided residential information traveled on average 2.4 miles. Undergraduates many or whom live in residence halls traveled less (1.3 miles). Graduate students tend to have longer trips to campus traveling 3.7 miles on average.

The demographic makeup of the 2018 student respondents was identical to the makeup of respondents in the earlier SCIP surveys. They were nearly equally divided between female and male and undergraduates were 20 years old on average while the mean age of graduate students was 27 (see Appendix B, Table B1).

Who are the Staff and Faculty Respondents?

Table 6 presents employee characteristics of the staff and faculty who responded to the 2018 survey. More than half of the former indicated they were in professional, administrative, or managerial positions and one in 5 said they were either a nurse or member of the medical staff. About 4 in 10 staff respondents (39 percent) had worked at U-M for more than 10 years and a quarter (24 percent) had been employed by the U-M for 2 years or less.

[16] For students living in residence halls, the precise location of their place of residence is known. For students living elsewhere, they were asked the zip code and the nearest major street intersection of their place of residence. Because travel routes can vary greatly between any two points depending on mode of travel, straight-line distances between the two points were calculated. Distance measures are only available for students who a) said they spent more than half of their time in a University building and named the building, and b) identified their zip code and major street intersection near home.

Table 6

STAFF/FACULTY EMPLOYEE CHARACTERISTICS

(percentage distribution)*

2018	Staff	Faculty
Type of Staff		
Professional	22	
Managerial	13	
Administrative	19	
Research	12	
Medical, Nursing	25	
Service	3	
Other	6	
Total	**100**	
Type of Faculty		
Teaching- Tenured		21
Teaching-Non-tenured		5
Research- Tenured		15
Research-Non-tenured		19
Clinical instructional- Tenured		3
Clinical instructional-Non-tenured		20
Lecturer		9
Other		8
Total		**100**
Years at U-M		
Less than a year	9	8
1-2 years	15	8
3-5 years	18	14
6-10 years	19	19
11-20 years	22	26
More than 20 years	17	25
Total	**100**	**100**
*** Percentage distributions are based on the weighted number of respondents to each question. The actual number differs since not all questions were answered by all respondents. The minimum number of respondents for faculty and staff is shown**		
Number of respondents	**705**	**731**

Among the faculty respondents, nearly half were affiliated the University for a more than 10 years whereas 16 percent had been employed for 2 years or less. About a quarter identified themselves as teaching faculty although a number also mentioned their role as researchers. An additional 1 in 5 were clinical instructors and 9 percent of the faculty respondents were lecturers. Thirty-four percent of them said they were primarily researchers and 4 in 10 faculty respondents were tenured.

As seen in Table 7, faculty members, on average, were three times as likely to live in the Ann Arbor area as staff (77 percent versus 28 percent).[17] In fact, nearly half of the staff respondents said they lived

[17] The Ann Arbor area includes the following zip codes: 48103, 48104, 48105, 48108, and 48109. Ypsilanti area zip codes are 48197 and 48198.

outside of Washtenaw County. Places of residence of staff and faculty respondents are shown in Figures 3 and 4, respectively. It should be noted that the proportion of staff living in the Ann Arbor area was considerably higher at the time of initial SCIP survey in 2012---40 percent. Similarly, nearly half of the staff reported living outside of Washtenaw County compared to 38 percent in the 2012 survey. Not surprisingly, the number of cars for staff respondents increased from 2.1 on average in 2012 to 2.4 in 2018. In terms of the number of households with 3 or more vehicles, staff outnumber faculty by more than 2 to 1 (30 percent versus 14 percent).

Table 7

STAFF/FACULTY RESIDENTIAL CHARACTERISTICS

(percentage distribution)*

2018	**Staff**	**Faculty**
Place of Residence(locale)***		
Ann Arbor area	28	77
Ypsilanti area	12	5
Other Washtenaw Co. cities, townships, villages	13	9
Other Michigan cities, townships, villages	46	9
Elsewhere	1	**
Total	**100**	**100**
Number of Cars in Household		
None	1	3
One	21	28
Two	48	55
Three	19	11
Four or more	11	3
Total	**100**	**100**
Mean Number of Cars in HH	**2.4**	**1.9**

*****Location of residence is based on the respondents' reported zip code and the nearest major street intersection. Figures cover unweighted data.**

**** Less than one half of one percent**

*** Percentage distributions are based on the weighted number of respondents to each question. The actual number of respondents for each differs since not all questions were answered by all respondents. The minimum number of respondents for faculty and staff is shown below.**

Number of respondents	**668**	**708**

Figure 3

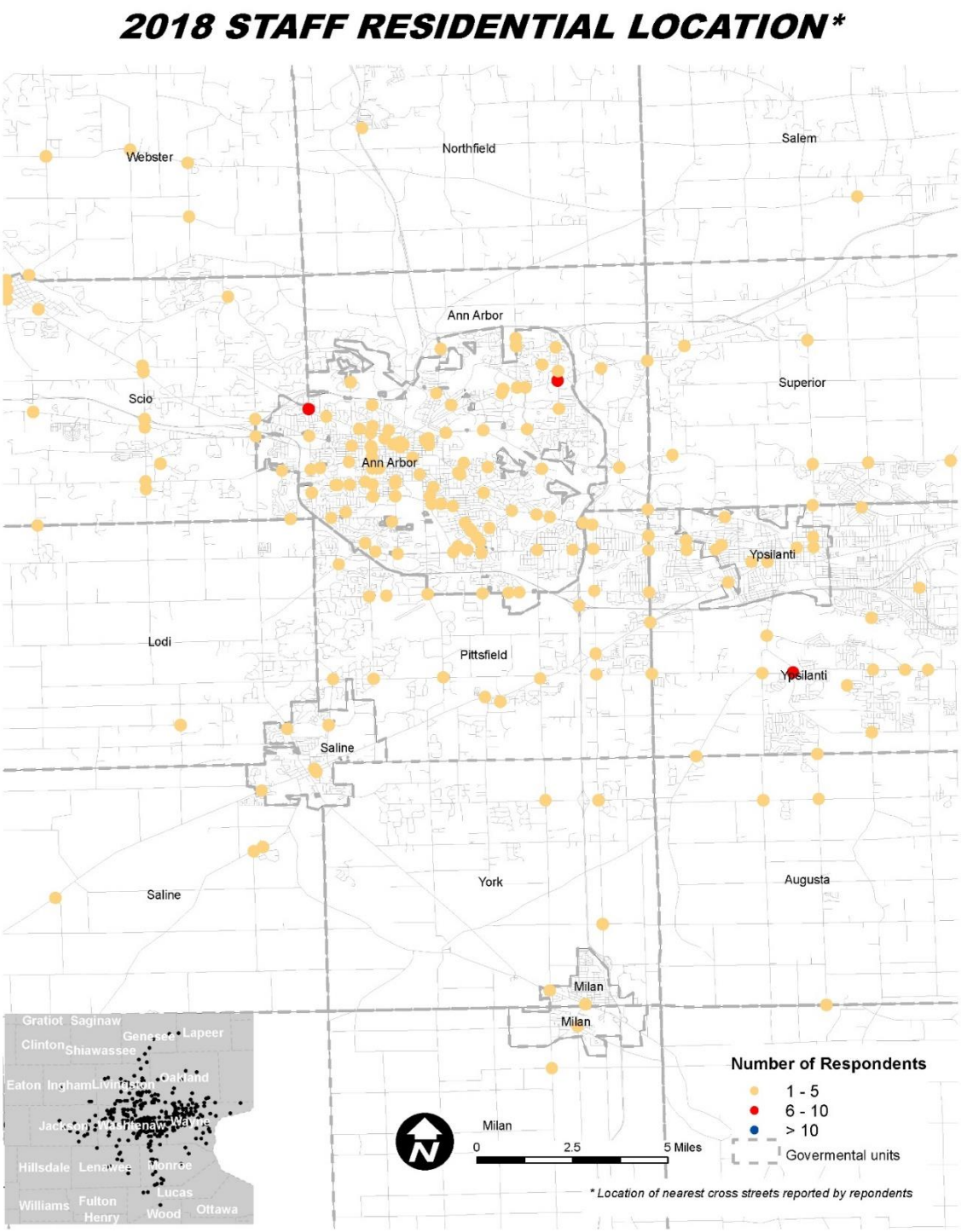
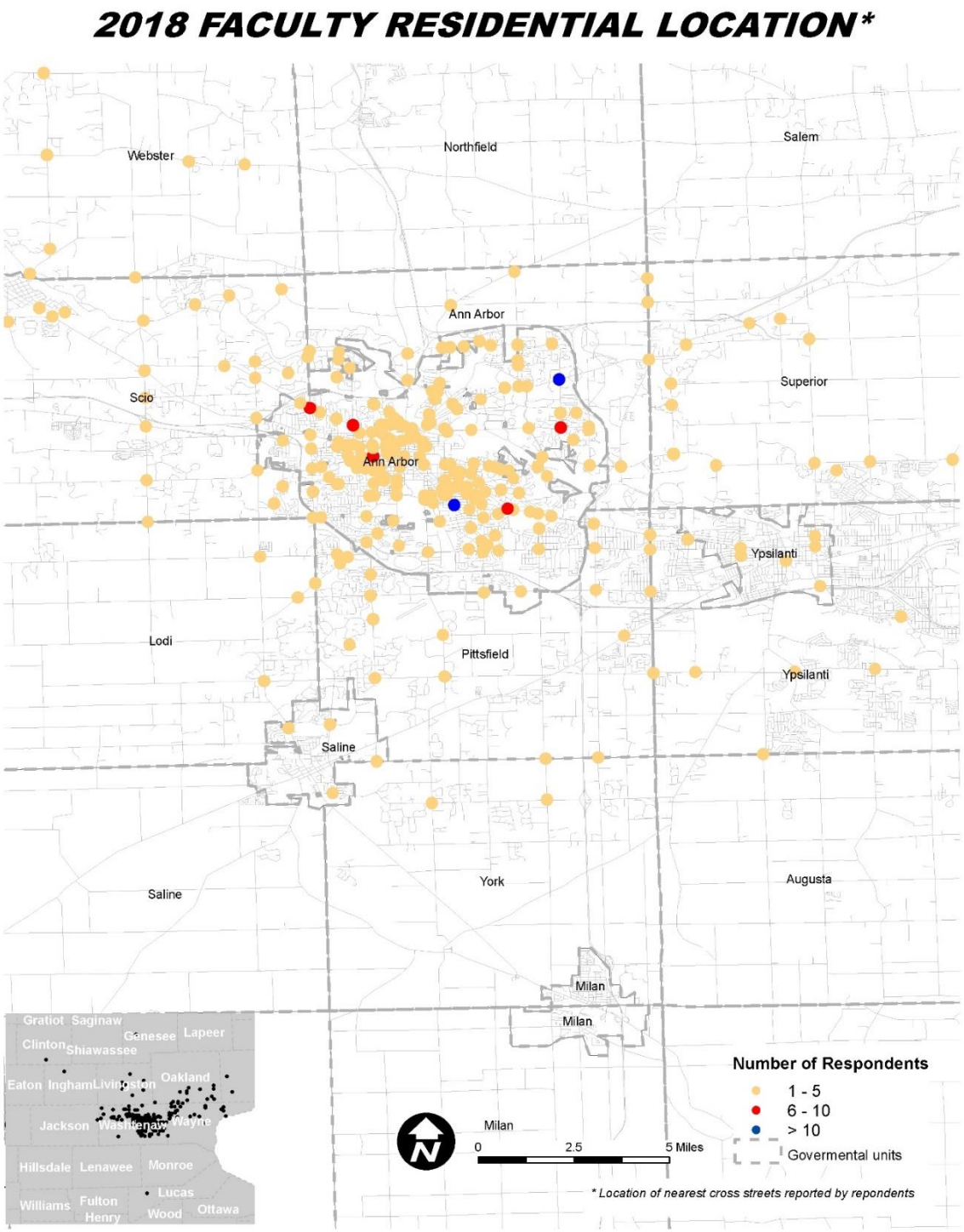

2018 STAFF RESIDENTIAL LOCATION*
Webster
Northfield
Salem
Ann Arbor
Scio
Superior
Ann Arbor
Ypsilanti
Lodi
Pittsfield
Ypsilanti
Saline
Saline
York
Augusta
Milan
Milan
Gratiot
Saginaw
Clinton
Shiawassee
Genesee
Lapeer
Eaton
Ingham
Livingston
Oakland
Jackson
Washtenaw
Wayne
Hillsdale
Lenawee
Monroe
Williams
Fulton
Henry
Lucas
Wood
Ottawa
Milan
0
2.5
5 Miles
Number of Respondents
1 - 5
6 - 10
> 10
Govermental units
* Location of nearest cross streets reported by repondents

Figure 4


2018 FACULTY RESIDENTIAL LOCATION*
Webster
Northfield
Salem
Ann Arbor
Scio
Superior
Ann Arbor
Ypsilanti
Lodi
Pittsfield
Ypsilanti
Saline
Saline
York
Augusta
Milan
Milan
Gratiot
Saginaw
Genesee
Lapeer
Clinton
Shiawassee
Eaton
Ingham
Oakland
Jackson
Wayne
Hillsdale
Lenawee
Monroe
Lucas
Williams
Fulton
Henry
Wood
Ottawa
Milan
0
2.5
5 Miles
Number of Respondents
1 - 5
6 - 10
> 10
Govermental units
* Location of nearest cross streets reported by repondents

As in previous surveys, faculty and staff were also asked about the building on campus where they most often worked. Data for the places of employment are shown in Table 8 and cover buildings and the campus, region, and sub-region where those buildings are located.

The first panel shows that while more respondents worked at the University Hospital than in any other single building on campus, staff and faculty respondents were distributed widely throughout the entire University. This is clearly demonstrated in the second panel where 40 percent of the faculty respondents and 14 percent of the staff respondents worked on Central Campus. Significant numbers of both groups also worked on North Campus whereas fewer respondents worked in the less populated Ross Athletic Campus (formerly South Campus) and East Campus. Finally, 9 percent of the staff respondents and one percent of faculty respondents worked off-campus in University-owned or leased space near Central Campus, North Campus, or near Briarwood (i.e. Wolverine Tower).[18]

The identification of specific University buildings where staff and faculty worked and their corresponding campus, region and sub-region was used together with their residential location in measuring the distance between residence and campus.[19] The last two panels in Table 8 show the how far the staff and faculty travel from their place of residence to campus (sub-region and building).

Data from the 2018 sample show that on average, staff travel nearly 3 times as far as faculty in their journey to work (13.2 miles versus 5.4 miles). Whereas a quarter of the staff members live within 4 miles of campus, two-thirds of the faculty travel this relatively short distance. In contrast, staff respondents are 4 times more likely than faculty to commute more than 15 miles to the University (37 percent versus 8 percent).

[18] Appendix F, Figures F5 and F6 show the number and spatial distribution of staff/faculty respondents in buildings, campuses, regions, and sub-regions.

[19] Faculty and staff were asked the zip code and the nearest major street intersection of their place of residence. Because travel routes can vary greatly between any two points depending on mode of travel, straight-line distances between the two points were calculated. As in the case of students, distance measures are only available for respondents who gave complete locational information. For staff and faculty, that information was a) the name of the University building where they worked, and b) the zip code and major intersection near their place of residence.

Table 8

STAFF/FACULTY
WORK LOCATION CHARACTERISTICS

(percentage distribution)*

2018	Staff	Faculty
Location of Work (Building)		
University Hospital	20	7
Mott Children's Hospital	13	5
North Campus Research Complex	5	5
Biomedical Science Research Building (BSRB)	2	4
Medical Science Unit (Med Sci)	2	4
Taubman Bioscience	3	2
Medical Science Research	1	4
Institute for Social Research	1	3
Other U-M owned or leased buildings***	53	66
Total	**100**	**100**
Location of Work (Campus)		
Central Campus	14	40
North Campus	10	17
Medical Campus (including Health Sciences)	56	39
Ross Athletic Campus (South Campus)	4	**
East Campus	7	3
Elsewhere	9	1
Total	**100**	**100**
Location of Work (Region)		
Central Campus-East	5	18
Central Campus-West	9	22
Health Sciences	12	21
Medical Campus	44	17
North Campus	10	18
Ross Athletic Campus (South Campus)	4	**
East Campus	7	3
Elsewhere	9	1
Total	**100**	**100**

Table 8 (continued)

STAFF/FACULTY WORK LOCATION CHARACTERISTICS

(percentage distribution)*

2018	Staff	Faculty
Location of Work (Sub-Region)		
Central Campus-Northeast	3	10
Central Campus-Southeast	2	8
Central Campus-Northwest	6	15
Central Campus-Southwest	4	7
Health Sciences- South	4	8
Health Sciences-North	8	14
Medical Campus	44	17
North Campus-North	9	13
North Campus-South	1	5
Ross Athletic Campus (South Campus)	4	**
East Campus	7	2
Elsewhere	8	1
Total	**100**	**100**
Number of respondents	618	699
Distance between Residence & Campus (location of work: Sub-Region)		
Less than 1 mi	3	10
1.0-1.99 mi	5	29
2.0-3.99 mi	15	29
4.0-5.99 mi	9	11
6.0-9.99 mi	15	10
10-14,99 mi	16	4
15-19.99 mi	13	2
20 mi. or more	24	5
Total	**100**	**100**
Mean Distance (miles)	**13.2**	**5.4**
Median Distance (miles)	**10.9**	**2.8**
Number of respondents	438	547
Distance between Residence & Building (where R works)		
Less than 1 mi	4	12
1.0-1.99 mi	5	27
2.0-3.99 mi	14	28
4.0-5.99 mi	10	11
6.0-9.99 mi	14	10
10-14,99 mi	16	4
15-19.99 mi	14	3
20 mi. or more	23	5
Total	**100**	**100**
Mean Distance (miles)	**13.2**	**5.5**
Median Distance (miles)	**10.9**	**3.0**
Number of respondents	486	553

*** Percentage distributions are based on the weighted number of respondents to each item. The actual number of respondents for each differs since not all questions were answered by all respondents. The number of respondents for the building and distance measures reflects non-responses to questions asking where R lives, the building where R works, or both.**

**** Less than one half of one percent.**

*****Other U-M owned or leased buildings are those having 2 percent or less of all staff and faculty respondents.**

Demographically, staff respondents were more likely to be female and younger than male respondents. Faculty respondents on the other hand, were more likely to be male and older than staff. A significant number of staff members were college graduates or had a graduate or professional degree whereas nearly all the faculty had either graduate or a professional training (see Appendix B, Table B2).

D. 2018 FINDINGS

Section B reviewed the U-M's established goals for 2025 under the themes of *Climate Action*, *Waste Prevention*, and *Healthy Environments*. A fourth goal discussed was creating and enhancing a culture of sustainability on campus under the theme, *Community Awareness*. That is, the University would strive to raise the level of awareness about all aspects of sustainability through various programs and other initiatives targeting its students, faculty and staff.[20] The SCIP surveys conducted since 2012 are designed in part to measure movement toward this fourth goal[21]

As in previous SCIP reports, findings for the Year 5 assessment are organized around these four themes and are presented in two ways. First, selected findings from the winter 2018 survey within each thematic area are discussed along with changes, if any, that occurred in survey responses from the baseline year (2012) and 2015.[22] Second, Sustainability Indicator scores are then presented covering Year 5 as well as the degree to which they differ from previous indicator scores.[23] Whether or not there are changes in responses to individual questions and the indicator scores reflect the extent to which the culture of sustainability on campus has changed. Furthermore, the amount of change in any score, should it occur, indicates the magnitude of shift toward a sustainability culture. In addition to considering scores for cohorts of students, staff, and faculty, cultural change is examined for individual undergraduate students. These individuals constitute a panel of students that completed the SCIP survey in previous years.

[20] For discussions of efforts to raise awareness about sustainability, see Shriberg et.al, 2013; Shriberg and MacDonald, 2013; and Marans, Shriberg, and Callewaert, 2014.

[21] Another key purpose of SCIP is to inform the University's leadership and Plant Operations personnel about the effectiveness of their sustainability initiatives.

[22] Key findings covering the 2018 questionnaires are drawn from the 13 tables in Appendix C. The tables show the percentage distributions to all survey questions (except those shown in Section C of this report dealing with the Population and Sample). Percentage distributions cover all staff, faculty and students as well as differential responses among different student cohorts ranging from freshmen to graduate students. The tables largely follow the organization and question-sequencing within the questionnaires. That is, they address Travel and Transportation, Waste Prevention and Conservation, Sustainable Foods, Climate Change, Sustainability Engagement, and the U-M's Sustainability Initiatives. Within the first four topics, tables are organized by the sequence of questions covering *awareness*, *behavior*, and *other* questions. Miscellaneous questions addressing behaviors and opinions are covered in the last table. Distributions of responses to individual questions asked each year are available in a multiyear composite working document and can be found on the SCIP website under SCIP Materials. See http://graham.umich.edu/leadership/scip.

[23] Sustainability Indicators are composite measures derived from two or more survey questions about a topic or concept. In a few instances, an indicator consists of a single question. We have referred to indicators associated with the themes of Climate Action, Waste Prevention, Healthy Environments, and Community Awareness as primary while the remaining indicators are noted as secondary. Nonetheless, all indicators are viewed as important in defining the culture of sustainability. For a discussion of procedures and items used to create sustainability indicators, see Appendix D.

Climate Action

Prior to discussing the actions being taken by students, faculty and staff in dealing with greenhouse gas reductions, consideration is given to their thoughts about and understanding of climate change. In 2013, a new set of questions was asked to determine how the U-M community compares to the population of the U. S. as a whole.[24]

As in previous SCIP surveys, most U-M respondents believe that climate change is real. Whereas more than 9 in 10 said that climate change *is happening*, 7 in 10 Americans responded in this manner.[25] A relatively small proportion of the U-M community expressed uncertainty. When asked whether climate change was happening, just 3 percent of the students, 2 percent of the faculty, and 9 percent of the staff said they "don't know".

For respondents who believed in climate change, they were asked how sure they were that change was happening. Nearly all students and faculty (96 percent and 97 percent, respectively) said they were "extremely sure" or "mostly sure" climate change was occurring. Respondents in the national sample were not as convinced as the U-M respondents; just half of the Americans who believe in climate change indicated they were extremely or very sure it is happening.

Two-thirds of the faculty participants think that climate change is caused mostly by human activity while the remaining think it is caused by both human activity and natural causes. Among students, more than half (56 percent) said it caused by human activity, a proportion comparable to the 2018 national figures.[26] Staff members were least likely to believe climate change is caused mostly by human activity; 39 percent gave this response.

Members of the university community were of mixed minds when asked about the importance of climate change to them personally. For faculty, three quarters said climate change was "extremely important" or "very important" while just 4 percent said it was "not too important" or "not at all important". Students on the other hand had mixed views; more than half (61 percent) said climate chance was "extremely important" or "very important", whereas 10 percent said it was "not at all important" or "not too important". Feelings were also mixed among staff; 56 percent said it was "extremely important" or "very important" and 11 percent said it was "not too important" or "not at all important".

In order to determine how much they know about climate change, U-M respondents were asked "How well could you explain climate change to someone?" Significant numbers of faculty, students, and staff believe they understand the issue. About three-quarters of both students and faculty respondents said they could explain climate change "very well" or "fairly well" while half of the staff gave these responses.

How have views on climate change changed over the years? While the number of U-M survey participants who believe climate change is happening has moderately increased since the question was

[24]Selected questions were drawn from a 2013 national survey conducted by the Yale Project on Climate Change Communication. They most recent Yale survey conducted in early 2018 offers comparative data for this report. See Leiserowitz, A., Maibach, E., Roser-Renouf, C., & Rosenthal, S., Cultler, S. & J. Kotcher. 2018

[25] Yale's national survey uses the term "global warming" instead of "climate change". We acknowledge the scientific difference but the literature suggests that attitudes and beliefs between the two concepts are slight (see Benjamin, Por, & Budescu, 2017)

[26] Climate Change is the American Mind reports that 58 percent of the respondents believe that climate change is caused mostly by human activities. The report shows that in 2012, slightly fewer Americans (54 percent) gave this response.

first asked in 2013, the changes in the proportion of participants who are "extremely sure" it's happening have increased dramatically. For students, 60 percent gave this response in the 2013 survey whereas 77 percent did so the current survey. Comparable changes also occur among staff and faculty respondents. Staff who were "extremely sure" increased from 47 percent to 63 percent and faculty members who gave this response increased from 75 percent in 2013 to 84 percent in 2018.

Finally, significant changes have occurred in the degree to which climate change is viewed important to members of the University community. Whereas half of the students (54 percent) in 2012 said that climate change was "extremely important" or "very important" to them personally, 6 in ten (61 percent) of the 2018 students gave these responses. Staff giving these responses increased from 45 percent to 56 percent over the same period while faculty responses increased from 67 percent in 2012 to 79 percent in 2018.

Similarly, the proportion of U-M students who believe they understand climate change increased between 2012 and 2018. When asked how well they could explain climate change to someone, the proportion of students who said "very well" or 'fairly well" increased from 65 percent in 2012 to 77 percent in 2018. Minor but insignificant improvements in understanding climate change were also reported among staff and faculty.

Students who participated in the panel were more likely to think that climate change was caused mostly by human activity in 2018 than they were in 2014 (59 percent versus 34 percent).

Finally, members of the university community were of mixed minds when asked about the importance of climate change to them personally. For faculty, two-thirds said climate change was "extremely important" or "very important" while just 4 percent said it was "not too important" or "not at all important". Students were somewhat more divided in their views; Six in 10 (61 percent) said climate chance was "extremely important" or "very important", significantly up from 44 percent in 2012 ($p<.01$). At the same time just one in 10 said it was "not at all important" or "not too important". For staff, the feelings were also mixed; 56 percent said it was "extremely important" or "very important" and 8 percent said it was "not too important" or "not at all important".

Despite strong beliefs in climate change and feelings among many that human activity is its main cause, faculty, staff, and students varied in the manner in which they act to address the challenge. Whereas significant numbers make efforts to decrease their carbon footprint, others do not. For example, 9 in 10 faculty respondent (89 percent) said they "always" turned off the lights when leaving their work place. Yet more than 7 in 10 (74 percent) regularly drive to and from work. Similarly, 88 percent of the students reported turning off lights when leaving a room and 7 in 10 "never" or "rarely" drive a car and park on campus. Yet less than half (42 percent) of the students living off-campus adjust their thermostats to conserve energy during cold or hot weather months.

In one item addressing efforts to conserve energy, a significant and positive change was identified. In 2018, a third of the faculty and staff members reported using a motion sensor/"smart" power strip at work "sometimes" or "always/most of the time". This is an increase from the 2012 data where a quarter of both groups gave these responses.

In 2014, new questions of interest to U-M Plant Operations were added to the faculty-staff questionnaire. One asked University employees, "How important is your behavior to conserving energy in the building where you work?" For both the 2018 staff and faculty respondents, 4 in 10 said it was "very important" whereas somewhat more than one in 10 said their behavior was 'not that important" or "not important at all" to conserving building energy.[27] These findings were consistent with those reported in previous years.

Travel behavior among staff and faculty continues to be a source of greenhouse gas emissions. As in the previous years, about three-quarters of the 2018 staff and faculty respondents said they "always" *drive a car to* their work place or did so "most of the time". In contrast, the numbers of staff and faculty who said they most often used an alternative mode of travel to get to and from campus were small; less than 10 percent regularly rode an Ann Arbor Area Transportation Authority (AAATA) bus and just 3 percent of the staff said they carpooled. Yet faculty respondents were seven times more likely than staff said they most often walked or biked to work (15 percent versus 2 percent).

Whereas the proportions of faculty who regularly drive to/from campus have been constant since 2012, the proportion of staff who regularly drive increased significantly in 2018. More than 4 in 5 (83 percent) staff members most often drive to and from the place of employment. Three-quarters of the staff typically drove to campus in previous years.

Despite the predominance of automobile use for work trips, there are encouraging signs that for at least part of the year, staff and faculty partake in other modes when traveling to campus. Although the proportion of faculty that "sometimes" walk or bike to work has not changed since 2012, the numbers of walkers and bikers are not trivial. About 3 in 10 walk to work "sometimes" or "most of the time" and one in 5 ride a bike. Half as many staff respondents sometimes or regularly walk and just 6 percent "sometimes" or "always' ride a bicycle. As the proportions of staff who drive to work has increased, the proportions who walk, bike, and take buses has deceased in recent years. At the same time, U-M bus ridership as a means of commuting has increased. When asked how often they take a U-M bus to work during the past year, 24 percent of the staff and 12 percent of the faculty said "sometimes" or "always/most of the time". These numbers are higher that what was reported in 2012 (18 percent and 9 percent, respectively). Finally, compared to 2012, there were significantly more faculty and staff that drove to satellite parking and then rode a bus to their workplace in 2018. When asked how often they used *park and ride*, 6 percent of the faculty and 18 percent of the staff said they did so "sometimes or 'always or most of the time". In 2012, just 2 percent of the faculty and 5 percent of the staff gave these responses.

As expected, students were much less likely to drive to campus than faculty and staff. Nonetheless, when asked how they *most often* traveled to/from campus during the fall semester, 10 percent of undergraduates and 24 percent of graduate students said they drove a car. More than half (53 percent) typically walked or biked to campus and a quarter (26 percent) said they rode the bus.

[27] Although responses among faculty and staff were similar, differences in responses were found for University employees working in different parts of campus. For example, those working in the Central Campus Southeast sub-region were most likely to say "very important" (45 percent) whereas employees in the Medical Center were least likely to give this response (35 percent). Two other questions addressed staff and faculty awareness of energy consumption and energy conservation features in the building where they worked.

Two indicators - Conservation Behavior and Travel Behavior – represent summaries of individual actions to address climate change. The 2018 indicator scores indicate virtually no change and suggest that new initiatives are needed to encourage U-M students, staff, and faculty to reduce their carbon footprint.

Conservation Behavior Index. As in earlier years, responses to four questions were combined to create a summary indicator showing the status of conservation behavior among the 2018 student, faculty and staff respondents.[28] That is, for each individual respondent, responses to each question were added to create a composite score. Questions dealt with the frequency of turning off lights, turning off the computer when not in use, using power-saving settings on the computer, and using a motion sensor power strip. Table 9 shows that on a scale from 0 to 10, the index score for faculty is 6.7, but lower for staff (6.4) and for students (5.8). The table also presents the distribution of grouped scores (in quartiles) for each respondent group. When compared to conservation behavior scores from previous years, the actions of U-M staff, to conserve energy are unchanged. For students and faculty however, conservation scores are considerably lower that there were in 2015. Longitudinal data from the panel of undergraduate students were similar. Specifically, students who were freshman in 2015 reported a significant decrease in conservation behavior over time; starting from 5.9 in 2015 and declining to 5.7 in 2018 (See Table 21). Similar changes over time were observed among other students in the panel, but were not statistically significant. For example, freshman in 2014 reported a slight decline over time in conservation behavior, declining from 6.2 in 2014, to 6.1 in 2015, and 6.0 in 2018. Similarly, among a new group of undergraduates added to the panel in 2015 as sophomores, conservation behavior declined from 5.9 in 2015 to 5.8 in 2018 when they were seniors.

Table 9

CONSERVATION BEHAVIOR INDICES, for STUDENTS, STAFF, FACULTY

(percentage distributions and mean scores)

2018	Students	Staff	Faculty
High (7.51-10)	9	22	20
(5.01-7.50)	51	45	56
(2.51-5.00)	34	23	21
Low (0-2.50)	6	10	3
Total	**100**	**100**	**100**
Mean Score	**5.8**	**6.4**	**6.7**
Number of respondents (unweighted)	3049	702	808

Travel Behavior Index. As in previous years, a single question is used to summarize the travel behavior among students and a similar question to capture the travel behavior of staff and faculty. For students the question was: "During the fall semester (2017), how did you most often travel to and from campus?" The question asked of staff and faculty was: How do you most often travel to and from your home to your

[28] For staff and faculty, the questions asked about their behaviors during the past year while at work whereas students were asked about their behaviors without reference to whether it occurred on campus or elsewhere.

campus work place?" Response categories for both questions were identical.[29] The index reflects the degree to which the mode of travel impacts the environment. Carbon-free travel (walking, biking) was assigned the highest score while "drive a car" received the lowest score.[30] Travel by bus, the combination of bus and bike, or motorcycle was given the second highest score while respondents who car-pooled, vanpooled or used Rideshare were given the third highest score.

Table 10 shows the mean scores and the proportion of students, staff and faculty representing each quartile on the 0 to 10 scale. Not surprisingly, students, most of whom live on or close to campus, had the highest score (7.5) whereas staff had the lowest score (1.1). Several factors such as the price of fuel, schedule changes in the University and AAATA bus systems, and campus pricing, marketing efforts, and parking policies could alter these scores in the future.

When compared to previous years, 2018 indicator scores for travel behavior are comparable for faculty and students but significantly lower for staff. The mean score for staff is 1.1 compared to 1.5 in 2015($p<.05$). This clearly indicates greater staff reliance on the personal automobile to get to and from the campus. [31]

Table 10

TRAVEL BEHAVIOR INDICES, for STUDENTS, STAFF, FACULTY

(percentage distributions and mean scores)

2018	Students	Staff	Faculty
High (7.51-10)	57	6	10
(5.01-7.50)	26	6	14
(2.51-5.00)	2	4	3
Low (0-2.50)	15	84	73
Total	**100**	**100**	**100**
Mean Score	**7.5**	**1.1**	**2.0**
Number of respondents (unweighted)	3010	721	800

The potential for reducing the proportion of faculty and staff drivers through ride sharing or car-pooling was considered as part of the 2018 and is discussed in Part E of this report.

[29] Because of the slight difference in wording between the student and faculty/staff questionnaires, it was suggested that comparisons between students and U-M employees may be inappropriate. Accordingly, the 2013 faculty/staff questionnaire asked a second travel behavior question, "Since the beginning of the fall semester, how do you most often travel to/from home to your workplace?" As was demonstrated in previous surveys, response distributions to the two questions for faculty and staff were identical. Therefore, the 2018 questionnaire asked the single question that was first asked in 2012.

[30] Differentiation was not considered for drivers of electric or hybrid vehicles since the type of vehicle used was not asked in the questionnaires.

[31] It should be noted that the proportion of staff respondents living in the Ann Arbor-Ypsilanti area has decreased significantly over the years. In the 2012, 40 percent of the staff lived in the Ann Arbor area. The percent decreased to 35 percent in 2015 and to 28 percent in 2018.

Waste Prevention

Recycling and reuse of materials by U-M faculty, staff, and students continues to play a critical role in the University's efforts to divert waste to disposal facilities. Material reuse also impacts University purchasing decisions. To a large extent, staff and faculty are behaving in an environmentally responsible manner while at work. Similarly, U-M students report sound waste reduction practices at home.

Most faculty (93 percent) and staff members (83 percent) said the *always* "recycle" during the past year or did so *most of the time* during work.[32] Similarly, three-quarters of the staff and faculty group the same response when asked how often they "use a reusable water bottle, coffee cup, or travel mug" Finally, more than 4 in 5 staff respondents said they either *always* or *sometimes* "print double-sided". Nine in 10 faculty gave these responses. Yet, when asked about whether they "use U-M Property Disposition services to obtain items such as computers, furniture, and equipment", just a third from both groups said they *sometimes or regularly* used the services.[33]

Many students engage in waste reduction activities, but they are not as diligent as staff and faculty. For instance, 66 percent of the students (compared to 85 percent of staff and 93 percent of faculty) said they regularly recycled during the past year. And three-quarters of the students as well as staff and faculty respondents gave the same response when asked how often they "used a reusable water bottle, coffee cup, or travel mug". When asked about how often they "use U-M Property Disposition services to obtain items such as computers, furniture, and equipment" during the past year, just 1 in 10 students said *sometimes, most of the time,* or *always*. More than a third of the staff and faculty gave these responses. And when students were asked how often they "bring reusable bags to the store" when shopping, less than half (47 percent) said *always* or *sometimes* while fewer (41 percent) said they *always* or *sometimes* "shop for things with minimal packaging". For the most part, these responses are comparable to those reported in the previous SCIP survey (2015).

For many years, tons of waste have been generated during the football season at the U-M stadium (Big House). In fall, 2017, U-M Athletics launched a zero-waste program designed to increase recycling and composting at each football game while diverting waste away from landfills. According to the Ann Arbor News (Slatger 2017), the program was successful in that nearly 90 percent of the total waste created inside the stadium during each game was diverted to compost and recycling.

In order to see how members of the U-M community responded to the new program, questions covering zero-waste at the stadium were asked in the 2018 SCIP survey. First, students, faculty and staff were asked, "How aware are you of U-M's efforts to promote zero-waste events at the Michigan Stadium?" Second, they were asked, "During the past year, did you participate in zero waste events at the Michigan Stadium?" Finally, they were asked to report the number of U-M home games they attended in 2017.

Findings from the survey indicate moderately positive responses to the zero waste program. Among all student respondents, nearly half said they were 'very aware" or "somewhat aware" of zero waste at the

[32] The findings in this section are drawn from Appendix C, Table C5, dealing with waste prevention. Percentages are adjusted to eliminate the not applicable respondents. Unlike previous years, a single recycling question was asked rather that separate questions about recycling bottles, containers, and paper products.

[33] Unless otherwise noted, the use of "regularly" in the text refers the response option, *Always/Most of the time*. Similarly, the use of the term, "always" in the text is meant to connote the *Always/Most of the time response.*

stadium. For students who attended 5 or 6 games, more that 60 percent game these responses. Staff and faculty were more oblivious to the program. About 4 in 10 staff (39 percent) and a third of the faculty (32 percent) said they were "very aware" or "somewhat aware". As with the students, attendance at games affected their level of awareness. Among staff and faculty who attended 5-6 games, more that 80 percent indicated some level of awareness.

As with awareness, participation in the zero-waste program is associated with the number of games attended. Yet, participation in the program for those who attended most games was relatively low. For students who attended 5-6 games, only a third said they participated in zero waste at the stadium. Just a quarter who went to 3-4 games participated. Faculty and staff were somewhat more engaged. About half who attended three or more games participated in zero waste.

Waste Reduction Behavior Index. As in preceding years, individual responses to four questions were combined to create a summary indicator showing the status of waste prevention behavior among U-M students, faculty and staff.[34] That is, for each respondent, their responses to each question were added to create a composite score. Questions dealt with the frequency of recycling, the use of reusable cups, the use of U-M Property Disposition, and printing double-sided when sending work to a printer. Table 11 shows that on a 10-point scale, the index score for staff is 7.2 and for faculty, it is 7.6; for students, it is 7.0. The table also presents for each group, the proportion of respondents whose scores are high in the top quarter of the index, those with relatively low scores, and the proportion in the middle quarters. For students, faculty, and staff, waste prevention behavior scores were significantly higher than scores reported in 2012 but roughly comparable to the 2015 scores.

Longitudinal data from the panel of undergraduate students shows similar trends. Specifically, among undergraduates in the panel who were freshmen in 2014, there was a significant increase in the average waste prevention behavior index score, increasing from 6.8 in 2014 to 7.2 in 2018 (see Table 21). Similarly, among undergraduates in the panel who were freshmen in 2015, there was also a significant increase in the waste prevention behavior index from 6.9 in 2015 to 7.1 in 2018.

Table 11

WASTE PREVENTION BEHAVIOR INDICES, for STUDENTS, STAFF, FACULTY

(percentage distributions and mean scores)

2018	**Students**	**Staff**	**Faculty**
High (7.51-10)	10	28	35
(5.01-7.50)	80	58	58
(2.51-5.00)	9	12	6
Low (0-2.50)	1	2	1
Total	**100**	**100**	**100**
Mean Score	**7.0**	**7.2**	**7.6**
Number of respondents (unweighted)	3043	726	819

[34] As in the case of conservation behavior, the waste reduction questions for staff and faculty asked about behaviors during the past year while at work while for students, questions about behaviors within the past year were without reference to place. That is, the behaviors may have occurred on campus or elsewhere.

Healthy Environments

Students, faculty, and staff are likely to support U-M's goals of protecting water quality in the Huron River and purchasing or obtaining food from sustainable sources. However, there are few direct actions that students, faculty and staff can take to achieve these goals. Nonetheless, individuals who are members of the University community can act to create healthy environments through their actions at home. In earlier SCIP surveys, questions about protecting the natural environment at the place where respondents lived and purchasing sustainable foods were asked of everyone. For the 2018 survey, the decision was made to ask only questions about sustainable foods. Our intent is to reintroduce questions about natural environment protection at home in subsequent SCIP surveys.

With respect to obtaining sustainable foods, questions were asked about household purchases and growing ones' own fruits and vegetables.[35] Among the staff and faculty, about 1 in 5 said he/she (or someone in the household) regularly purchased "locally grown or processed food" during the past year. When asked about the purchase of "organic food", faculty members were nearly twice as likely as staff to say they did so *always* or *most of the time* (28 percent versus 16 percent). One in 7 students gave the same response. When asked to estimate how much of their grocery purchases during the past year was sustainable food, 27 percent of staff and more than a third of the faculty (38 percent) said *all/most* or *more than half* and a quarter from both groups said they *don't know*. Students were somewhat less likely to purchase sustainable foods. One in 5 students purchased sustainable foods at least half of the time and nearly a third did not know if they made such purchases.

The purchase of locally grown foods varied among staff, faculty, and students. When asked if they had shopped at a farmers market or food stand during the past year, more than 4 in 5 staff and faculty members and 3 in 5 students said *yes.* About half of the staff and faculty said they had grown their own fruits and vegetables in a "home garden" or in a "community garden" during the past year. Just a quarter of the students also said they had grown their own fruits and vegetable at home or in a community garden; in 2015, nearly a third of the student respondents gave these responses.

Sustainable Food Purchases Index. This index measuring sustainable food purchases consists of responses to three questions. Two deal with the frequency of buying "locally grown or processed food" and "organic food" during the past year while the third asks respondents to estimate how much of their food purchases during the previous year consisted of sustainable foods. As shown in Table 12, faculty had the highest index score (6.7) with students being somewhat lower (5.3) on average than staff (5.9). Although there are modest differences in mean scores between 2018 and earlier years, there is a shift toward more sustainable food purchases among staff since 2012. The percentage for staff that scored more than 5.0 on the index increased from 70 percent to 75percent between 2012 and 2018. Among faculty, 86 percent scored more than 5.0 in 2018 compared 81 percent in 2012.[36]

[35] Nearly a one-third of student respondents who said they ate most of their meals in campus dining facilities were not asked questions about sustainable food purchases. When asked about the frequency of purchasing different types of food, the remaining students as well as staff and faculty had the option of reporting, "don't know". Data reported here exclude these responses. Frequencies for each question including "don't know" are shown in Appendix C, Table C7.

[36] Sustainable food purchases by students remained fairly constant between 2012 and 2018.

Table 12

SUSTAINABLE FOOD PURCHASING INDICES, for STUDENTS, STAFF, FACULTY

(percentage distributions and mean scores)

2018	Students	Staff	Faculty
High (7.51-10)	13	20	30
(5.01-7.50)	50	54	56
(2.51-5.00)	30	23	13
Low (0-2.50)	7	3	1
Total	**100**	**100**	**100**
Mean Score	**5.3**	**5.9**	**6.7**
Number of respondents (unweighted)	1182	688	782

Community Awareness

As part of the U-M's guiding principle within the Community Awareness theme, the University intends to "pursue strategies toward creating a campus-wide culture of sustainability." Since the initial SCIP surveys in 2012, questions have been asked about awareness of travel and transportation options, waste prevention practices, protecting the natural environment, sustainable foods, and climate change. In 2014, two additional awareness questions were included in the faculty/staff questionnaire dealing with energy conservation in their respective buildings. Finally, all respondents have been asked since the inception of SCIP how much they know about specific actions being taken by the U-M in each of these domains. As noted earlier, awareness of U-M's efforts to promote zero waste at the stadium was added in the 2018 survey.

Sustainable Travel and Transportation. With few exceptions, a significant proportion of staff, faculty and students know relatively little about the range of options for traveling to and from campus and around Ann Arbor. When asked about the AAATA 6 in 10 faculty respondents said they know "not much or nothing", or a little" and the remainder (40 percent) said they know "a lot" or "a fair amount." Staff respondents were more equally divided; a third know "nothing", a third know "a little", and a third know "a lot" or "a fair amount". Students tend to know somewhat more about AAATA; nearly half (46 percent) know "a lot" or "a fair amount". Graduate students know more about AAATA than undergraduates (64 percent versus 38 percent). Whereas awareness of AAATA among faculty and staff has not changed over the 5-year period, students in 2018 are significantly less likely to know about public transportation than students participating in the 2012 sample.

Staff and faculty are also uninformed about the U-M bus system; when asked how much they know about it, nearly two-thirds responded "not much or nothing" or "a little" compared to a quarter (27 percent) of the student body.

As in earlier surveys, few respondents knew about Zipcars or Maven (hourly car rentals), Vanpools, ExpressRide, and Greenride Connect (a U-M carpooling network). One in 10 faculty and half as many

staff know “a lot” or “a fair amount” about Zipcars; 14 percent of the student body gave these responses. The proportions knowing about Maven and other transportation options are even smaller.

In 2015, a bike-sharing program was introduced in central Ann Arbor As part of the 2018 survey, respondents were asked how much they know about this University-City program call “Arbor Bike”. Students tended to know somewhat more about the program than staff or faculty. Overall, about one in twenty from the three groups said they know “a lot” or “a fair amount” about Arbor Bike.[37]

As noted, low levels of awareness of these modes of transportation have not changed since 2012. However, staff respondents tended to know significantly less about Greenride Connect in 2018 than they knew in 2015. In 2015, 16 percent indicated some level of awareness; in 2018, that number decreased to 10 percent.[38] There was also decreased awareness of Greenride Connect among faculty respondents. Ten percent knew about it in 2015 whereas just 6 percent said they know something about it in 2018.

In 2014, awareness of composting was added to the questionnaires for students, faculty and staff. At that time, about one in 7 from each group said they know “a lot” or “a fair amount” while the majority from each group said they know “a little” or “not much/nothing” about composting. The 2018 SCIP data reveal a significantly greater understanding of composting. A quarter of the 2018 student respondents and nearly one in 5 staff and faculty respondents gave these responses. The data also reveal that first year students tended to know more about composting than seniors (38 percent versus 30 percent) whereas graduate students know the least; just 18 percent said they know “a lot” or “a fair amount”.

As in previous years, the 2018 respondents knew considerably little about the U-M’s Property Disposition services. Students too tended to be unaware of the services of Property Disposition. Only 13 percent said they know “a lot” or “a fair amount” about it whereas 40 percent of the staff and faculty gave these responses when asked about the U-M’s *Property Disposition services*.

Sustainable Foods. Within the context of SCIP, Sustainable food is defined as foods that are organic, locally-grown, or fair-trade foods, food from humanely-treated animals or animals that have not been given hormones or antibiotics, grass-fed beef, and fish from sustainable fisheries. In general, faculty tended to know more about each of these items than staff. Students were likely to know less than both groups. For instance, 63 percent of the faculty and 53 percent of the staff said they know “a lot” or “a fair amount” about *locally grown or processed food* compared to 47 percent of the students. Similarly, 70 percent of faculty members know “a lot” or “a fair amount” about *organic foods* compared 62 percent of the staff and 55percent of student respondents.

For other types of sustainable foods, there were substantial numbers from each respondent group who said they know “not much or nothing”. For faculty, this response ranged from 40 percent to 48 percent. For staff, the range was 45 to 64 percent, and among students, between 53 percent and 67 percent said they know “not much or nothing” about the other types of sustainable food.

Despite these proportions indicating a limited understanding of various types of sustainable foods, there is a general increase in understanding what is meant by sustainable foods since 2012. For example, the

[37] As of the release of this report, Arbor Bike is preparing for a relaunch with a new operator.

[38] These are respondents who said they know “a lot”, “a fair amount”, or “a little” about U-M Greenride/ Connect. In earlier SCIP surveys, the question was asked about the service , U-M Greenride/ iShareaRide.

2018 student sample knows more than the 2012 students about "fair trade foods", "food from humanely-treated animals", "grass-fed beef", and "fish from sustainable fisheries". The 2018 staff respondents also know more than their colleagues who responded in 2012 about "grass-fed beef" and "fair trade food" while faculty overall have a greater understanding of "food from humanely treated animals" and food from animals not given hormones or antibiotics"

Building Energy Conservation. In 2014, two new awareness questions were added to the staff/faculty questionnaire. The questions were intended to find out how much U-M employees knew about energy consumption and the University's energy reduction features in the particular building where respondents worked. When asked about energy use in their buildings in 2018, about 1 in 7 (14 percent of faculty and 15 percent of staff) said they know "a lot" or "a fair amount". The numbers were equally low when asked about the energy conservation features in the respondents' buildings. Less than 20 percent said they know "a lot" or "a fair amount" whereas half said they know "not much or nothing at all". These figures are comparable to those reported in 2014 and in 2015.

Awareness Indices. In the first year of SCIP**,** separate awareness indicators were developed for Sustainable Travel and Transportation, Waste Prevention, Natural Environment Protection, and Sustainable Foods. For each, index scores were created for each respondent by summing responses to all items within the domain. For example, if respondents said they know "a lot" about each individual type of sustainable food, they would receive the highest score; if they said "not much or nothing" about each type, the lowest score would be assigned to those respondents. Since levels of awareness for individuals vary among the items within each domain, their index scores are distributed between the highest levels of awareness and the lowest levels. The same procedure has been followed in subsequent years.[39] The distributions of the 2018 index scores and mean scores covering awareness of travel options and sustainable foods are shown in Tables 13 and Table 14 respectively.

Table 13

SUSTAINABLE TRAVEL AWARENESS INDICES , for STUDENTS, STAFF, FACULTY

(percentage distributions and mean scores)

2018	**Students**	**Staff**	**Faculty**
High (7.51-10)	4	2	4
(5.01-7.50)	22	10	18
(2.51-5.00)	46	33	33
Low (0-2.50)	28	55	45
Total	**100**	**100**	**100**
Mean Score	**4.1**	**2.9**	**3.4**
Number of respondents (unweighted)	3055	729	814

[39]The Sustainable Travel and Transportation Awareness Index has 4 items: knowledge of AAATA, U-M buses, Biking, and either the Zipcar or Maven rentals. (The score for the rental car item with the highest level of awareness is used in creating the index). The Sustainable Foods Awareness Index contains 7 items: knowledge about locally grown/processed foods, organic foods, fair trade food, food from humanely-treated animals, food from hormone-free and antibiotic-free animals, grass-fed beef and fish from sustainable fisheries. In 2018, there are no index scores covering awareness of Natural Resource Protection since the items (questions) were not included in the recent surveys. Similarly, by replacing three questions covering recycling with a single question, a Waste Prevention Awareness index comparable to what was presented in the past is not included in this report.

Table 14

SUSTAINABLE FOOD AWARENESS INDICES, for STUDENTS, STAFF, FACULTY

(percentage distributions and mean scores)

2018	Students	Staff	Faculty
High (7.51-10)	12	17	24
(5.01-7.50)	28	29	34
(2.51-5.00)	38	35	31
Low (0-2.50)	22	19	11
Total	**100**	**100**	**100**
Mean Score	**4.5**	**4.9**	**5.7**
Number of respondents (unweighted)	3047	731	818

Table 13 reveals that compared to staff and faculty, students are more aware of sustainable travel options available to them in Ann Arbor and at U-M. These scores and distributions are comparable to those reported in earlier SCIP surveys for students and faculty. However, they are significantly lower for the U-M staff who know considerably less about transportation options that they did in previous years. With respect to understanding sustainable foods, students know the least about them (4.5) whereas faculty members are most knowledgeable (5.7).

Levels of awareness about sustainable travel and sustainable foods, based on index scores have tended to fluctuate over the first four years of SCIP. However, the awareness scores were significantly lower in 2018. The transportation awareness index for students decreased from 4.4 in 2012 to 4.1 in 2018 ($p<.001$). The same index scored for staff decreased from 3.0 in 2012 to 2.8 in 2018 ($p<.05$). Although the sustainability food scores in 2018 were comparable to those reported in 2012, they were significantly lower that they were in the previous (2015) survey for all three groups ($p<.05$). Differences over time are shown in Appendix Tables E1a and E1b.

Index scores for the panel of undergraduate students suggest a somewhat different picture in that there were significant increases in the travel and transportation awareness index over time, and stability in the sustainable food awareness index. Specifically, among freshmen in 2014, the average transportation awareness index score significantly increased over four years, moving from 3.4 in 2014 to 4.5 in 2018 (see Table 21). It is interesting to note that among this group there was little change observed between their freshmen (2014) and sophomore (2015) years. The largest increase occurred from their sophomore year in 2015 (3.6) to 2018 when they were seniors (4.5). Near exact trends were observed among other panel groups (see Table 21). For example, among those who were freshmen in 2015, the average travel/transportation index score increased significantly from 3.4 in 2015 to 4.5 in 2018. Similarly, among the new group of undergraduate students added to the panel as sophomores in 2015, scores on this index significantly increased from 3.7 in 2015 to 4.7 in 2018. For travel and transportation, the data clearly indicate that the longer students are on campus the more they know and learn about the sustainable transportation options in Ann Arbor.

In contrast, average sustainable food awareness index scores for almost all panel groups did not significantly change over time. Slight (albeit non-significant) increases were observed, which is in contrast to the significant declines observed in the cross-sectional data. The one exception was a group in

the student panel who were freshmen in 2014 and seniors in 2018. This group is reported on in detail in Appendix Table E2. This group includes the N=195 reported on in Table 21 who participated in SCIP in 2014, 2015, and 2018, and also includes those who participated in only 2014 and 2018, but did not participate in 2015. Among this group, scores on the sustainable food awareness index significantly increased from 4.2 in 2015 to 4.5 in 2018.

Generally, across these awareness indices, additional analysis is needed to determine whether changes observed among individual students are attributable to their intrinsic interest in sustainability, to U-M's efforts to raise levels of awareness, or to other factors.

U-M Sustainability Initiatives. In previous years, respondents were also asked the extent to which they were aware of specific sustainability initiatives or actions taken by the U-M. These included the University's efforts to *conserve energy, reduce greenhouse gas emissions, encourage people to take a bus or bike, maintain campus grounds in an environmentally-friendly manner, promote ride-sharing, promote recycling, promote food from sustainable sources, promote composting,* and *protect the Huron River.* Questions about people's understanding of these sustainability initiatives were repeated in the 2018 surveys. In addition, all 2018 respondent asked about other U-M initiatives-- efforts to-*promote zero waste events at the Michigan Stadium* and to *promote other zero waste events.* The 2018 students were also asked about the university's efforts to *promote the Sustainability Living Experience (SLI).*
In 2018, members of the University community were most likely to be "very aware" or "somewhat aware" of the U-M's efforts to *promote recycling* (8 in 10) and least likely to give these responses to *protect the Huron River* (3 in 10). As in the 2014 and 2015 questionnaires participants were asked about U-M's efforts to promote composting, a relatively new initiative on campus. Nearly 6 in 10 students said they were "very aware" or 'somewhat aware" and about half as many staff and faculty gave these responses.

In general, staff tended to be more aware of U-M's sustainability initiatives than faculty or students. For instance, relatively higher levels of awareness were reported by staff for *encouraging people to take a bus or bike promoting ride-sharing* and *maintaining campus grounds in an environmentally friendly manner*. Staff respondents were just as aware as students and faculty about the University's efforts to conserve energy and promote recycling,

The 2018 student respondents were less likely to know about U-M's efforts *protect the Huron River* than staff or faculty. Similarly, they were less aware than staff or faculty to know about initiatives to *promote ride-sharing* but more aware than others about U-M's work to *promote all waste prevention events.*

With respect to being aware of the zero waste program at the stadium, less than two-thirds (62 percent) of the students who attended most (5-6) games said they were "very aware" or 'somewhat aware' of the program. The relatively small sample (n=111) of faculty and staff who attended most games were likely to know more about it; four in 5 said they were "very aware" or "somewhat aware".

U-M Sustainability Initiatives Awareness Index. This indicator was developed in 2012 using a similar approach to that employed in creating the other awareness indicators. The process was repeated with the 2018 data. Mean scores were then calculated for students, staff, and faculty and are shown in Table 15. The Table clearly indicates that overall, staff respondents were most knowledgeable about what the U-M was doing about sustainability (5.5) whereas faculty and students were less knowledgeable (5.2 each).

Table 15

U-M SUSTAINABILITY INITIATIVES AWARENESS INDICES, for STUDENTS, STAFF, FACULTY

(percentage distributions and mean scores)

2018	Students	Staff	Faculty
High (7.51-10)	13	15	12
(5.01-7.50)	39	43	39
(2.51-5.00)	35	31	36
Low (0-2.50)	13	11	13
Total	**100**	**100**	**100**
Mean Score	**5.2**	**5.5**	**5.2**
Number of respondents	3034	725	815

A comparison of the 2018 indicator scores with those from earlier samples indicate that levels of awareness among students and staff about U-M's sustainability initiatives have not changed. At the same time, faculty awareness showed a modest but significantly increase from 2012 to 2018.

Among undergraduate students participating in the panel, their awareness of the University's campus sustainability activities did not significantly change over time.

Other Key Findings and Indices

Among the other dimensions that define culture of sustainability on campus are the degree to which students, faculty, and staff are engaged in sustainable activities beyond the individual behaviors reported earlier, the extent to which they are committed to a sustainable lifestyle, and their inclinations or disposition toward establishing a more sustainable lifestyle. These dimensions of sustainability culture were measured as part of the student and faculty-staff questionnaires[40].

Engagement. There are numerous ways that people can be involved or engaged in sustainability activities, both on campus and elsewhere. In addition to the individual pro-environmental activities that have been explored thus far such as buying sustainable foods, turning off lights, using non-motorized or public transportation, students, faculty and staff can participate or engage in organized sustainability activities alone or collectively. In order to determine how much of this occurs on campus, respondents were asked if they had participated in a U-M sustainability organization, in campus events including a *Planet Blue Open House, Earthfest, RecycleMania, Zero Waste events at the Michigan Stadium or elsewhere*, a M Farmers Market and the *Planet Blue Ambassadors Certificate Program* during the past year They were also asked if, during the past year, they had *visited the Planet Blue website* and read about U-M's sustainability efforts in the Michigan Daily or other media outlets. Staff and faculty were also asked about their engagement in the *Sustainability Workplace Certificate Program* while students were asked if

[40] Although an individual's disposition toward establishing a more sustainable lifestyle was measured as part of earlier SCIP surveys, questions designed to measure disposition were not included in the 2018 questionnaires.

they had participated in the *Kill-a-Watt program* and if they had taken *a U-M course that addressed sustainability.*

Faculty and staff members were most engaged through their participation in a M Farmers Market where a third of the staff and one in 5 faculty responded affirmatively. Similarly, about one in 5 from both groups had visited the Planet Blue website during the past year, and nearly half had read about U-M sustainability efforts in the Daily or some other media outlet. For each of the remaining U-M events or activities included in the questionnaires, less than one in 8 faculty and staff respondents gave an affirmative answer when asked whether or not they participated. As was demonstrated in earlier surveys, U-M students tend to be more engaged than staff or faculty but also with low levels of involvement. In fact, just one in 5 (19 percent) of the undergraduate students said they participated in a *sustainability organization on campus* and even fewer (15 percent) said they had taken a *course addressing sustainability* during the past year.

It is difficult to determine the degree to which levels of engagement in U-M sustainability activities for the 2018 sample differ from earlier years. One reason is a change in questionnaire wording reflecting the time of engagement. In 2015, respondents were asked two sets of questions: whether or not they had ever engaged in each activity and whether or not they had engaged in each activity during the past year.[41]

The second reason deals with the time of the year when the 2018 questionnaires were administered. Earlier SCIP questionnaires were administered at the beginning of the fall semester (October-November) whereas the 2018 surveys were administered during the winter semester (February-March 2018). Therefore, it is not clear how each set of participants interpreted the meaning of the phrase, "During the past year". Under the assumption that the current survey participants interpreted the phrase, "During the past year" questions in the same way as the 2015 respondents, comparisons between the 2018 and 2015 levels of engagement can be made.

Faculty and staff also reported somewhat lower participation in the Planet Blue Ambassadors program than in 2015. Involvement decreased from 17 percent to 10 percent for staff and from 13 percent to 5 percent for faculty. On the other hand, use of an M Farmers Market was unchanged over the same time period.

U-M Sustainability Engagement Index. Index scores were created for students and for staff and faculty and converted in a common metric ranging from 0 to 10. For students, four items were used; whether or not they were members of any *sustainability organization* on campus, whether or not they had attended an *Earthfest*, whether or not they had taken a *course that addressed sustainability, and whether or not they participated in the Planet Blue Ambassadors Program.*[42] The index for staff and faculty consisted of

[41]In earlier SCIP surveys, questions were asked about engagement in U-M sustainability activities at any time. That is, the questions were prefaced with "Have you ever participated in...?" Another set of engagement questions were added beginning in 2015. These were prefaced with "During the past year, have you participated in…? The questions using the "past year" timeframe were repeated in the 2018 questionnaires. The "Have you ever" questions in 2015 enabled comparisons with earlier survey findings. It was expected that the "During the past year" questions would be repeated in subsequent SCIP surveys enabling researchers to track levels of engagement in sustainability activities during a specific timeframe.

[42] This index was created in 2015 and unlike previously reported Sustainability Engagement at U-M, differs in two ways. First, it asks about participation "during the past year" rather than at any previous point in time. The second way in which it is different is that it includes responses to the item dealing with the Planet Blue Ambassadors Program. The new engagement index is referred to as U-M Sustainability Engagement-2

responses to the first three items dealing with membership in a campus susta*inability organization*, Earthfest attendance, and being a Planet Blue Ambassador. As seen by the mean scores in Table 16, the level of engagement for all respondents was relatively low with students having a mean value of 1.2 and staff and faculty having scores of 0.8 and 0.7, respectively.

Table 16

U-M SUSTAINABILITY ENGAGEMENT INDEX-2, BY STUDENTS, STAFF, FACULTY

(percentage distributions and mean scores)

2018	Students	Staff	Faculty
High (7.51-10)	1	1	1
(5.01-7.50)	3	4	3
(2.51-5.00)	9	12	14
Low (0-2.50)	87	83	82
Total	**100**	**100**	**100**
Mean Score	**1.2**	**0.8**	**0.7**
Number of respondents	3027	713	799

When comparing engagement scores for each group on campus between 2015 and 2018 there are significant differences. Students' overall engagement score decreased from 1.7 in 2015 to 1.2 in 2018 ($p<.01$). Similarly, there were decreases in engagement on campus among staff and faculty.

However, the general trend observed among students who participated in the panel was increased engagement over time. For example, the panel group who were freshmen in 2015 became significantly more engaged over time, with their U-M Sustainability Engagement Index-2 score increasing from 0.7 in 2015 when they were freshman to 1.8 in 2018 when they were juniors. Similarly, among the new group added to the panel as sophomores in 2015, engagement on campus significantly increased from 1.4 in 2015 when they were sophomores to 2.2 in 2018 when they were seniors (see Table 21).

In addition to examining sustainability engagement on campus, engagement in matters related to sustainability while students, staff, and faculty were not on campus was explored. Accordingly, a brief series of questions was asked about participation in selected sustainability-related activities during the past year. Specifically, staff, faculty and students were asked whether or not they had engaged in any of four activities during the past year to promote sustainability issues such as environmental protection, energy or water conservation, open space preservation, non-motorized transportation, and so forth. The four activities were: *given money to an organization or advocacy group* supporting one of the above issues, *volunteered for an organization or advocacy group* supporting one of the above issues, *served in a leadership position for an organization* or advocacy group supporting one of the above issues, and *voted for a candidate for public office because of his/her position* on one of the above issues.

Among the faculty, more than half (55 percent) answered "yes" when asked whether they had given money *to an organization or advocacy group* during the past year and 69 percent answered affirmatively when asked whether or not they *voted for a candidate for public office because of his/her position* during

the same period. On the other hand, only 1 in 10 had volunteered for an *environmentally-related organization or advocacy group.* Whereas volunteerism among the faculty remained fairly constant since 2012, faculty environmental donations and voting for a pro-environmental candidates have increased significantly, particularly since 2015.

For staff, nearly a third had contributed money while half said they *voted for a candidate for public office because of his/her position* on an environmental issue. As in the case of faculty, just one in 10 said they had *volunteered for an organization or advocacy group* or *served in a leadership position in such an organization*. These staff numbers have been fairly consistent since 2012.

As in the past, 2018 students contributed both time and money to support sustainability. A fifth said they had *given money to an environmental organization* and a quarter said they had *volunteered for an organization or advocacy group during the past year*. Students who reported voluntary activity during the past year increased to 26 percent from 22 percent in 2012 ($p<.01$) while voting for a pro-environmental candidate increased significantly since 2012 from 22 percent to 48 percent ($p<.001$).

General Sustainability Engagement Index. The four items were combined to create another engagement index that in part demonstrates a degree of commitment toward sustainability. The index scores shown in Table 17 suggest that despite relatedly low levels of engagement in sustainability through philanthropy, volunteerism, and voting behavior, members of the University community were more engaged off-campus than while on-campus. Furthermore, faculty members have a higher level of general engagement than staff or students, reflected in large part by their voting behavior and financial contributions.

Table 17

GENERAL SUSTAINABILITY ENGAGEMENT INDEX , BY STUDENTS, STAFF, FACULTY

(percentage distributions and means)

2018	Students	Staff	Faculty
High (7.51-10)	3	2	2
(5.01-7.50)	7	5	5
(2.51-5.00)	18	21	40
Low (0-2.50)	72	72	53
Total	**100**	**100**	**100**
Mean Score	**2.4**	**2.4**	**3.4**
Number of respondents	3044	723	811

When comparing general engagement on sustainability issues between 2018 and earlier years, significant changes were found within all three groups, The increase was most dramatic since 2015 suggesting a greater concern at U-M about the environmental matters generally.

Commitment. Clearly, commitment to sustainability is demonstrated in part by the actions that people take and their behaviors on a day-to-day basis, both on-campus and off-campus. But the degree to which people believe they are committed to a sustainable way of life can also reflect the culture of sustainability.

Accordingly, respondents were asked two questions near the end of the questionnaire. One asked, "Overall, how committed are you to sustainability?" with the following response categories: *very committed, somewhat committed, not very committed,* and *not at all committed*. The second question was, "Who are or what has been most influential in shaping your views about sustainability?"[43]

Faculty members were most committed to sustainability with four in 10 saying they were *very committed*. Nearly a fifth (18 percent) of the students and 19 percent of staff gave this response. While the majority of respondents from each group said they were somewhat committed, there was a sizable number who said they were *not very committed* or *not committed at all to* sustainability; 8 percent of faculty, 19 percent of the staff and 23 percent of the student body indicated they were uncommitted. Graduate students were more committed than undergraduates; 81 percent of the former said they were *very committed* or *somewhat committed to sustainability* compared to 77 percent of undergraduates.

Respondents were given a range of options as to who or what was most influential in shaping their views about sustainability and also the option of writing in a response. More than half of the faculty said that various forms of media (newspapers, TV, books, etc.) had the greatest impact on their views and commitment to sustainability. Media was also mentioned by nearly half of the staff and a third of the student respondents. Friends, classmates, and family were also identified as most influential is shaping the views of students. A quarter of the graduate students said their friends and classmates were most influential compared to 18 percent of undergraduates. As in previous years, the influence of U-M professors and instructors on student views increased in importance for each cohort of undergraduates. Among all students, 13 percent said that their U-M professors or instructors were most influential in shaping their views about sustainability compared to 10 percent who credited this group in 2013.

Commitment Index. Responses to the commitment question were quantified and the values were recalculated for the 0 to 10 scale. As Table 18 shows, self-reported levels of commitment to sustainability are higher among faculty than among students or staff respondents.

Table 18

COMMITMENT INDEX SCORES, by STUDENTS, STAFF, FACULTY

(percentage distributions and mean scores)

2018	Students	Staff	Faculty
High (7.51-10)	18	20	39
(5.01-7.50)	58	61	54
(2.51-5.00)	21	17	6
Low (0-2.50)	3	2	1
Total	**100**	**100**	**100**
Mean Score	**6.4**	**6.6**	**7.7**
Number of respondents	3049	726	817

[43] For a complete list of responses to both questions for each student cohort and for staff and faculty, see Appendix C, Table 12.

Commitment indicator scores for staff and faculty are significantly higher in 2018 than in previous years. Whereas the change in degree of commitment has been gradual for both groups, the change has been most dramatic among faculty respondents, particularly since 2015 when the index score was 7.2. For students as a whole, the 2018 indicator score for commitment to sustainability is generally as high as staff and comparable to scores reported in earlier years.

A higher level of commitment over time is highlighted by panel data that show an increase among students who participated in the SCIP surveys in multiple years. Among the 195 students who first participated in SCIP in 2014 as freshmen, their average commitment score significantly increased over four years from 6.3 in 2014 to 6.8 in 2018 when they were seniors. A closer examination of data presented in Table 21 across all panel groups suggests the largest increases in sustainability commitment occur from students' freshmen to junior years. For example, the panel group who were freshmen in 2015 reported a score of 6.3 in 2015, which significantly increased to 6.7 in 2018. In contrast among the new panel group, who were sophomores in 2015, there was a non-significant incremental increase in commitment from 2015 (6.6) to 2018 (6.8). These scores were identical to those reported by the other panel group (N=195) who participated in SCIP as freshmen in 2014, sophomores in 2015, and seniors in 2018.

Evaluation of the U-M's Sustainability Initiatives. Earlier, we reported the degree to which staff, faculty and students were aware of various efforts put forth by U-M officials to create a more sustainable campus. For those indicating some level of awareness of each of the initiatives, they were then asked to rate or grade its success or performance. Findings for the 2018 survey are shown in the second part of Appendix C, Table C11 and reveal that, on average, respondents tended to give the University "fair" to "good" grades. Highest grades were given to U-M's efforts to promote *recycling* whereas relatively low grades were given to *reducing greenhouse gases* and *promoting ride sharing.*

Student ratings of U-M sustainability activities in 2018 are generally lower than those reported in earlier surveys. For example, students gave poorer grades to U-M's efforts to conserve energy, to promote ride-sharing and reduce greenhouse gas emissions. For staff and faculty, they are largely unchanged from previous years.

U-M's Sustainability Initiatives Ratings Index. A summary index score was calculated for respondents who indicated some level of awareness for each of eight U-M sustainability initiatives.[44] Table 19 shows that, the overall performance ratings of the U-M's sustainability initiatives were fairly comparable for the 2018 samples. Current rating scores for faculty, staff, and students are comparable to rating scores in previous years. For students participating in the panel who were freshmen in 2014, their ratings were significantly lower in 2018 (6.2) than in 2015 (6.6) and 2014 (7.1). This significant decline over time was observed across all groups of students in the panel (see Table 21 and Appendix Table E2).

[44]Although respondents were asked awareness questions covering 12 initiatives, they were only asked to evaluate U-M efforts for the 8 original initiatives asked in 2012. Since that time, additional U-M initiatives have been introduced. These include composting and zero wastes events.
As in the case of other indices, respondents who did not rate more than two U-M initiatives were eliminated when creating the ratings index. If the remaining respondents did not rate one or two of the items comprising the index, they were assigned the modal value of those items for their entire group - e.g. the modal value for either students, staff, or faculty. See Appendix D for a discussion of index construction.

Table 19

U-M SUSTAINABILITY INITIATIVES RATING INDICES, for STUDENTS, STAFF, FACULTY

(percentage distributions and mean scores)

2018	All Students	Staff	Faculty
High (7.51-10)	21	23	19
(5.01-7.50)	60	60	62
(2.51-5.00)	18	17	18
Low (0-2.50)	1	0	1
Total	**100**	**100**	**100**
Mean Score	**6.6**	**6.7**	**6.6**
Number of respondents (unweighted)	2443	575	594

Summary of Indices for the 2018 Sample

Table 20 summarizes the 2018 indicator mean scores and changes, if any, for students, staff, and faculty. The table reveals several things similar to what was found in the earlier surveys.

First, there is considerable room for improvement in the pro-environment behaviors, levels of awareness, degrees of engagement, and expressions of commitment to sustainability among members of the University community. Nonetheless, positive changes have occurred over time in individual efforts to reduce waste.

Second, students' mode of travel to and from campus is more in line with the goal of greenhouse gas reduction than the journey to work of staff and faculty. Not surprisingly, students are most likely to walk, bike, or bus to campus. Similarly, students know more than University employees about transportation options available to them in Ann Arbor. Yet student understanding of these options has declined over time.

Third, faculty are more engaged in pro-environmental behaviors than students or staff. These activities include reducing waste and purchasing sustainable foods, Faculty members also express a higher degree of commitment to sustainability than staff or students.

Fourth, sustainability engagement outside the University (generally) increased significantly among students, staff, and faculty. This reflects an increase in voting for candidates with pro-environmental values, donating money to such candidates or to an environmental organization, and volunteering for an environmental advocacy group.

Finally, staff tend to know more about U-M's sustainability initiatives than either students or faculty. Yet students are more engaged than either staff or faculty in sustainability activities on campus. Engagement

on campus for all groups is lower than it was in 2015. Nonetheless, faculty and staff express high levels of commitment to sustainability than they did in 2012. [45]

Table 20

SUMMARY SUSTAINABILITY CULTURAL INDICATORS for STUDENTS, STAFF AND FACULTY

(mean scores & significant changes)[a]

2018	Students	Staff	Faculty
PRIMARY			
Climate Action			
Conservation Behavior	5.8 ⬇▼	6.4	6.7 ▼
Travel Behavior	7.5	1.1 ⬇▽	2.0
Waste Prevention			
Waste Prevention Behavior	7.0 ⬆	7.2 ⇧	7.6⬆
Healthy Environments			
Sustainable Food Purchases	5.3	5.9 ⇧	6.7⬆▲
Community Awareness			
Sustainable Travel & Transportation	4.1⬇	2.9 ▽	3.4
Sustainable Foods	4.5 ▽	4.9 ▽	5.7 ▽
U-M Sustainability Initiatives	5.2 △	5.5	5.2 ⇧
SECONDARY			
Sustainability Engagement at U-M-2	1.2 ▼	0.8 ▼	0.7 ▼
Sustainability Engagement Generally	2.4⬆▲	2.4⬆▲	3.4⬆▲
Sustainability Commitment	6.4	6.6⇧	7.7⬆▲
Rating U-M Sustainability Initiatives	6.6	6.7	6.6

[s]ignificant changes are based on analyses of mean scores for the 5 years as shown in Appendix Tables E1a & E1b

⬆ significant change from 2012 (p<.001)

⇧ significant change from 2012 (p<.01)

⇧ significant change from 2012 (p<.05)

▲ significant change from previous year (p<.001)

▲ significant change from previous year (p<.01)

△ significant change from previous year (p<.05)

[45] All student, staff, and faculty indicator scores for 2012, 2013, 2014, 2015 and 2018 are summarized in Appendix Tables E1a and E1b.

Undergraduate Panel Data

Data from the panel of undergraduate students who participated in the surveys over multiple consecutive years suggest that in some respects, a shift in the culture of sustainability is occurring on the U-M campus. This is indicated by the fact that generally sustainability behaviors, awareness, and attitudes either increased or were stable over time. The one exception was a decline in student ratings of U-M sustainability initiatives over time. This could suggest that as students take advantage of on campus opportunities to learn more about and become engaged in sustainability they also become more critical.

Table 21 reports index scores for three separate student groups or cohorts within the panel. The first group of 195 undergraduate students were freshmen in 2014 when they first participated in SCIP. They then participated in SCIP again in 2015 as sophomores, and a third time in 2018 when they were seniors. The second panel group includes 414 students who were freshmen in 2015 when they first participated in SCIP, and they participated again in 2018 as juniors. The third group includes 133 students newly added to the panel who were sophomores in 2015 and participated again (a second time) as seniors in 2018. Data from these three groups of undergraduate students provide a unique opportunity to understand how individuals within each of the groups change over time in terms of their sustainability behaviors, awareness, and attitudes. The data also reveal similarities and differences across groups who enroll at U-M at different points in time.[46] Detailed findings from the panel data are presented below, followed next by a brief across group comparison, and lastly a summary of panel findings.

Freshmen in 2014: The first panel group of undergraduate students shown in Table 21 were freshmen in 2014 and participated again in 2015 and 2018 (N=195). In terms of changes in sustainability behaviors among this group, conservation behavior was largely stable across the four years that they participated (2014 - 6.2 to 2018 - 6.0). In terms of travel behavior, there was a significant increase from this group's freshmen (2014 - 7.8) to sophomore (2015 - 8.6) years. Then from their sophomore (2015) to senior (2018) years there was a slight non-significant decline in sustainable travel/transportation. In contrast, change in waste prevention behavior was significant at each time point, increasing from 6.8 in 2014, to 7.0 in 2015, and then up to 7.2 in 2018. Sustainable food purchases among this group did not change significantly over time, a finding largely attributable to the small sample size for this analysis (N=8). However, descriptively there was a notable steady decline over time (2014 - 5.9; 2015 - 5.5; 2018 - 4.8) on this index. In terms of awareness, only awareness of sustainable travel and transportation options in Ann Arbor significantly increased over time, with the largest increase occurring between this group's

[46] It is important to note in Table 21 that sample size has an impact on the group mean difference necessary to be determined statistically significant. Specifically, the larger the sample size, as is the case for the 2015 freshmen group (N=414), smaller mean differences across years can be determined to be statistically significant when the same mean difference observed in a smaller sample (e.g., the N=133 group who were sophomores in 2015) will not be statistically significant. Therefore when making comparisons across cohorts it is important to look at both descriptive trends as well as the statistical significance (i.e., p-value) of the changes over time. Also, it is important to note that the data presented in Table 21 are for students who participated in all possible years for their cohort (e.g., all three years for the first group). Students were removed from analyses conducted for Table 21 if they did not participate in any of their possible time points. Given that these groups of students may be different in some ways compared to the students who participated in only some of the available time points we also present data in Appendix Table E2 for the group who were freshmen in 2014 including all students who participated in at least the first (2014) and last possible time point (2018). In large part a comparison of results from Table 21 and Appendix Table E2 shows similar findings. A few differences were observed in terms of the significance level of changes across years, but the trends are in the same direction across the panel groups.

sophomore (2015 - 3.6) and senior (2018 - 4.5) years. Awareness of sustainable food and U-M sustainability initiatives exhibited slight albeit non-significant increases over time. Examination of change in on campus sustainability engagement across all three time points was not possible among this group given modifications made to this index in 2015. The data from 2015 and 2018 however, do indicate some change in engagement among this group, increasing slightly but not significantly from 2.1 to 2.4. Engagement in sustainability generally did not change from 2014 to 2015, but there was a significant change over the four year period, from 2014 (2.3) to 2018 (3.2), as well as from 2015 (2.1) to (3.2). Scores on the sustainability commitment index were largely stable over time among this group, with only a slight non-significant increase from 2014 (6.3) to 2015 (6.6) and then to 2018 (6.8). However, when comparing change over this group's four years of participation from 2014 to 2018 the increase over time from 6.3 to 6.8 was statistically significant. Lastly, in terms of student ratings of U-M sustainability initiatives there was significant decline at each of the three time points spanning four years. Specifically, ratings among this group were highest in 2014 when this group of students were freshman (7.1), then significantly declined to 6.6 in 2015, and significantly declined further to 6.2 in 2018.

Freshmen in 2015: The second panel group of undergraduate students reported on in Table 21 were freshmen in 2015 who participated in SCIP a second time in 2018 (N=414). In terms of sustainability behaviors, conservation behavior significantly declined among this group from 5.9 in 2015 to 5.7 in 2018 when they were juniors. In terms of use of sustainable modes of travel and transportation, there was a significant increase from this group's freshmen (2015 - 7.8) to junior (2018 - 8.2) years. Similar to the first group, waste prevention behavior significantly increased from 2015 (6.9) to 2018 (7.1). The purchase of sustainable foods was the one indicator in which there was no significant change over time among this group. However, as was the case for the first panel group (freshmen in 2015), the small sample size for this specific analysis (N=20) largely explains the non-significant change as scores on this index declined from 4.8 in 2015 to 5.1 in 2018. In terms of awareness, only awareness of sustainable travel and transportation options in Ann Arbor significantly increased over time (2015 - 3.4; 2018 - 4.5). Awareness of sustainable food exhibited a slight albeit non-significant increase over time (2015 - 4.3; 2018 - 4.5), while awareness of U-M sustainability initiatives exhibited a slight non-significant decline over time (2015 - 5.7; 2018 - 5.5). This group reported a significant increase in sustainability engagement on campus with an average score on this index of 0.7 in 2015 and 1.8 in 2018. A similar significant increase was also found for sustainability engagement generally, which increased from 2.0 in 2015 to 2.8 in 2018. Scores on the sustainability commitment index also significantly increased from 2015 (6.3) to 2018 (6.7). Lastly, in terms of student ratings of U-M sustainability initiatives there was consistent and significant decline among this group from their freshmen year in 2015 (7.0) to their junior year in 2018 (6.3).

Sophomores in 2015: The third panel group presented in Table 21 was newly added to the undergraduate panel after their initial participation in SCIP in 2015, and they participated a second time in 2018 as seniors (N=133). In terms of sustainability behaviors, there were no significant changes over time for any of the four behaviors examined (conservation, travel/transportation, waste prevention, and sustainable food purchases). Scores on all four were largely stable, with slight non-significant declines observed over time for conservation behavior (2015 - 5.9; 2018 - 5.8) and travel/transportation behavior (2015 - 8.4; 2018 - 8.1). In contrast waste prevention behavior increased slightly (2015 - 7.1; 2018 - 7.2) and sustainable food purchases scores were exactly the same at both time points (5.5). In terms of awareness, similar as the other two panel groups, only awareness of sustainable travel and transportation options in Ann Arbor significantly increased over time (2015 - 3.7; 2018 - 4.7). Awareness of sustainable foods exhibited a slight albeit non-significant increase over time from 2015 (4.5) to 2018 (4.6), while awareness of U-M sustainability initiatives exhibited a slight non-significant decline over time (2015 - 5.8; 2018 -

5.6). This group similar to the second panel group (freshmen in 2015) reported a significant increase in levels of engagement on campus with an average score on this index of 1.4 in 2015 and 2.2 in 2018. A similar significant increase was also found for sustainability engagement generally, which increased from 2.2 in 2015 to 3.1 in 2018. In contrast, sustainability commitment was stable with only slight non-significant change among this group from 2015 (6.6) to 2018 (6.8). Lastly, in terms of student ratings of U-M sustainability initiatives there was consistent and significant decline among this group from their sophomore year in 2015 (7.0) to their junior year in 2018 (6.5).

Comparisons Across Cohorts: When comparing patterns of change across the three different panel groups some interesting findings emerge. First, across all three groups the direction and rate of change across the indices is largely similar. This could suggest consistency over time in U-M efforts to educate, increase awareness and engagement around sustainability on campus. Second, when comparing the three group we see that greater changes occur in sustainability behaviors, awareness and attitudes between students' freshmen and junior years compared to their sophomore and senior years. This finding taken together with the presence of only a few significant changes over time among the first group (freshmen in 2014) from their freshmen to sophomore year, suggests that the most change occurs among undergraduate students in between their sophomore to junior years. Such findings provide useful information about when may be the best time to provide sustainability educational and engagement opportunities to undergraduate students. Alternatively these findings could suggest that it takes time (e.g., more than one year) for sustainability behaviors, awareness, and attitudes to change substantively among undergraduate students. This would suggest then a need to provide sustainability education and engagement opportunities as early as possible, e.g., during students' freshmen year, but with an understanding that observable and significant change may not occur until their junior year.

Summary of Panel Indices

Across all three groups of undergraduate students in the panel covered in Table 21, the data indicate that:

First, individual student behavior in conservation activities decreased over time.

Second, the use of sustainable travel/transportation options by individual students increased over time.

Third, student engagement in waste prevention increased the longer they were at the University.

Fourth, the longer students were at U-M, the more they know about Ann Arbor's travel and transportation options.

Fifth, individual student understanding of sustainable foods and U-M's sustainability initiatives has not changed over time.

Sixth, students in the panel were more engaged in sustainability both on campus and off campus over time. Similarly, they expressed a greater commitment to sustainability as their time at U-M increased.

Finally, students became more critical of the U-M sustainability initiatives the longer they were at the University.

Table 21

STUDENT PANEL SUSTAINABILITY INDICES - 2014-2018

(mean scores)

INDICES	Undergraduate Panel						
	Fr 2014	Soph 2015	Sr 2018	Fr 2015	Jr 2018	Soph 2015	Sr 2018
PRIMARY							
Climate Action							
Conservation Behavior	6.2	6.1	6.0	5.9	5.7 ▼	5.9	5.8
Travel Behavior	7.8	8.6 △	8.2	7.8	8.2 △	8.4	8.1
Waste Prevention							
Waste Prevention Behavior	6.8	7.0 △	7.2 ▲ ⬆	6.9	7.1 △	7.1	7.2
Health Environments							
Sustainable Food Purchases[a]	5.9	5.5	4.8	4.8	5.1	5.5	5.5
Community Awareness							
Sustainable Travel & Transportation	3.4	3.6	4.5 ▲ ⬆	3.4	4.5 ▲	3.7	4.7 ▲
Sustainable Foods	4.3	4.6	4.7	4.3	4.5	4.5	4.6
U-M Sustainability Initiatives	5.9	5.9	6.1	5.7	5.5	5.8	5.6
SECONDARY							
Sustainability Engagement at U-M-2	-	2.1	2.4	0.7	1.8 ▲	1.4	2.2 ▲
Sustainability Engagement Generally	2.3	2.1	3.2 ▲ ⬆	2.0	2.8 ▲	2.2	3.1 ⬆
Sustainability Commitment	6.3	6.6	6.8 ⬆	6.3	6.7 △	6.6	6.8
Rating U-M Sustainability Initiatives	7.1	6.6 ▼	6.2 ▼ ⬇	7.0	6.3 ▼	7.0	6.5 ▼
number of respondents[a]		195		414		133	

[a] Most U-M freshmen live in residence halls and therefore were not asked questions about purchasing sustainable foods. Only 8 of the 2014 freshmen and 20 of the 2015 freshman selected to participate in the panel answered questions about sustainable food purchases. Therefore statistical analyses to examine the significance of change were not examined for this index.

▲ **significant change from previous year (p<.001)**
⬆ **significant change from previous year (p<.01)**
△ **significant change from previous year (p<.05)**
▲ **significant change from 2014 (p<.001)**
⬆ **significant change from 2014 (p<.01)**
⬆ **significant change from 2014 (p<.05)**

Summary of Indices by Campus and Region

The sustainability indicators can be summarized in other ways based on the interests of administrative and operations personnel representing different units within the University.[47] One way is to determine if and how indicators differ for university employees (staff and faculty) working in buildings in different parts of the U-M Ann Arbor campus. That is, index scores can be calculated for staff and faculty whose primary work place is on different campuses and in different regions making up the U-M.[48] Table 22 summarizes indicators for respondents (staff and faculty together) by the campus or region containing the building where they have their primary office or place of employment. It should be noted that the numbers of respondents from buildings in the Ross Athletic Campus and from East Campus buildings are relatively small and therefore the index scores are estimates with large errors (see Appendix F, Figures F5 and F6).

For the most part, there are variations in the 2018 scores across the different parts of the University. For example, many of the index scores for the Medical Campus and East Campus employees tend to be lower than scores for employees in other parts of U-M. It is not surprising to see that the travel behavior index scores are higher (better) for employees working the two Central Campus regions and the Health Services region than those working elsewhere. As in previous years, faculty and staff working in the Ross Athletic Campus are most engaged in campus sustainability activities Nonetheless, the engagement among all staff and faculty throughout the University remains low.

Table 22 also shows where there are other significant changes in the index scores from 2012 and from 2015.[49] For instance, travel behavior scores among central campus and north campus employees declined since 2012 indicating that there are fewer walkers, bikers, and moped drivers in 2018.[50] Additionally, waste prevention behavior improved among Central Campus-West and North Campus employees and declined among East Campus employees. Finally, Medical Center employees purchased more sustainable foods in 2018 than in 2012.[51]

[47] Academic researchers may also be interested in examining indicator data for subgroups of respondents such as their gender, length of time at the University, employment status, or other attributes covered in the questionnaires.

[48] Regions are defined by the U-M Plant Operations Team for administrative/operational purposes. Several buildings within the Health Sciences region are often included in as part of the Medical Campus. With few exceptions, the number of respondents from individual buildings on the Ann Arbor campus is too small to make reasonably precise statistical estimates for indicators in each building. Accordingly, buildings have been geographically grouped into campuses, regions, and sub-regions for analysis purposes.

[49] Significance levels are based on scores and number of respondents in each year. These are shown in Appendix Tables E4 and E5.

[50] This change may reflect the timing of the survey. The 2018 survey was administered during the winter term whereas earlier surveys were administered in the fall.

[51] Differences between sub-regions for the 2018 indicators have also been examined and are shown in Appendix Table E3. In a few instances, the indicator scores of the two sub-regions are significantly different.

Table 22

SUMMARY SUSTAINABILITY CULTURAL INDICATORS for STAFF/FACULTY, by CAMPUS AND REGION

(mean scores & change from 2012 and 2015)

2018	Central Campus West	Central Campus East	North Campus	Medical Campus	Health Sciences	Ross Athletic Campus*	East Campus
PRIMARY							
Climate Action							
Conservation Behavior	**6.9**	**7.0**	**7.2**	**5.8**	**6.7**	**7.0**	**6.1**
Number of respondents	250	186	198	342	218	35	66
Travel Behavior	**2.3** ↓	**2.2** ↓▼	**0.8** ↓▼	**1.3**	**2.3**	**0.6**	**0.3**
Number of respondents	251	182	199	357	217	36	65
Waste Prevention							
Waste Prevention Behavior	**7.6** ↑	**7.7**	**7.8** ⬆	**6.7**	**7.5**	**7.7**	**6.9** ↓▼
Number of respondents	254	188	203	358	221	36	66
Healthy Environments							
Sustainable Food Purchases	**6.2**	**6.1**	**6.1**	**6.0** ↑	**6.0**	**5.6**	**6.0**
Number of respondents	237	178	191	351	216	32	62
Community Awareness							
Sustainable Travel & Transportation	**3.5**	**3.4**	**3.1** ↓	**2.7**	**3.6**	**3.5**	**2.4**
Number of respondents	251	186	203	360	221	36	66
Sustainable Foods	**5.5**	**5.2**	**5.3**	**4.9**	**5.0**	**4.7**	**4.2**
Number of respondents	252	188	203	364	221	36	66
U-M Sustainability Initiatives	**5.7**	**5.2**	**5.9** ↑▲	**5.2**	**5.7**	**6.3**	**4.8** ↓
Number of respondents	252	188	202	362	221	36	66
SECONDARY							
Sustainability Engagement at U-M-2	**1.4**	**1.3**	**1.2**	**0.3** ▼	**0.8** ▼	**2.2**	**0.6**
Number of respondents	248	186	199	358	219	36	63
Sustainability Engagement Generally	**3.0**	**3.1** ↑▲	**3.0** ↑▲	**2.3** ⬆▲	**2.7** ▲	**2.4**	**2.5**
Number of respondents	252	187	202	361	219	35	66
Sustainability Commitment	**7.1**	**7.3**	**7.2** ⬆▲	**6.4** ↑	**7.3** ⬆	**6.6**	**6.7**
Number of respondents	252	188	203	363	221	36	65
Rating U-M Sustainability Initiatives	**6.7**	**6.5**	**6.8**	**6.7**	**6.6**	**7.1**	**7.0**
Number of respondents	185	132	168	265	184	31	47

*** Ross Athletic Campus was formerly referred to as South Campus.**

Significant changes are based on analyses the of the 2018 and 2015 mean scores shown in Appendix E, Table E2

⬆ significant change from 2012 (p<.001)

⬆ significant change from 2012 (p<.01)

↑ significant change from 2012 (p<.05)

▲ significant change from previous year (p<.001)

▲ significant change from previous year (p<.01)

▲ significant change from previous year (p<.05)

E. NEW SCIP INITIATIVES

Earlier, it was mentioned that this report differs from previous SCIP reports. Specifically, its findings are derived from questionnaires administered during the winter semester, 2018, whereas findings from previous SCIP reports are based on questionnaires administered during the fall semester. This change required some modification to question wording in the 2018 questionnaires. While we suspect that these changes may have had some impact on participant responses to selected questions, we are unable to systematically assess these impacts at this time.

Other modifications to the questionnaires were also made. Some were minor whereas others reflect new SCIP initiatives. These include the addition of questions designed to measure sustainability literacy among students, questions used to assess new sustainability initiatives, and questions aimed at exploring faculty and staff receptivity to a potential new transportation initiative at U-M.[52]

Measuring Sustainability Literacy

A new set of questions added to the student questionnaires (cross section and panel) in 2018 focused on sustainability literacy. This was done for two reasons. First, it provides a better understanding of the impact of various educational sustainability initiatives (formal and non-formal) at U-M. Second, it responds to the new AASHE STARS rating criteria of measuring sustainability literacy. Between 2012 and 2015, SCIP focused primarily on sustainability awareness and behaviors. No questions were asked involving the identification of "correct" answers, as would a series of sustainability literacy questions. That is, SCIP had no mechanism to assess the impact of various formal educational offerings (courses, minor, majors) and non-formal offerings (residential programming, the Planet Blue Ambassador program, and other special trainings and workshops).

Rather than developing new questions, the SCIP research team used (with permission) the *Assessing Sustainability Knowledge* (ASK) questions developed and tested by researchers at Michigan State University, Ohio State University, and the University of Maryland (Zwickle et al, 2014, Zwickle & Jones 2018). Using the ASK questions also allows for cross-institution comparisons. ASK consists of 12 questions covering environmental, social, and economic topics. AASHE STARS only requires that students answer sustainability literacy questions and that changes are examined over time. The SCIP student panel will eventually fulfill that requirement The SCIP research team may consider including sustainability literacy questions on the staff & faculty questionnaire in the future if there is a clear rationale.

Below is a summary of ASK student responses. Complete findings can be found in Appendix Tables C13, E6, and E7.

- The number of correct responses to the 12 questions was 7.4 on average. The mean for

[52] In order to accommodate new questions without substantially increasing questionnaire length, selected questions from earlier survey were eliminated from the 2018 questionnaires. These included the series about protecting the natural environment (most of which addressed activities at one's residence) and questions dealing with an individual's disposition to behave in a sustainable manner. Such questions have been relegated to a questionnaire bank and may be asked again in future SCIP surveys.

undergraduate was 7.0 and for graduate students, the mean was 8.0.[53]

- For 11 of the 12 questions the highest percentage of respondents selected the correct answer. The one question that did not fit this pattern is about the depletion of fish stocks.
- For 7 of the 12 questions the correct answer was selected by more than half of the respondents.
- More than 80 percent of respondents selected the correct answers for questions about the ozone layer, wealth disparity, and the country that is the largest emitter of the greenhouse gas carbon dioxide.
- More than 30 percent of the students reported that they did not know the answers to questions about electricity prices and the definition of economic sustainability.
- Results from students participating in the panel were similar to the cross section of students; but overall they gave more correct answers than non-panel respondents.
- For all of the 12 questions the highest percentage of panel respondents selected the correct answer.

The sustainability literacy questions will be repeated in subsequent SCIP student surveys enabling U-M to assess changes, if any over time.

Assessing New Sustainability Initiatives

In recent years, new sustainability initiatives aimed at meeting U-M sustainability goals have been introduced in two ways. One involves a major program or initiative such as the installation of a natural gas cogeneration turbine in the Central Power Plant or the 2017 Zero Waste Program at the U-M stadium. The other way involves a more incremental approach. In many cases, a behavioral component to both approaches should be considered in assessing the effectiveness or impact of the initiative.

The Zero Waste Program at the U-M stadium is an example of the first type of initiative. From an operational perspective, the program was successful in that 88 percent of the total waste generated inside the stadium was diverted to compost and recycling. But how has it worked from a behavioral perspective and in terms of community awareness?

As part of the 2018 questionnaires, students, staff, and faculty respondents were asked about their awareness of the program and whether or not they participated in it. They were also asked about the number of football games they attended during the season. As reported earlier, the more games respondents attended, the more they were aware of the program and the more they participated in it. However, the data suggest that there are opportunities for Michigan Athletics to improve its zero-waste program and build on its success during its first year.

When asked how aware they were of the program's existence, just 6 in 10 students who attended most (5-6) football games said they were "very aware" or "somewhat aware". Among the same group of student attendees, just one in 3 said they had disposed of their waste in the proper way.

Data covering faculty and staff were somewhat better but also reveal room for program improvements. Among staff and faculty respondents who attended 5-6 games, 8 in 10 said they were "very aware" or

[53] The distribution of correct responses for each class of students is shown in Appendix Table E7.

"somewhat aware" of zero waste.at the stadium. Yet, just half of these frequent attendees said they had disposed of waste in the manner that Michigan Athletics had hoped.

Asking the same set of questions in future SCIP surveys and measuring the total waste recycled and composted will determine if and by how much the program at the U-M stadium is moving toward true zero waste.

The Zero Waste Program during the football season represents a major sustainability initiative that can be monitored from a behavioral perspective and enhanced in future years. But as noted, there are other sustainability programs or new initiatives related to U-M's sustainability goals that are implemented incrementally. These new initiatives could be viewed as experiments or tests to determine their effectiveness. If they are effective, they can then be expanded. The composting experiment at the Bursley residence hall is an example.

The Bursley Composting Experiment (pilot) launched in winter 2016 was initiated in response to recommendations put forth in a 2015 presidential report on waste reduction. According to the report, "composting, the managed decomposition of organic material into a nutrient-rich soil amendment, is an integral component to reaching the University of Michigan's waste reduction goal".[54] At that time, only a small amount of the University's compostable waste was diverted from landfills. Much of that waste was food scraps coming from dining facilities in residence halls. In efforts to expand composting beyond the dining halls into other parts of the students' living-learning environment, it was decided to launch a pilot or experimental program for one semester in Bursley, one of the University's largest residence halls.

The pilot program was planned and implemented by a team of Planet Blue Student Leaders under the guidance of key staff from the Division of Student Affairs (DSA) and the Graham Institute. SCIP data re: composting collected in fall 2015 represent a baseline against which subsequent data would be compared. Because of the limited number of Bursley residents who participated in the experiment, it was decided to continue the experiment through the 2016-2017 academic year. The evaluation would involve identifying the 2016 Bursley residents and 2017-18 Bursley residents in the 2018 questionnaire and querying them about their composting experiences and awareness. That is, in addition to finding out where specifically residence hall students lived, the 2018 survey asked sophomores whether or not they lived in Bursley Hall during their first year on campus. The Bursley responses would then be compared with responses from student participants who lived in other U-M residence halls.

When comparing the 2015 student respondents in residence halls with the 2018 residence hall respondents, the data are inconclusive. In 2015 prior to the introduction of composting, Bursley residents were more knowledgeable about composting and U-M's effort to promote it. And they were more likely to compost food scraps than survey respondents living in other U-M residence halls. Similarly, the 2018 Bursley respondents once again were more aware of composting and more likely to compost than respondents in other residence halls. The major conclusion drawn from these analyses is that there has been and continues to be more of a culture of sustainability within Bursley (at least with respect to composting) than at other U-M residence halls.[55] An alternative explanation is that first year students moving into Bursley are more sensitive to composting and other sustainability issues than first year

[54] The U-M report covering waste reduction can be found at:
http://sustainability.umich.edu/media/files/Landfill-Waste-Reduction-Committee-Report-2015.pdf

[55]Using data from the 2018 and earlier surveys, this conclusion could be tested by comparing responses for other aspects of sustainability besides composting for Bursley respondents with responses of residents in other residence halls.

students moving into other residence halls. Testing for these possibilities can be determined through further analyses of the SCIP data.

Additional analysis of data covering composting for Bursley residents in 2016 when the experiment was underway and students in other residence halls show more conclusive evidence that the experiment had a positive effect. For example, nearly 4 in 10 sophomores who lived in Bursley in 2016 said they know "a lot" or "a fair amount" about composting compared to less than 3 in 10 (28 percent) sophomores who lived in other residence halls during their freshman year.

Similarly, more than half (52 percent) of the 2016 Bursley residents " sometimes" or "almost always" composted waste scraps compared to 43 percent of sophomores living other residence halls during their first year at U-M. Finally, former Bursley residents were more likely to know about U-M composting initiatives than residents of other residence halls (71 percent versus 64 percent).

Based on these analyses, it appears that the Bursley pilot or experiment composting initiative has been effective. Yet the numbers suggest that there are still opportunities to enhance the program as it expands to other U-M residence halls. This might be achieved through marketing efforts during freshmen orientation and throughout the first semester.

Possibilities for Further Pilot Studies. Because of the longitudinal nature of SCIP, survey data could be used to evaluate other new initiatives and pilot studies. That is, SCIP data collected before an initiative is launched and afterwards could reveal if and by how much change has occurred in selected behaviors or levels of awareness re: energy conservation, waste reduction, or environmental protection. The relatively large numbers of students, faculty and staff respondents from each SCIP survey and their distribution in different campuses, regions, sub-regions and buildings also lends itself to conducting experiments or trials. In other words, these experiments or pilot efforts could be initiated in one or two places such as a sub-region or building over a period of time (i.e. a semester, an academic year, a calendar year) but not in other sub-regions or buildings. Thus, two conditions exist for conducting evaluating these pilot initiatives—having data before and after an intervention and having data from a control group of people against which data from an experimental group can be compared.

There is justification for considering experimental or pilot sustainability initiatives and using SCIP as a vehicle in their assessing their impacts. For more than a decade, U-M has launched numerous sustainability programs designed to conserve energy, reduce waste, change behaviors of students, faculty, and staff, and raise levels of awareness. In some cases, the programs have proved successful and continue to flourish. In other instances, they have been discontinued. The "Use Your Power Wisely" signage in 2005 is an example of the latter. Had a pilot experiment been tried and tested in a few buildings rather than implementing the program throughout the entire University, there could have been a considerable savings in money and staff resources.

In the coming months, the SCIP team will work with the Office of Campus Sustainability and other operational units to identify other possible pilot initiatives or experiments aimed at enhancing the culture of sustainability on campus. SCIP offers opportunities to assist in evaluating these initiatives.

Testing Receptivity to New Sustainability Initiatives

Another benefit of SCIP is the opportunity to test or measure the degree to which potential new U-M sustainability initiatives would be accepted or used by members of the U-M community. This is demonstrated in the 2018 questionnaire administered to faculty and staff. Based on the interests of U-M faculty and the U-M's Office of Logistics, Transportation, and Parking, a series of questions was asked about carpooling or ride sharing and conditions under which it would be accepted.

As reported earlier, most faculty and staff drive to/from campus each day. When asked *How do you most often travel to/from home to your workplace*?, more than 4 in 5 staff and about three-quarters of the faculty said "drive a car*"*. About half of the staff and four-fifths of the faculty who drive said they park in a gold/blue parking lot or structure. And when asked, *On a typical day, how easy is it to find a parking space?* About a third from both groups said it was "Not very easy" or "Not at all easy". Under the circumstances, one would expect that among many viable alternative modes for staff and faculty travel to/from work, carpooling would be attractive to some U-M employees.

Accordingly, staff and faculty were asked, *If U-M expanded and improved its carpool service and incentivized its use, how likely would you be to use it?* Responses differed for staff and faculty. Among the staff, 3 in 10 said they were "very likely" or "somewhat likely" to use it while a quarter said they "unsure". About half as many faculty respondents said they were likely to use it and a fourth of them were "unsure".

While these proportions may appear small, the actual number of potential university employees who might use an expanded carpooling program at U-M is significant. For instance, among the estimated 31,212 staff who drove to/from work, 29 percent or 9,051 would seriously consider carpooling. Similarly, an estimated 890 faculty members who now drive to work would likely carpool if an expanded and incentivized program were initiated.[56] Further analyses of the SCIP data including the home and work locations would be useful in determining the feasibility of launching such a program, even on a trial basis. An expanded and incentivized carpooling program is one of many potential new sustainability initiatives that directly impact on the actions of members of the U-M community. It would involve considerable expense and extensive planning before it became operational. There are no doubt other potential new initiatives that would affect U-M's sustainability culture. In the future, consideration should be giving to exploring their potential using SCIP.

[56] These estimates on based on the total number of faculty and staff employed as of January 2018 and the SCIP proportion of drivers from each group that were asked the hypothetical carpooling question.

F. NEXT STEPS

SCIP is multi-year project designed to measure and track the *culture of sustainability* on the Ann Arbor campus of the University of Michigan. This report covers findings from the fifth year including cultural indicator scores and their changes, if any that occurred since the initial survey in 2012. These changes do not represent trends nor do they portray an overall shift in sustainability culture on campus. They simply represent individual components of an overall culture that may have shifted since the initial SCIP surveys in 2012.

Following the 2015 surveys, the intent was to conduct future SCIP surveys in alternate years. That is, the current survey was originally planned for fall 2017 with subsequent surveys taking place in the fall of 2019, 2021, and so forth.[57]

In part, the decision to move to an every other year survey was influenced by budgetary constraints. But it also reflected the realization that cultural change is a slow and complex phenomenon. During the remainder of this academic year, the SCIP team will continue to review findings with U-M's operational personnel and administrators. These meetings will likely lead to further analyses of the data as well as modifications to the questionnaires to be used in subsequent SCIP surveys. The meetings may also suggest possible changes to U-M initiatives intended to bring about cultural change on campus.

On-Going Analysis of Data

As mentioned earlier, findings presented in this report are primarily descriptive showing differential responses among the U-M's students, staff, and faculty. It is expected that the data from 2018 and from earlier years will be further examined in order to address questions posed by operations personnel, test new hypotheses, and consider factors that may be associated with individual question responses, indicator scores, or changes in either. In fact, this is currently being conducted through a required social sciences course (NRE 510) for all first year students in the School of Environment and Sustainability. In addition, several graduate students have used and are using SCIP data for their dissertation and other research.

Plans are also being made to use the panel data to identify antecedent conditions that affect individual changes in behavior and levels of awareness. For instance, early panel data have been used to examine student engagement in University sustainability activities and factors influencing change (if any) in engagement from one year to the next. Preliminary findings show that students who lived for at least one year in a residence hall as well as those who lived with more people were more likely to be engaged in sustainability activities than those who lived off-campus over a two-year period. The analyses also show that higher levels of student engagement are associated with increases in awareness of waste prevention activities on campus which in turn, are associated with increases in waste prevention and conservation behaviors. There are numerous other opportunities for examining changes in other types of student behaviors and to identify their causes using the SCIP panel data. Panel data will also be used to further understand the dramatic shift in views on climate change.

[57] As noted earlier, the survey was shifted to the winter term due to another large campus survey initiatives scheduled for fall 2017.

It is also possible to analyze cross-sectional data covering faculty and staff to explore other questions of interest to researchers and operations personnel. For example, the data can also be examined to see if there are differential indicator scores for students and faculty associated with different academic units on campus.[58] While the pursuit of many of these analyses will be determined by the research team, others will emanate from questions posed by potential users of the findings. These users include U-M administrators and staff associated with the Office of Campus Sustainability, University Housing, Logistics, Parking and Transportation, Michigan Medicine, Food Services and others. Similarly, faculty members who teach and/or conduct research covering one or more facets of sustainability may want to mine the data for nuggets of needed information. Finally, the data offer a rich resource for graduate students throughout the University who are looking for thesis or dissertation topics. In anticipation of requests for the many uses of the data, mechanisms are available for individuals to make inquiries about the data and access them.[59]

Plans are also being made to analyze SCIP data in conjunction with contextual or environmental data derived from other sources. In earlier SCIP reports, we have taken an initial look at data collected by the Office of Campus Sustainability covering individual buildings clustered into campuses and sub-regions[60] The data correspond to survey data collected during the same time period. We have also examined changes in selected environmental indicators and considered them in relation to changes in our behavioral indicators. These data cover energy use, carbon emissions, recycled material and trash. In the months ahead, we expect to examine other types of environmental information vis-à-vis the survey data.[61] In future years when more SCIP data become available, it is expected that we will be able to model how changes in environmental conditions impact changes in behaviors and vice versa. For example, it should be possible to develop models showing how an X change in conservation behavior on campus results in a Y savings in annual energy costs. Similarly, modeling the effects of increased campus waste prevention behavior on tonnage of recycled material is possible.

Dissemination

Because of the groundbreaking nature of SCIP, its relationship to the many U-M initiatives designed to promote sustainability throughout the University and its importance in addressing cultural issues and behavioral change when dealing with complex and pressing environmental problems, we continue to promote the replication of SCIP elsewhere. We believe that such efforts will be beneficial to other universities and colleges as well as to other types of institutions, corporations, and cities where movements toward a more sustainable future are taking place. It is our belief that in order for those movements to move more rapidly and be successful, consideration needs to be given to shifting toward a culture of sustainability within each organization. The University of Michigan is doing so as part of its overall sustainability efforts and SCIP is the vehicle for assessing its impacts and measuring progress.

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[58] Preliminary analysis of panel data covering engagement indicates that students in the social sciences were most likely to be engaged in sustainability activities on campus whereas those in humanities were least likely to participate in sustainability activities.

[59] Procedures to follow in requesting SCIP datasets are described on program website at http://graham.umich.edu/leadership/scip/materials.

[60] See http://sustainability.umich.edu/report/2013/ and http://www.ocs.umich.edu/reporting.html.

[61] Furth discussions are planned with staff from the Office of Campus Sustainability the Graham Sustainability Institute and others in order to a) identify other types of environmental phenomena that might be associated with levels of awareness and behaviors and b) the availability of data covering these phenomena for buildings and regions on campus.

Accordingly, we are eager to share our work with interested parties in several ways. First, material presented in this and other reports is available on the web.[62] Second, we continue to discuss our work at professional and academic meetings and will continue to do so in the months ahead. During the past few years, we presented an overview of SCIP and findings at venues in India, Ireland, Taiwan, Brazil, Great Britain, Sweden, China, Saudi Arabia, and Jordan in addition to groups throughout the U.S. Additionally, SCIP was a focus of discussion at a U-M symposium on sustainability and social science research in May 2017.[63] In addition, two short animated videos prepared in 2015 will continue to be used to succinctly describe SCIP. One is aimed at external audiences such as other universities, corporations, and cities while the second will be used within U-M. Finally, the Graham Institute will continue to be available to address questions concerning the process used in carrying out SCIP, its experiences in communicating findings to University officials and others, and in the ways in which the work has contributed to decision making in University operations and teaching on campus.

[62] See: http://www.graham.umich.edu/leadership/scip. The website also includes copies of the 2018 questionnaires.
[63] The papers presented at the symposium can be found in Leal Filho, Marans and Callewaert, (eds), Handbook of Sustainability and Social Science Research, Berlin: Springer, 2018.

APPENDICES

Appendix A: Methodology

A complete methodology report covering 2018 and previous years can be found online at: http://graham.umich.edu/campus/scip/materials.

Appendix B: Demographic Characteristics of the Respondents

In addition to asking about their status at U-M, their place of residence, housing situation (students only) and where within the campus they studied or worked, students, staff, and faculty were asked a limited number of demographic questions that may be associated with their responses to the substantive questions about sustainability. The demographic questions about gender and age were also asked to ensure that the sample represented all segments of the student and U-M employees. The distributions of responses to the student and staff-faculty demographic questions are shown below. Demographic characteristics of the 2018 respondents are similar to characteristics of those who responded in previous years.

Appendix Table B1

STUDENT DEMOGRAPHIC CHARACTERISTICS

(percentage distribution)*

2018	All Students	Undergraduate Students					Graduate Students
		Fresh	Soph	Junior	Senior	All	
Gender							
Female	48	50	52	47	50	49	46
Male	49	49	46	51	48	49	50
Other	1	**	1	1	-	1	**
Chose not to respond	2	1	1	1	2	1	4
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**
Age of student							
17-19	30	98	67	3	0	48	0
20-21	29	2	33	89	55	40	1
22-23	13	0	**	5	40	10	22
24 and older	28	**	**	3	5	2	77
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**
Mean Age (based on year of birth)	**21.9**	**18.5**	**19.4**	**20.8**	**21.7**	**19.9**	**26.7**
Race/Ethnicity							
African American/Black	8	9	10	10	6	6	8
Asian American/Asian	22	21	20	22	21	21	26
Hispanic/Latino/a	6	6	7	5	4	6	5
Middle Eastern/North African	3	3	3	4	5	4	3
Native America/ Alaskan Native	**	1	**	1	**	1	**
Native Hawaiian/Other Pacific Islander	**	**	**	**	**	**	**
White	54	56	55	55	58	56	51
Other***	7	4	5	3	6	6	15
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**

*** Percentage distributions are based on the weighted number of respondents to each question. The actual number of respondents for each question differs since not all questions were answered by all respondents. The maximum number of respondents for each group of students is shown below.**

Number of respondents	2355	911	328	373	339	1951	400

**** Less than one half of one percent.**

***** Includes various combinations of the above racial/ethnic categories.**

Appendix Table B2

STAFF/FACULTY DEMOGRAPHIC CHARACTERISTICS

(percentage distribution)*

2018	Staff	Faculty
Gender		
Female	66	41
Male	30	56
Chose not to respond	4	3
Other	**	0
Total	**100**	**100**
Number of respondents	690	724
Age of respondent		
Under 25	3	0
25-29	11	2
30-39	27	23
40-49	22	27
50-59	26	24
60-69	11	20
70 and older	**	4
Total	**100**	**100**
Median Age	**41.1**	**48.7**
Number of respondents	680	722
Educational Attainment		
High school graduate or less	2	0
Some college	18	**
College graduate	45	**
Graduate or professional degree	35	100
Other	**	0
Total	**100**	**100**
Number of respondents	684	730
Household Income (2017)		
Less than $50,000#	19	2
$50,000-74,999	21	8
$75,000-$99,999	18	9
$100,000-$149,999	25	20
$150,000-$199,999	11	21
$200,000 or more	6	40
Total	**100**	**100**
Median Household Income (2017)	**$ 83,900**	**$ 173,800**
Number of respondents	651	684

****Less than one half of one percent.**

*** Percentage distributions are based on the weighted number of respondents to each question. The actual number differs since not all questions were answered by all respondents.**

Appendix C: Response Distribution Tables for 2018

The following tables show complete survey responses to all questions dealing with travel and transportation, waste prevention and conservation, food, climate change, engagement, U-M sustainability initiatives, and sustainability literacy. Responses to demographic questions are shown in Appendix B.

Appendix Table C1

TRAVEL & TRANSPORTATION - AWARENESS

(percentage distribution)*

2018	All Students	Undergraduate Students					Graduate Students	Staff	Faculty
		Fresh	Soph	Junior	Senior	All			
How much do you know about:									
AAATA/"The Ride"									
A lot	17	9	10	12	10	10	33	12	18
A fair amount	29	24	27	30	29	28	31	20	22
A little	32	40	39	30	35	36	22	33	29
Not much/nothing	22	27	24	28	26	26	14	35	31
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**
U-M buses									
A lot	42	43	47	44	48	45	35	14	11
A fair amount	31	32	30	33	30	31	29	27	24
A little	17	16	15	17	14	16	20	34	34
Not much/nothing	10	9	8	6	8	8	16	25	31
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**
Biking in Ann Arbor									
A lot	8	4	6	7	7	6	13	6	16
A fair amount	17	12	15	20	18	16	21	14	22
A little	35	32	33	39	36	34	34	29	28
Not much/nothing	40	52	46	34	39	44	32	51	34
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**
Hourly car rental - Zipcar									
A lot	6	2	4	7	7	5	10	1	4
A fair amount	8	3	6	8	6	6	13	4	5
A little	22	16	22	24	22	20	23	16	22
Not much/nothing	64	79	68	61	65	69	54	79	69
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**
Hourly car rental- Maven									
A lot	3	2	3	4	3	3	2	1	2
A fair amount	3	3	3	4	2	3	3	1	1
A little	13	9	13	17	11	12	13	8	6
Not much/nothing	81	86	81	75	84	82	82	90	91
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**
U-M Vanpools									
A lot								3	1
A fair amount								10	2
A little								36	20
Not much/nothing								51	77
Total								**100**	**100**

Appendix Table C1 (continued)

TRAVEL & TRANSPORTATION - AWARENESS

(percentage distribution)*

2018	All Students	Undergraduate Students					Graduate Students	Staff	Faculty
		Fresh	Soph	Junior	Senior	All			
How much do you know about:									
U-M Greenride Connect									
A lot	0	1	**	0	**	0	1	0	0
A fair amount	1	1	1	2	1	1	1	2	1
A little	5	4	7	7	2	5	5	8	5
Not much/nothing	94	94	92	91	97	94	93	90	94
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**
U-M Emergency Ride Home/ TapRide									
A lot	3	3	3	6	2	3	3	2	1
A fair amount	11	13	13	13	9	12	7	5	3
A little	33	38	33	33	38	36	27	25	19
Not much/nothing	53	46	51	48	51	49	63	68	77
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**
Arbor Bike									
A lot	1	1	1	1	2	1	1	3	1
A fair amount	5	4	4	8	6	5	4	**	3
A little	19	14	19	21	24	19	20	12	14
Not much/nothing	75	81	76	70	68	75	75	85	82
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**
On Demand Transportation (Uber or Lyft)									
A lot	42	37	37	45	52	42	42	12	19
A fair amount	30	30	32	29	26	30	31	21	26
A little	19	21	22	17	15	19	18	29	29
Not much/nothing	9	12	9	9	7	9	9	38	26
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**

*** Percentage distributions are based on the weighted number of respondents to each question. The actual number of respondents for each question differs since not all questions were answered by all respondents. The minimum number of respondents for each group of students and for faculty and staff is shown below.**

**** Less than one half of one percent.**

Number of respondents	3029	1250	733	341	265	2595	432	766	747

Appendix Table C2

TRAVEL & TRANSPORATION - BEHAVIOR

(percentage distribution)*

2018	All Students	Undergraduate Students					Graduate Students	Staff	Faculty
		Fresh	Soph	Junior	Senior	All			
During the past year, how often did you do the following to travel between where you lived and campus:									
Drive a car and park on campus									
Never	49	75	63	42	33	56	34		
Rarely	20	15	19	25	19	19	22		
Sometimes	19	7	13	22	34	17	23		
Always/Most of the time	12	3	5	11	14	8	21		
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**		
Park and ride									
Never	74	75	75	73	76	74	74		
Rarely	12	11	11	11	13	12	11		
Sometimes	9	8	9	10	7	9	9		
Always/Most of the time	5	6	5	6	4	5	6		
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**		
Walk									
Never	11	6	6	6	7	6	25		
Rarely	6	2	2	4	4	3	13		
Sometimes	14	9	8	11	13	10	22		
Always/Most of the time	69	83	84	79	76	81	40		
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**		
Bike									
Never	72	82	73	66	72	74	68		
Rarely	10	6	10	15	11	10	11		
Sometimes	12	8	12	12	12	11	14		
Always/Most of the time	6	4	5	7	5	5	7		
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**		
Take an AAATA bus/ "The Ride"									
Never	50	53	52	58	64	56	36		
Rarely	22	29	26	21	18	23	19		
Sometimes	16	13	15	13	11	14	21		
Always/Most of the time	12	5	7	8	7	7	24		
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**		
Take a U-M bus									
Never	25	13	15	21	23	18	43		
Rarely	18	18	19	20	20	19	16		
Sometimes	23	26	25	23	27	25	18		
Always/Most of the time	34	43	41	36	30	38	23		
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**		

Appendix Table C2 (continued)

TRAVEL & TRANSPORATION - BEHAVIOR

(percentage distribution)*

2018	All Students	Undergraduate Students					Graduate Students	Staff	Faculty
		Fresh	Soph	Junior	Senior	All			
During the past year, how often did you do the following to travel between where you lived and campus:									
Carpool									
Never	58	64	57	55	50	57	62		
Rarely	25	22	26	25	24	24	25		
Sometimes	15	12	15	18	21	17	12		
Always/Most of the time	2	2	2	2	5	2	1		
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**		
Use U-M Greenride Connect									
Never	98	98	98	99	99	98	98		
Rarely	1	1	1	1	1	1	2		
Sometimes	1	1	**	**	**	**	**		
Always/Most of the time	**	**	1	**	**	1	**		
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**		
Vanpools									
Never	98	98	98	98	99	98	97		
Rarely	2	1	1	2	1	1	2		
Sometimes	**	1	1	**	**	1	**		
Always/Most of the time	**	**	**	**	**	**	1		
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**		
Use motorcycle, moped, or scooter									
Never	96	97	95	97	97	97	95		
Rarely	2	1	2	2	1	2	3		
Sometimes	1	1	2	1	1	1	1		
Always/Most of the time	1	1	1	**	1	0	1		
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**		
On-demand transportation (Uber or Lyft)									
Never	44	37	41	40	36	38	57		
Rarely	30	30	31	30	33	31	29		
Sometimes	23	29	24	27	26	27	13		
Always/Most of the time	3	4	4	3	5	4	1		
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**		

Appendix Table C2 (continued)

TRAVEL & TRANSPORATION - BEHAVIOR

(percentage distribution)*

2018	All Students	Undergraduate Students					Graduate Students	Staff	Faculty
		Fresh	Soph	Junior	Senior	All			
During the past year, how often did you do the following travel to/from your home and your U-M workplace?									
Drive a car									
Never								6	7
Rarely								7	10
Sometimes								9	11
Always/Most of the time								78	72
Total								**100**	**100**
Park and Ride									
Never								72	86
Rarely								10	8
Sometimes								10	5
Always/Most of the time								8	1
Total								**100**	**100**
Walk									
Never								79	58
Rarely								7	15
Sometimes								9	16
Always/Most of the time								5	11
Total								**100**	**100**
Bike									
Never								90	72
Rarely								4	9
Sometimes								4	12
Always/Most of the time								2	7
Total								**100**	**100**

Appendix Table C2 (continued)

TRAVEL & TRANSPORATION - BEHAVIOR

(percentage distribution)*

2018	All Students	Undergraduate Students					Graduate Students	Staff	Faculty
		Fresh	Soph	Junior	Senior	All			
During the past year, how often did you do the following travel to/from your home and your U-M workplace?									
Take an AAATA bus/ "The Ride"									
Never								78	65
Rarely								8	14
Sometimes								8	13
Always/Most of the time								6	8
Total								**100**	**100**
Take a U-M bus									
Never								64	75
Rarely								12	13
Sometimes								14	10
Always/Most of the time								10	2
Total								**100**	**100**
Carpool									
Never								79	86
Rarely								12	10
Sometimes								6	3
Always/Most of the time								3	1
Total								**100**	**100**
Use U-M Greenride Connect									
Never								98	99
Rarely								1	1
Sometimes								0	0
Always/Most of the time								1	**
Total								**100**	**100**
U-M Vanpools									
Never								97	100
Rarely								1	**
Sometimes								1	0
Always/Most of the time								1	0
Total								**100**	**100**

Appendix Table C2 (continued)

TRAVEL & TRANSPORATION - BEHAVIOR

(percentage distribution)*

2018	All Students	Undergraduate Students					Graduate Students	Staff	Faculty
		Fresh	Soph	Junior	Senior	All			
During the past year, how often did you do the following travel to/from your home and your U-M workplace?									
Use motorcycle, moped, or scooter									
Never								96	98
Rarely								1	1
Sometimes								2	1
Always/Most of the time								1	0
Total								**100**	**100**
Worked from home/telecommuted									
Never								79	48
Rarely								13	26
Sometimes								7	26
Always/Most of the time								1	0
Total								**100**	**100**
On-Demand transportation (Uber or Lyft)									
Never								89	81
Rarely								8	13
Sometimes								3	5
Always/Most of the time								0	1
Total								**100**	**100**

Appendix Table C2 (continued)

TRAVEL & TRANSPORTATION - BEHAVIOR

(percentage distribution)*

2018	All Students	Undergraduate Students					Graduate Students	Staff	Faculty
		Fresh	Soph	Junior	Senior	All			
How do you most often travel to/from home to your work place?									
Drive a car								83	72
Walk								1	9
Bike								1	6
Ride the bus								5	6
Ride the bus and bike								1	1
Motorcycle, moped, or scooter								0	1
Park and Ride								4	2
Ride share								3	1
On-demand transportation (Uber or Lyft)								**	0
Other								2	2
Total								**100**	**100**
During fall semester, how did you most often travel to and from campus?									
Drive a car	15	10	5	12	16	10	24		
Park and ride (the bus)	2	1	1	2	2	1	4		
Walk	49	53	61	59	55	57	31		
Bike	4	2	5	5	5	4	7		
Ride the bus	24	26	22	18	16	21	29		
Ride the bus and bike	2	1	1	2	3	2	2		
Ride share	2	4	2	1	1	2	1		
Motorcycle, moped, or scooter	**	**	1	**	1	1	**		
On-demand transportation (Uber or Lyft)	1	2	**	**	1	1	1		
Other	1	1	2	1	**	1	1		
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**		
Number of respondents	1438	577	355	144	93	1169	268	707	739
In the past week, how often did you ride the bus?* **									
One day	28	28	30	29	36	30	25	40	44
Two days	11	11	12	10	19	12	10	8	12
Three days	12	12	9	19	10	12	10	6	9
Four Days	10	9	9	8	9	9	11	12	11
Five Days	39	40	40	34	26	37	44	34	24
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**
Number of respondents	1437	576	355	144	92	1197	268	125	182

* Percentage distributions are based on the weighted number of respondents to each question. The actual number of respondents (unweighted) for each question differs since not all questions were answered by all respondents. The minimum number of respondents for each group of students and for faculty and staff is shown above

** Less than one-half of one percent

*** Question was not asked of respondents who said they "never" travelled between home and campus by bus

Appendix Table C3

TRAVEL & TRANSPORTATION - OTHER

(percentage distribution)*

2018	All Students	Undergraduate Students					Graduate Students	Staff	Faculty
		Fresh	Soph	Junior	Senior	All			
Where do you most often park?									
U-M gold/blue parking lot or structure								48	84
U-M yellow parking lot								17	4
U-M orange parking lot								8	4
U-M free Park & Ride lot								3	**
AATA Park & Ride lot								1	0
Other								23	8
Total								**100**	**100**
On a typical day, how easy is it to find a parking space?									
Very easy								40	27
Somewhat easy								30	38
Not very easy								18	20
Not at all easy								12	15
Total								**100**	**100**
What do you think is the most important benefit of carpooling?									
Save money (fuel, car repair, parking, etc.)								68	38
Reduce impact on the environment								22	50
Enjoy the company of other while commuting								2	3
Get some added sleep/rest								2	2
Other								6	7
Total								**100**	**100**
If U-M expanded and improved carpool service and incentivized its use, how likely would you be to use it?									
Very likely								9	4
Somewhat likely								20	10
Unsure. Don't know								26	18
Not very likely								24	27
Not at all likely								21	41
Total								**100**	**100**
Number of respondents								**622**	**544**
What is the primary reason you drive a car to work?*									
Convenience								32	28
Work schedule								22	20
Home/family schedule								18	27
Length of commute								22	14
Other								6	11
Total								**100**	**100**
Number of respondents								**350**	**176**

Appendix Table C3 (continued)

TRAVEL & TRANSPORTATION - OTHER

(percentage distribution)*

2018	All Students	Undergraduate Students					Graduate Students	Staff	Faculty
		Fresh	Soph	Junior	Senior	All			
On a typical day workday, when do you usually leave for campus?									
Before 6:00 AM								21	2
6:00 - 6:59 AM								36	14
7:00 - 7:59 AM								22	37
8:00 - 8:59 AM								11	31
9:00 - 9:59 AM								1	13
10:00 AM or later								9	3
Other								**	**
Total								**100**	**100**
If you were to use U-M carpooling service, would you be willing to leave home earlier or later than when you leave now?									
Willing to leave home earlier								26	29
Willing to leave home later								15	15
Willing to leave home either earlier or later								26	23
I am not willing to leave home earlier or later								33	33
Total								**100**	**100**
How much earlier would you be willing to leave home?									
Up to 10 minutes earlier								27	15
10-20 minutes earlier								54	45
20-30 minutes earlier								19	40
Total								**100**	**100**
Number of respondents								96	51
How much later would you be willing to leave home?									
Up to 10 minutes later								10	16
10-20 minutes later								55	38
20-30 minutes later								35	46
Total								**100**	**100**
Number of respondents								49	26
How much earlier or later would you be willing to leave home?									
Earlier									
Up to 10 minutes								31	13
10-20 minutes								41	21
20-30 minutes								28	66
Total								**100**	**100**
Number of respondents								87	38

Appendix Table C3 (continued)

TRAVEL & TRANSPORTATION - OTHER

(percentage distribution)*

2018	All Students	Undergraduate Students					Graduate Students	Staff	Faculty
		Fresh	Soph	Junior	Senior	All			
On a typical day workday, when do you usually leave for campus?									
Later									
Up to 10 minutes								21	19
10-20 minutes								43	13
20-30 minutes								36	68
Total								**100**	**100**
Number of respondents								85	38

Appendix Table C3 (continued)

TRAVEL & TRANSPORTATION - OTHER

(percentage distribution)*

2018	All Students	Undergraduate Students					Graduate Students	Staff	Faculty
		Fresh	Soph	Junior	Senior	All			
How much do you agree or disagree with each statement about carpool riders and drivers?									
Would prefer same group of riders each day									
Strongly agree								20	18
Agree								39	34
Neither agree nor disagree								37	45
Disagree								3	2
Strongly disagree								1	1
Total								**100**	**100**
Wouldn't mind changing riders once in a while									
Strongly agree								4	8
Agree								49	51
Neither agree nor disagree								41	34
Disagree								4	6
Strongly disagree								2	1
Total								**100**	**100**
Wouldn't mind changing riders if driver was the same									
Strongly agree								7	5
Agree								31	32
Neither agree nor disagree								53	56
Disagree								6	7
Strongly disagree								3	**
Total								**100**	**100**
Wouldn't mind different drivers if riders were the same									
Strongly agree								3	6
Agree								24	26
Neither agree nor disagree								56	57
Disagree								12	10
Strongly disagree								5	1
Total								**100**	**100**
Wouldn't mind having different drivers and riders									
Strongly agree								3	6
Agree								20	22
Neither agree nor disagree								41	41
Disagree								25	23
Strongly disagree								11	8
Total								**100**	**100**
Number of respondents								349	170

Appendix Table C3 (continued)

TRAVEL & TRANSPORTATION - OTHER

(percentage distribution)*

2018	All Students	Undergraduate Students					Graduate Students	Staff	Faculty
		Fresh	Soph	Junior	Senior	All			
If you don't currently carpool to campus, what are the obstacles to carpooling?									
Takes extra time									
Yes								38	36
No								62	64
Total								**100**	**100**
Difficult to coordinate schedules									
Yes								56	56
No								44	44
Total								**100**	**100**
Lack of privacy/comfort									
Yes								21	14
No								79	86
Total								**100**	**100**
Lack of flexibility/freedom									
Yes								55	50
No								45	50
Total								**100**	**100**
Safety Issues									
Yes								9	3
No								91	97
Total								**100**	**100**
Not knowing who my fellow passengers might be									
Yes								16	10
No								84	90
Total								**100**	**100**
Carpooling doesn't make sense from my home location									
Yes								31	44
No								69	56
Total								**100**	**100**
Other									
Yes								19	23
No								81	77
Total								**100**	**100**
Number of respondents								708	741

*** Question was only asked of staff and faculty who said they most often drove a car to and from home to the work place, used park and ride, or were dropped off and who said they were very likely", "somewhat likely" or "unsure" about participating in an improved U-M carpooling program.

**Less than one-half of one percent.

* Percentage distributions are based on the weighted number of respondents to each question. The actual number of respondents for each question differs since not all questions were answered by all respondents. The minimum number of respondents for each set of questions is shown for faculty and staff.

Appendix Table C4

WASTE PREVENTION & CONSERVATION - AWARENESS

(percentage distribution)*

2018	All Students	Undergraduate Students					Graduate Students	Staff	Faculty
		Fresh	Soph	Junior	Senior	All			
How much do you know about:									
Recycling									
A lot	18	19	16	18	22	18	17	22	24
A fair amount	45	46	46	49	44	47	40	39	44
A little	29	28	32	28	24	29	31	31	27
Not much//nothing	8	7	6	5	10	6	12	8	5
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**
Property Disposition services									
A lot	4	4	2	4	3	3	4	14	9
A fair amount	9	7	8	7	8	8	11	27	28
A little	23	22	24	23	23	23	24	27	33
Not much//nothing	64	67	66	66	66	66	61	32	30
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**
Composting									
A lot	7	11	8	9	5	8	4	7	7
A fair amount	19	27	22	17	17	22	14	11	9
A little	35	39	37	36	34	36	30	25	28
Not much//nothing	39	23	33	38	44	34	52	57	56
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**
The energy consumption of the building where you work									
A lot								4	3
A fair amount								11	11
A little								22	37
Not much//nothing								63	49
Total								**100**	**100**
The energy conservation features of the building where you work									
A lot								5	3
A fair amount								12	14
A little								26	39
Not much//nothing								57	44
Total								**100**	**100**
Number of respondents	3052	1256	737	349	270	2612	438	773	754

*** Percentage distributions are based on the weighted number of respondents to each question. The actual number of respondents for each question differs since not all questions were answered by all respondents. The minimum number of respondents for each group of students and for faculty and staff is shown below.**

Appendix Table C5

WASTE PREVENTION & CONSERVATION - BEHAVIOR

(percentage distribution)*

2018	All Students	Undergraduate Students					Graduate Students	Staff	Faculty
		Fresh	Soph	Junior	Senior	All			
During the past year, how often did you do the following?									
Set the thermostat to 65 degrees or lower during cool or cold weather									
Never	27	27	30	21	31	27	25		
Rarely	22	15	22	29	25	22	22		
Sometimes	19	15	17	23	20	19	21		
Always//Most of the time	17	16	14	17	14	15	22		
Not applicable	15	27	17	10	10	17	10		
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**		
Set thermostat (a/c) to 78 degrees or higher during warm or hot weather									
Never	40	44	44	43	42	43	33		
Rarely	18	14	22	19	16	18	19		
Sometimes	13	8	11	13	14	11	17		
Always//Most of the time	10	4	6	9	11	7	15		
Not applicable	19	30	17	16	17	21	16		
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**		
Turn off lights when I leave the room									
Never	1	0	0	0	0	0	1		
Rarely	2	2	1	0	1	1	2		
Sometimes	8	9	8	8	7	8	10		
Always//Most of the time	88	88	90	91	91	90	86		
Not applicable	1	1	1	1	1	1	1		
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**		
Unplug electrical appliances when not using them									
Never	12	14	9	11	11	12	14		
Rarely	32	35	32	29	32	32	30		
Sometimes	37	35	41	42	37	39	35		
Always//Most of the time	18	15	17	18	19	17	20		
Not applicable	1	1	1	0	1	0	1		
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**		
Use the power saving settings on my computer									
Never	12	12	12	12	14	12	11		
Rarely	18	19	18	16	22	19	18		
Sometimes	36	36	38	39	35	37	32		
Always//Most of the time	33	32	30	32	27	31	38		
Not applicable	1	1	2	1	2	1	1		
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**		

Appendix Table C5 (continued)

WASTE PREVENTION & CONSERVATION - BEHAVIOR

(percentage distribution)*

2018	All Students	Undergraduate Students					Graduate Students	Staff	Faculty
		Fresh	Soph	Junior	Senior	All			
During the past year, how often did you do the following?									
Turn off my computer when not using it									
Never	18	15	20	22	21	19	15		
Rarely	26	23	24	29	31	27	24		
Sometimes	25	27	26	21	24	25	28		
Always//Most of the time	30	34	29	27	23	28	32		
Not applicable	1	1	1	1	1	1	1		
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**		
Use a motion sensor/"smart" power strip									
Never	68	66	67	68	70	68	68		
Rarely	10	10	10	9	12	11	11		
Sometimes	8	7	9	9	5	8	8		
Always//Most of the time	7	8	6	8	8	7	6		
Not applicable	7	9	8	6	5	6	7		
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**		
Print double-sided									
Never	1	1	0	1	1	1	2		
Rarely	3	4	3	3	1	3	3		
Sometimes	12	12	9	11	11	11	13		
Always//Most of the time	84	83	88	85	86	85	82		
Not applicable	0	0	0	0	1	0	**		
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**		
Run washer only when I have a full load of clothes									
Never	1	3	1	1	2	2	1		
Rarely	2	2	1	1	0	1	3		
Sometimes	8	8	9	8	8	9	7		
Always//Most of the time	86	84	86	88	87	85	87		
Not applicable	3	3	3	2	3	3	2		
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**		
Limit time in the shower									
Never	8	10	8	9	8	9	6		
Rarely	21	22	23	21	20	21	20		
Sometimes	44	46	45	42	43	45	43		
Always//Most of the time	26	22	24	28	29	25	30		
Not applicable	1	0	0	0	0	0	1		
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**		

Appendix Table C5 (continued)

WASTE PREVENTION & CONSERVATION - BEHAVIOR

{percentage distribution}*

2018	All Students	Undergraduate Students					Graduate Students	Staff	Faculty
		Fresh	Soph	Junior	Senior	All			
During the past year, how often did you do the following?									
Recycle									
Never	1	1	1	1	2	1	1		
Rarely	5	6	6	5	7	6	5		
Sometimes	28	28	30	29	31	29	24		
Always//Most of the time	65	65	62	65	60	63	70		
Not applicable	1	0	1	0	0	1	0		
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**		
Use a reusable water bottle, coffee mug, etc.									
Never	2	2	2	1	3	2	1		
Rarely	3	4	3	4	3	3	4		
Sometimes	18	15	17	20	20	18	18		
Always//Most of the time	76	78	77	74	73	76	76		
Not applicable	1	1	1	1	1	1	1		
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**		
Recycle electronic waste									
Never	18	21	23	17	18	20	14		
Rarely	19	16	18	26	23	20	16		
Sometimes	15	11	13	18	17	15	15		
Always//Most of the time	19	14	16	16	16	15	29		
Not applicable	29	38	30	23	26	30	26		
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**		
Bring reusable bags to the store									
Never	26	30	29	31	31	30	18		
Rarely	20	15	19	23	22	19	20		
Sometimes	25	19	24	27	25	24	31		
Always//Most of the time	20	12	15	17	17	15	30		
Not applicable	9	24	13	2	5	12	1		
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**		
Shop for things with minimal packaging									
Never	26	31	26	28	30	29	19		
Rarely	30	28	33	29	33	31	28		
Sometimes	32	29	31	32	27	30	40		
Always//Most of the time	7	5	4	8	4	5	10		
Not applicable	5	7	6	3	6	5	3		
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**		

Appendix Table C5 (continued)

WASTE PREVENTION & CONSERVATION - BEHAVIOR

(percentage distribution)*

2018	All Students	Undergraduate Students					Graduate Students	Staff	Faculty
		Fresh	Soph	Junior	Senior	All			
Use U-M Property Disposition Services to obtain items									
Never	73	69	73	77	77	74	71		
Rarely	10	9	9	9	9	9	11		
Sometimes	6	6	5	5	4	5	7		
Always//Most of the time	2	1	2	2	2	1	3		
Not applicable	9	15	11	7	8	11	8		
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**		
Shop in a second-hand store or online site such as eBay when I have to buy something									
Never	28	33	30	25	32	31	22		
Rarely	24	22	25	27	23	24	25		
Sometimes	36	32	33	35	35	33	40		
Always//Most of the time	8	8	8	9	7	8	11		
Not applicable	4	5	4	4	3	4	2		
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**		
Compost food scraps									
Never	42	22	34	45	53	37	54		
Rarely	20	14	20	23	22	19	22		
Sometimes	21	31	30	20	16	25	13		
Always//Most of the time	14	29	12	8	7	16	9		
Not applicable	3	4	4	4	2	3	2		
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**		
Buy products (besides food) that carry some type of eco-label or certification									
Never	23	23	22	24	27	24	20		
Rarely	30	31	33	31	29	31	29		
Sometimes	36	32	34	35	34	33	41		
Always//Most of the time	6	5	5	5	6	6	8		
Not applicable	5	9	6	5	4	6	2		
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**		
During the past year, how often did you do the following <u>at work</u> when you had the opportunity?									
Turn off the lights when I leave the room									
Never								5	1
Rarely								6	2
Sometimes								21	10
Always//Most of the time								60	85
Not applicable								8	2
Total								**100**	**100**

Appendix Table C5 (continued)

WASTE PREVENTION & CONSERVATION - BEHAVIOR

(percentage distribution)*

2018	All Students	Undergraduate Students					Graduate Students	Staff	Faculty
		Fresh	Soph	Junior	Senior	All			
Use the power saving settings on the computer									
Never								13	7
Rarely								8	10
Sometimes								20	20
Always//Most of the time								53	60
Not applicable								6	3
Total								**100**	**100**
Turn off my computer when I leave work									
Never								20	16
Rarely								11	19
Sometimes								12	15
Always//Most of the time								48	42
Not applicable								9	8
Total								**100**	**100**
Use a motion sensor/"smart" power strip									
Never								47	56
Rarely								5	4
Sometimes								6	7
Always//Most of the time								23	22
Not applicable								19	11
Total								**100**	**100**
Print double-sided									
Never								11	4
Rarely								8	7
Sometimes								30	23
Always//Most of the time								45	64
Not applicable								6	2
Total								**100**	**100**
Recycle									
Never								1	1
Rarely								1	**
Sometimes								15	6
Always//Most of the time								81	93
Not applicable								2	0
Total								**100**	**100**

Appendix Table C5 (continued)

WASTE PREVENTION & CONSERVATION - BEHAVIOR

(percentage distribution)*

2018	All Students	Undergraduate Students					Graduate Students	Staff	Faculty
		Fresh	Soph	Junior	Senior	All			
Use a reusable water bottle, coffee cup, travel mug, etc.									
Never								2	2
Rarely								3	4
Sometimes								19	16
Always//Most of the time								74	77
Not applicable								2	1
Total								**100**	**100**
Use U-M Property Disposition Services to obtain items such as computers, furniture, and equipment									
Never								34	36
Rarely								16	21
Sometimes								17	20
Always//Most of the time								13	11
Not applicable								20	12
Total								**100**	**100**
Compost food scraps									
Never								56	56
Rarely								12	13
Sometimes								9	10
Always//Most of the time								9	9
Not applicable								14	12
Total								**100**	**100**
How important is your behavior to conserving energy in the building where you work?									
Very Important								43	38
Somewhat important								44	45
Not that important								10	15
Not at all important								3	2
Total								**100**	**100**

*** Percentage distributions are based on the weighted number of respondents to each question. The actual number of respondents (unweighted) for each question differs since not all questions were answered by all respondents. The minimum number of respondents for each group of students and for faculty and staff is shown below.**

**** Less than one half of one percent.**

Number of respondents	3033	1249	733	343	268	2596	435	775	749

Appendix Table C6

FOOD - AWARENESS

(percentage distribution)*

2018	All Students	Undergraduate Students					Graduate Students	Staff	Faculty
		Fresh	Soph	Junior	Senior	All			
How much do you know about:									
Locally grown or processed food									
A lot	12	12	7	9	12	10	16	20	25
A fair amount	35	36	37	35	32	35	36	35	38
A little	39	38	41	42	41	40	38	35	32
Not much/nothing	14	14	15	14	15	15	10	10	5
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**
Organic food									
A lot	16	15	11	13	19	15	19	20	28
A fair amount	39	38	40	36	35	37	43	42	42
A little	35	36	36	43	34	37	31	30	26
Not much/nothing	10	11	13	8	12	11	7	8	4
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**
Fair trade food									
A lot	8	8	6	6	9	7	11	12	19
A fair amount	25	21	21	27	27	24	28	24	35
A little	38	37	39	39	33	37	38	31	35
Not much/nothing	29	34	34	28	31	32	23	33	11
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**
Food from humanely-treated animals									
A lot	11	11	8	10	12	10	14	14	22
A fair amount	31	33	30	27	32	31	32	28	34
A little	38	37	40	41	37	39	37	37	33
Not much/nothing	20	19	22	22	19	20	17	21	11
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**
Food from animals that were not given hormones or antibiotics									
A lot	13	13	9	12	17	13	15	17	24
A fair amount	34	35	33	31	34	33	35	34	36
A little	36	35	41	38	31	37	35	37	31
Not much/nothing	17	17	17	19	18	17	15	12	9
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**

Appendix Table C6 (continued)

FOOD - AWARENESS

(percentage distribution)*

2018	All Students	Undergraduate Students					Graduate Students	Staff	Faculty
		Fresh	Soph	Junior	Senior	All			
How much do you know about:									
Grass-fed beef									
A lot	12	13	11	11	14	12	13	18	21
A fair amount	30	32	28	30	28	30	30	34	33
A little	36	34	38	33	36	35	36	35	32
Not much/nothing	22	21	23	26	22	23	21	13	14
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**
Fish from sustainable fisheries									
A lot	10	10	8	8	9	9	11	12	19
A fair amount	24	25	20	24	24	23	25	25	33
A little	37	36	40	38	36	38	36	35	34
Not much/nothing	29	29	32	30	31	30	28	28	14
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**

*** Percentage distributions are based on the weighted number of respondents to each question. The actual number of respondents for each question differs since not all questions were answered by all respondents. The minimum number of respondents for each group of students and for faculty and staff is shown below.**

Number of respondents	3037	1250	732	346	270	2600	436	777	752

Appendix Table C7

FOOD - BEHAVIOR

(percentage distribution)*

2018	All Students	Undergraduate Students					Graduate Students	Staff	Faculty
		Fresh	Soph	Junior	Senior	All			
Where do you eat most of your meals (since the beginning of the semester)?									
At home	60	5	47	79	77	48	90		
In campus dining facilities	35	94	50	16	14	48	4		
Elsewhere	5	1	3	5	9	4	6		
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**		
Number of respondents	3054	1257	738	349	271	2615	439		
During the past year, about how often did you (or other household members) buy the following:***									
Locally grown or processed food									
Always/Most of the time	8	16	7	7	7	7	10	17	20
Sometimes	48	33	39	45	47	44	53	64	68
Rarely	22	25	23	21	22	22	21	10	6
Never	4	9	5	5	6	6	3	2	1
Don't Know	17	17	24	20	17	20	12	6	5
I don't eat this	1	**	2	2	1	1	1	1	0
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**
Organic Food									
Always/Most of the time	14	22	15	13	15	15	12	16	28
Sometimes	47	34	39	43	45	43	54	53	52
Rarely	21	20	23	21	20	20	21	20	15
Never	6	15	7	8	6	7	4	6	3
Don't Know	10	9	15	11	11	12	7	3	2
I don't eat this	2	**	1	4	3	3	2	2	0
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**
Fair trade food									
Always/Most of the time	4	9	4	4	5	4	3	6	10
Sometimes	27	27	24	23	27	25	31	31	46
Rarely	22	13	20	19	17	18	27	17	21
Never	10	11	9	7	14	10	9	15	6
Don't Know	35	40	41	45	34	40	28	29	16
I don't eat this	2	**	2	2	3	3	2	2	1
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**
Food from humanely-treated animals									
Always/Most of the time	8	20	9	5	7	7	8	14	23
Sometimes	28	25	23	23	26	24	33	32	37
Rarely	17	19	18	19	14	17	17	11	13
Never	7	10	8	5	8	7	7	10	5
Don't Know	31	22	34	39	35	36	26	28	17
I don't eat this	9	4	8	9	10	9	9	5	5
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**

Appendix Table C7 (continued)

FOOD - BEHAVIOR

(percentage distribution)*

2018	All Students	Undergraduate Students					Graduate Students	Staff	Faculty
		Fresh	Soph	Junior	Senior	All			
During the past year, about how often did you (or other household members) buy the following:***									
Food from animals that were not given hormones or antibiotics									
Always/Most of the time	15	21	14	12	13	13	16	23	31
Sometimes	28	27	21	26	27	25	31	39	37
Rarely	14	17	17	17	11	15	14	11	11
Never	6	5	6	6	8	7	6	6	4
Don't Know	28	23	34	30	31	31	23	17	12
I don't eat this	9	7	8	9	10	9	10	4	5
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**
Grass-fed beef									
Always/Most of the time	8	11	9	7	5	7	8	15	14
Sometimes	20	28	17	20	20	20	21	36	30
Rarely	16	17	14	14	14	14	20	15	18
Never	11	6	13	12	14	13	9	10	7
Don't Know	24	19	26	26	26	26	21	17	12
I don't eat this	21	19	21	21	21	20	21	7	19
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**
Fish from sustainable fisheries									
Always/Most of the time	6	7	4	4	6	5	6	8	17
Sometimes	17	18	14	16	15	15	20	23	33
Rarely	15	17	17	13	11	13	17	12	14
Never	11	13	11	13	17	14	8	13	5
Don't Know	30	24	33	34	30	32	28	28	20
I don't eat this	21	21	21	20	21	21	21	16	11
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**
During the past year, about how much of your grocery purchases were sustainable food?***									
All/most	5	9	4	6	3	5	5	8	11
More than half	14	26	11	9	15	12	17	19	27
Half	17	13	15	17	12	15	20	17	15
Less than half	31	20	31	34	33	32	29	29	23
None	3	**	5	5	4	4	2	1	1
I don't know	30	32	34	29	33	32	27	26	23
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**

Appendix Table C7 (continued)

FOOD - BEHAVIOR

(percentage distribution)*

2018	All Students	Undergraduate Students					Graduate Students	Staff	Faculty
		Fresh	Soph	Junior	Senior	All			
During the past week, how often have you included meat as part of your daily diet?									
Daily/almost daily	53	63	58	47	54	56	45	47	36
3-4 days	21	20	19	24	21	21	22	31	30
1-2 days	13	8	11	15	11	11	18	16	21
Never	13	9	12	14	14	12	15	6	13
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**
During the past year, have you:									
Grown fruits/vegetables in a home garden?									
Yes	19	27	19	17	14	20	18	44	41
No	81	73	81	83	86	80	82	56	59
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**
Grown fruits/vegetables in a community garden?									
Yes	4	6	2	5	5	5	3	7	4
No	96	94	98	95	95	95	97	93	96
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**
Shopped at farmers markets/food stands?									
Yes	57	58	52	60	57	57	60	81	80
No	43	42	48	40	43	43	40	19	20
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**
Belonged to a CSA?									
Yes	3	3	1	4	3	3	5	6	9
No	97	97	99	96	97	97	95	94	91
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**
Visited U-Pick farms?									
Yes	12	13	9	13	10	11	14	31	26
No	88	87	91	87	90	89	86	69	74
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**
Raised animals for food?									
Yes	3	4	3	3	4	3	2	5	2
No	97	96	97	97	96	97	98	95	98
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**

*** Percentage distributions are based on the weighted number of respondents to each question. The actual number of respondents (unweighted) for each question differs since not all questions were answered by all respondents. The minimum number of respondents for each group of students and for faculty and staff is shown below.**

**** Less than one-half of one percent.**

*****Questions were <u>not</u> asked of students who said they ate most of their meals in campus dining facilities resulting in smaller respondent numbers for freshmen and other undergraduate students. The actual number of respondents (unweighted) for each question differs since not all questions were answered by all respondents. The minimum number of respondents for each group of students and for faculty and staff is shown below.**

Number of respondents	1400	72	384	292	233	983	416	773	746

Appendix Table C8

FOOD - OTHER

(percentage distribution)*

2018	All Students	Undergraduate Students					Graduate Students	Staff	Faculty
		Fresh	Soph	Junior	Senior	All			
How important to you are the following when you buy sustainable food?*									
Nutrition									
Very important	57	45	54	52	58	54	59	67	67
Somewhat important	35	43	38	40	37	39	32	30	25
Not that important	6	9	6	7	4	5	7	2	6
Not at all important	2	3	2	1	1	2	2	1	2
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**
Taste									
Very important	63	69	66	61	66	65	60	78	63
Somewhat important	31	28	29	32	27	29	32	20	31
Not that important	5	3	4	6	5	5	6	2	4
Not at all important	1	**	1	1	2	1	2	0	2
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**
Supporting the local community									
Very important	18	16	12	16	13	14	24	51	50
Somewhat important	46	51	42	45	44	44	48	41	41
Not that important	30	26	39	33	36	35	23	7	7
Not at all important	6	7	7	6	7	7	5	1	2
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**
Protecting the environment									
Very important	34	27	29	33	24	29	40	52	60
Somewhat important	48	56	49	46	56	51	44	41	34
Not that important	15	12	17	18	16	17	12	6	5
Not at all important	3	5	5	3	4	3	4	1	1
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**

Appendix Table C8 (continued)

FOOD - OTHER

(percentage distribution)*

2018	All Students	Undergraduate Students					Graduate Students	Staff	Faculty
		Fresh	Soph	Junior	Senior	All			
How important to you are the following when you buy sustainable food?***									
Avoiding synthetic pesticides/fertilizers, antibiotics/growth hormones									
Very important	35	34	31	31	30	31	41	65	62
Somewhat important	36	38	36	34	39	36	36	24	29
Not that important	21	18	26	28	22	25	16	9	8
Not at all important	8	10	7	7	9	8	7	2	1
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**
Affordability									
Very important	70	59	69	78	69	72	68	66	29
Somewhat important	25	31	24	16	25	22	27	30	47
Not that important	4	10	5	5	4	5	4	4	19
Not at all important	1	**	2	1	2	1	1	**	5
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**

*** Percentage distributions are based on the weighted number of respondents to each question. The actual number of respondents (unweighted) for each question differs since not all questions were answered by all respondents. The minimum number of respondents for each group of students and for faculty and staff is shown below.**

**** Less than one-half of one percent.**

***** The questions were not asked of respondents who said "none" or "I don't know" when asked how much of their grocery purchases during the past year was sustainable food. Consequently, the number of respondents to these questions is smaller than the number of respondents to other food questions. The minimum number of respondents for each group of students and for faculty and staff is shown below.**

Number of respondents	1351	69	364	278	226	941	409	559	571

Appendix Table C9

CLIMATE CHANGE

(percentage distribution)*

2018	All Students	Undergraduate Students					Graduate Students	Staff	Faculty
		Fresh	Soph	Junior	Senior	All			
Do you think climate change is happening?									
Yes	95	95	94	93	92	94	96	84	97
No	2	2	2	4	2	2	2	7	1
Don't know	3	3	4	3	6	4	2	9	2
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**
Number of respondents	3051	1258	736	349	271	2613	437	780	758
If yes, how sure are you that climate change is happening?									
Extremely sure	77	76	78	79	76	77	77	63	84
Mostly sure	19	19	16	17	21	18	19	25	13
Somewhat sure	4	5	5	4	2	4	4	10	3
Not at all sure	0	0	1	**	1	1	0	2	0
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**
Number of respondents	2886	1194	689	327	253	2463	423	667	734
If no, how sure are you that climate change is not happening?									
Extremely sure	7	7	8	9	5	6	8	14	10
Mostly sure	16	17	15	26	12	18	8	14	20
Somewhat sure	28	28	25	23	27	27	40	18	25
Not at all sure	49	48	52	42	56	49	44	54	45
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**
Number of respondents	164	64	47	22	18	151	13	110	23
Assuming climate change is happening, do you think it is:									
Caused mostly by human activity	56	56	55	55	51	54	61	39	68
Caused mostly by natural causes	3	2	2	2	4	3	3	6	1
Caused by both	40	42	42	41	45	42	36	52	31
None of the above because climate change is not happening	1	0	1	2	0	1	0	3	0
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**

Appendix Table C9 (continued)

CLIMATE CHANGE

(percentage distribution)*

2018	All Students	Undergraduate Students					Graduate Students	Staff	Faculty
		Fresh	Soph	Junior	Senior	All			
How important is climate change to you personally?									
Not at all important	2	2	2	0	1	1	2	3	1
Not too important	8	8	9	9	8	8	7	8	3
Somewhat important	29	31	31	32	35	32	24	33	17
Very important	37	36	39	37	34	37	38	36	39
Extremely important	24	23	19	22	22	22	29	20	40
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**
How well can you explain climate change to someone?									
Very well	22	21	19	20	25	22	23	9	27
Fairly well	50	50	52	53	46	50	50	42	50
A little bit	26	26	26	25	27	25	25	40	21
Couldn't explain it at all	2	3	3	2	2	3	2	9	2
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**
Number of respondents	3046	1255	736	349	271	2609	437	776	752

*** Percentage distributions are based on the weighted number of respondents to each question. The actual number of respondents for each question differs since not all questions were answered by all respondents. The number of respondents for the last three questions were similar so the minimum number is reported for this group of questions.**

****Less than one-half of one percent.**

Appendix Table C10

SUSTAINABILITY ENGAGEMENT AT U-M & ELSEWHERE

(percentage distribution)*

2018	All Students	Undergraduate Students					Graduate Students	Staff	Faculty
		Fresh	Soph	Junior	Senior	All			
During the *past year* did you participate in any of the following at U-M?									
RecycleMania									
Yes	6	6	7	8	7	7	3	7	4
No	94	94	93	92	93	93	97	93	96
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**
Kill-a-Watt									
Yes	2	1	1	2	1	1	2		
No	98	99	99	98	99	99	98		
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**		
Earthfest									
Yes	11	13	15	16	10	14	5	4	4
No	89	87	85	84	90	86	95	96	96
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**
Zero Waste Events at the Michigan Stadium									
Yes	16	21	24	17	17	20	7	6	8
No	84	79	76	83	83	80	93	94	92
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**
Other Zero Waste Events									
Yes	15	14	17	17	16	16	12	12	8
No	85	86	83	83	84	84	88	88	92
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**
Planet Blue Ambassadors Program									
Yes	5	5	7	8	6	6	3	10	5
No	95	95	93	92	94	94	97	90	95
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**
Sustainable Workplace Certification Program									
Yes								6	4
No								94	96
Total								**100**	**100**
Sustainable Lab Recognition Program									
Yes								5	6
No								95	94
Total								**100**	**100**

Appendix Table C10 (continued)

SUSTAINABILITY ENGAGEMENT AT U-M & ELSEWHERE

(percentage distribution)*

2018	All Students	Undergraduate Students					Graduate Students	Staff	Faculty
		Fresh	Soph	Junior	Senior	All			
During the *past year* did you participate in any of the following at U-M?									
M Farmers Market									
Yes	19	17	19	25	21	20	17	34	21
No	81	83	81	75	79	80	83	66	79
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**
A U-M organization dealing with sustainability									
Yes	14	12	17	16	17	15	11	9	13
No	86	88	83	84	83	85	89	91	87
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**
A U-M course that addressed sustainability									
Yes	17	16	22	19	19	19	13		
No	83	84	78	81	81	81	87		
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**		
Visited the Planet Blue website									
Yes	24	29	26	27	17	25	21	23	21
No	76	71	74	73	83	75	79	77	79
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**
Read about U-M sustainability efforts in Michigan Daily or other media outlets									
Yes	32	32	39	31	29	33	30	41	46
No	68	68	61	69	71	67	70	59	54
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**
Other									
Yes	7	8	7	6	6	7	8	8	9
No	93	92	93	94	94	93	92	92	91
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**

Appendix Table C10 (continued)

SUSTAINABILITY ENGAGEMENT AT U-M & ELSEWHERE

(percentage distribution)*

2018	All Students	Undergraduate Students					Graduate Students	Staff	Faculty
		Fresh	Soph	Junior	Senior	All			
During the past year, have you done any of the following to promote environmental protection, energy/water conservation, etc.?									
Given money to an organization or advocacy group supporting one of the above issues?									
Yes	21	19	19	21	18	19	24	31	55
No	79	81	81	79	82	81	76	69	45
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**
Volunteered for an organization or advocacy group supporting one of the above issues?									
Yes	26	30	28	28	25	28	19	11	10
No	74	70	72	72	75	72	81	89	90
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**
Served in a leadership position for an organization or advocacy group supporting one of the above issues?									
Yes	8	8	8	10	9	9	6	4	3
No	92	92	92	90	91	91	94	96	97
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**
Voted for a candidate for public office because of her/his position on any of the above issues?									
Yes	43	26	47	43	51	41	49	50	69
No	57	74	53	57	49	59	51	50	31
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**
During fall semester, how many U-M football games did you attend at Michigan Stadium?									
None	39	21	32	34	34	29	63	82	76
1-2 games	18	20	15	15	14	16	21	12	16
3-4 games	16	22	21	16	14	19	8	2	3
5-6 games	27	37	32	35	38	36	8	4	5
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**

*** Percentage distributions are based on the weighted number of respondents to each question. The actual number of respondents for each question differs since not all questions were answered by all respondents. The minimum number of respondents for each group of students and for faculty and staff is shown below.**

Number of respondents	2734	1129	642	312	244	2327	406	572	539

Appendix Table C11

U-M SUSTAINABILITY INITIATIVES - AWARENESS & RATINGS

(percentage distribution)*

2018	All Students	Undergraduate Students					Graduate Students	Staff	Faculty
		Fresh	Soph	Junior	Senior	All			
How aware are you of U-M's efforts to:									
Conserve Energy									
Very aware	19	20	20	17	20	20	17	23	20
Somewhat aware	50	53	54	54	52	53	44	47	53
Not too aware	22	21	18	21	20	20	28	22	20
Not at all aware	9	6	8	8	8	7	11	8	7
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**
Encourage people to take a bus or bike									
Very aware	22	26	21	20	22	23	19	27	19
Somewhat aware	42	43	45	46	43	44	38	44	46
Not too aware	26	23	26	26	27	25	28	22	26
Not at all aware	10	8	8	8	8	8	15	7	9
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**
Promote ride sharing									
Very aware	13	17	11	14	12	14	10	27	14
Somewhat aware	33	34	33	32	34	33	32	43	40
Not too aware	36	33	38	37	38	36	34	22	31
Not at all aware	18	16	18	17	16	17	24	8	15
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**
Promote recycling									
Very aware	42	52	49	41	43	47	29	41	39
Somewhat aware	39	35	37	39	39	37	43	41	43
Not too aware	13	9	10	15	12	11	18	13	13
Not at all aware	6	4	4	5	6	5	10	5	5
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**
Promote food from sustainable sources									
Very aware	21	32	26	22	20	26	8	12	7
Somewhat aware	35	39	37	40	35	38	30	35	27
Not too aware	28	20	26	26	26	25	36	37	42
Not at all aware	16	9	11	12	19	11	26	16	24
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**
Reduce greenhouse gas emissions									
Very aware	13	15	14	14	11	14	11	11	10
Somewhat aware	33	35	33	35	38	35	29	30	34
Not too aware	35	35	37	35	35	35	34	39	36
Not at all aware	19	15	16	16	16	16	26	20	20
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**

Appendix Table C11 (continued)

U-M SUSTAINABILITY INITIATIVES - AWARENESS & RATINGS

(percentage distribution)*

2018	All Students	Undergraduate Students					Graduate Students	Staff	Faculty
		Fresh	Soph	Junior	Senior	All			
How aware are you of U-M's efforts to:									
Maintain campus grounds in an environmentally-friendly manner									
Very aware	16	20	17	19	14	17	12	16	11
Somewhat aware	34	40	36	32	35	37	30	37	36
Not too aware	31	27	30	33	32	30	32	31	33
Not at all aware	19	13	17	16	19	16	26	16	20
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**
Protect the Huron River									
Very aware	8	8	6	10	8	8	7	11	6
Somewhat aware	19	21	21	18	22	21	17	23	24
Not too aware	37	33	38	41	36	37	38	37	38
Not at all aware	36	38	35	31	34	34	38	29	32
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**
Promote Composting									
Very aware	24	44	31	22	15	30	11	13	6
Somewhat aware	32	32	34	34	36	33	28	21	22
Not too aware	26	15	24	28	28	23	33	34	34
Not at all aware	18	9	11	16	21	14	28	32	38
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**
Promote Zero Waste Events at Michigan Stadium									
Very aware	18	22	21	20	20	21	11	17	9
Somewhat aware	27	28	30	28	26	28	23	22	23
Not too aware	27	27	26	28	29	27	28	29	27
Not at all aware	28	23	23	24	25	24	38	32	41
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**
Promote Other Zero Waste Events									
Very aware	15	19	18	14	15	17	11	12	4
Somewhat aware	27	29	29	26	27	28	25	24	20
Not too aware	30	29	30	34	31	31	28	32	33
Not at all aware	28	23	23	26	27	24	36	32	43
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**
Promote the Sustainability Living Experience (SLE)									
Very aware	9	12	9	10	8	10	6		
Somewhat aware	20	25	26	18	24	23	15		
Not too aware	32	32	33	33	31	33	29		
Not at all aware	39	31	32	39	37	34	50		
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**		

*** Percentage distributions are based on the weighted number of respondents to each question. The actual number of respondents for each question differs since not all questions were answered by all respondents. The minimum number of respondents for each group of students and for faculty and staff is shown below.**

Number of respondents	3023	1246	727	343	268	2588	434	771	749

Appendix Table C11 (continued)

U-M SUSTAINABILITY INITIATIVES - AWARENESS & RATINGS

(percentage distribution)*

2018	All Students	Undergraduate Students					Graduate Students	Staff	Faculty
		Fresh	Soph	Junior	Senior	All			
*How would you rate U-M's efforts to:***									
Conserve energy									
(5) Very good (A)	17	20	17	17	17	18	15	17	17
(4) Good (B)	46	50	47	46	47	48	44	49	49
(3) Fair (C)	31	25	31	31	30	29	34	29	28
(2) Poor (D)	5	5	5	5	6	4	6	4	5
(1) Very poor (F)	1	0	0	1	0	1	1	1	1
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**
Mean Rating	3.73	3.85	3.76	3.73	3.75	3.78	3.66	3.77	3.76
Encourage people to take bus/bike									
(5) Very good (A)	22	29	23	21	21	24	17	24	14
(4) Good (B)	41	36	40	40	44	40	44	42	43
(3) Fair (C)	28	26	28	29	26	27	32	28	33
(2) Poor (D)	8	8	8	8	7	8	7	6	9
(1) Very poor (F)	1	1	1	2	2	1	0	0	1
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**
Mean Rating	3.75	3.84	3.76	3.70	3.75	3.78	3.71	3.84	3.6
Promote ride sharing									
(5) Very good (A)	11	15	12	10	9	12	10	22	10
(4) Good (B)	31	29	31	32	32	31	30	38	37
(3) Fair (C)	38	36	36	37	35	36	43	32	39
(2) Poor (D)	18	18	19	20	20	19	15	7	12
(1) Very poor (F)	2	2	2	1	4	2	2	1	2
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**
Mean Rating	3.31	3.37	3.32	3.30	3.22	3.32	3.31	3.73	3.41
Promote recycling									
(5) Very good (A)	35	45	37	36	37	39	26	31	28
(4) Good (B)	40	38	42	35	43	40	45	40	45
(3) Fair (C)	19	14	17	20	15	16	23	23	21
(2) Poor (D)	5	3	3	8	4	4	5	5	5
(1) Very poor (F)	1	0	1	1	1	1	1	1	1
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**
Mean Rating	4.03	4.25	4.11	3.97	4.11	4.12	3.90	3.95	3.94
Promote food from sustainable sources									
(5) Very good (A)	18	29	24	15	15	22	9	11	6
(4) Good (B)	34	36	35	34	36	35	29	35	31
(3) Fair (C)	35	27	32	37	35	32	43	42	48
(2) Poor (D)	11	7	7	12	13	9	17	10	14
(1) Very poor (F)	2	1	2	2	1	2	2	2	1
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**
Mean Rating	3.55	3.85	3.72	3.48	3.51	3.66	3.26	3.43	3.27

Appendix Table C11 (continued)

U-M SUSTAINABILITY INITIATIVES - AWARENESS & RATINGS

(percentage distribution)*

2018	All Students	Undergraduate Students					Graduate Students	Staff	Faculty
		Fresh	Soph	Junior	Senior	All			
*How would you rate U-M's efforts to:***									
Reduce greenhouse gas emissions									
(5) Very good (A)	11	14	13	8	12	12	9	10	8
(4) Good (B)	35	36	35	32	31	34	40	36	40
(3) Fair (C)	40	38	40	47	38	40	39	41	42
(2) Poor (D)	12	11	11	12	17	12	10	12	8
(1) Very poor (F)	2	1	1	1	2	2	2	1	2
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**
Mean Rating	3.41	3.51	3.48	3.34	3.34	3.42	3.42	3.44	3.42
Maintain campus grounds in an environmentally friendly manner									
(5) Very good (A)	19	26	20	17	15	20	15	18	16
(4) Good (B)	39	39	42	34	41	39	40	43	43
(3) Fair (C)	35	30	31	40	39	34	38	32	34
(2) Poor (D)	6	4	6	8	4	6	6	6	6
(1) Very poor (F)	1	1	1	1	1	1	1	1	1
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**
Mean Rating	3.69	3.85	3.74	3.58	3.65	3.71	3.62	3.71	3.67
Protect the Huron River									
(5) Very good (A)	12	15	12	11	11	12	10	14	8
(4) Good (B)	32	36	31	30	29	32	33	35	40
(3) Fair (C)	44	36	45	44	47	43	47	42	44
(2) Poor (D)	11	11	10	12	11	11	9	8	7
(1) Very poor (F)	1	2	2	3	2	2	1	1	1
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**
Mean Rating	3.43	3.51	3.41	3.34	3.36	3.41	3.42	3.53	3.47
Promote Composting									
(5) Very good (A)	25	43	27	20	18	29	14	18	10
(4) Good (B)	33	32	36	33	30	33	30	30	32
(3) Fair (C)	29	18	26	30	35	26	37	39	42
(2) Poor (D)	11	6	10	14	13	10	15	11	14
(1) Very poor (F)	2	1	1	3	4	2	4	2	2
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**
Mean Rating	3.68	4.10	3.78	3.53	3.45	3.77	3.35	3.51	3.34
Promote Zero Waste Events									
(5) Very good (A)	20	26	22	17	16	21	17	19	12
(4) Good (B)	34	36	32	31	34	33	36	34	39
(3) Fair (C)	33	27	36	36	37	33	34	38	39
(2) Poor (D)	11	10	9	13	11	11	11	8	9
(1) Very poor (F)	2	1	1	3	2	2	2	1	1
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**

Mean Rating	3.59	3.76	3.65	3.46	3.51	3.60	3.55	3.62	3.52

*** Percentage distributions are based on the weighted number of respondents to each question. The actual number of respondents for each question differs since not all questions were answered by all respondents. The minimum number of respondents for each group of students and for faculty and staff is shown below.**

**** Questions were not asked of respondents who said they were "not at all aware" of each corresponding U-M initiative. Consequently, the number of respondents rating each initiative is smaller than those reporting their level of awareness. The actual number of respondents for each question differs since not all questions were answered by all respondents. The minimum number of respondents for each group of students and for faculty and staff is shown below.**

Number of respondents	1903	773	455	234	178	1640	262	515	438

Appendix Table C12

OTHER BEHAVIORS & OPINIONS ABOUT SUSTAINABILITY

(percentage distribution)*

2018	All Students	Undergraduate Students					Graduate Students	Staff	Faculty
		Fresh	Soph	Junior	Senior	All			
Overall, how committed are you to sustainability?									
Very committed	18	18	15	16	16	16	23	19	39
Somewhat committed	59	59	58	58	60	58	58	62	53
Not very committed	21	21	24	23	22	23	16	17	7
Not at all committed	2	2	3	3	2	3	3	2	1
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**
Who or what has been most influential in shaping your views about sustainability?									
Friends or classmates	20	15	19	20	20	18	24	12	9
Parents or other family members	14	18	15	15	16	16	9	14	10
K-12 teachers	8	14	10	8	8	10	4	2	2
U-M professors/instructors	13	9	14	18	19	14	8	2	1
Childhood experience outdoors	7	7	7	6	6	7	9	11	7
Media--readings, video, movies, TV	32	33	31	29	26	30	37	45	55
Other UM activities	1	1	0	0	2	1	1	2	2
Other	5	3	4	4	3	4	8	12	14
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**

*** Percentage distributions are based on the weighted number of respondents to each question. The actual number of respondents for each question differs since not all questions were answered by all respondents. The minimum number of respondents for each group of students and for faculty and staff is shown below.**

Number of respondents	3032	1250	732	347	268	2597	433	761	745

Appendix Table C13

Sustainability Literacy - Knowledge

(percentage distribution)*

2018	All Students	Undergraduate Students					Graduate Students	Staff	Faculty
		Fresh	Soph	Junior	Senior	All			
ENVIRONMENT									
What is the most common cause of pollution in streams & rivers?									
Dumping of garbage by cities	12	14	13	11	14	13	11		
Surface water running off yards, city streets, paved lots, & farm fields* **	43	39	44	45	42	42	46		
Litter near streams and rivers	4	6	5	4	4	5	3		
Waste dumped by factories	18	19	15	18	16	17	19		
Don't know	23	22	23	22	24	23	21		
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**		
Ozone forms a protective layer in the earth's upper atmosphere. What does ozone protect us from?									
Acid rain	1	2	1	0	2	1	1		
Climate change	2	1	1	2	3	2	2		
Sudden changes in temperature	2	3	2	3	2	2	2		
Harmful UV rays* **	91	89	91	91	90	91	93		
Don't know	4	5	5	4	3	4	2		
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**		
Which of the following is an example of sustainable forest management?									
Setting aside forests to be off limits to public	10	14	10	8	11	11	6		
Never harvesting more than what the forest produces in new growth* **	73	67	71	73	72	71	78		
Producing lumber for nearby communities to build affordable housing	2	2	2	1	2	2	2		
Putting the local communities in charge of forest resources	2	2	2	3	2	2	3		
Don't know	13	15	15	15	13	14	11		
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**		
Of the following, which would be considered living in the most									
Recycling all recyclable packaging	27	27	29	27	31	28	25		
Reducing consumption of all products* **	52	47	50	51	49	49	58		
Buying products labeled "eco" or "green"	11	15	11	10	9	11	8		
Buying the newest products available	0	1	0	**	1	1	**		
Don't know	10	10	10	12	10	11	9		
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**		

Appendix Table C13 (continued)

Sustainability Literacy - Knowledge

(percentage distribution)*

2018	All Students	Undergraduate Students					Graduate Students	Staff	Faculty
		Fresh	Soph	Junior	Senior	All			
SOCIAL									
Which of the following is the most common definition of sustainable development?									
Create government welfare system to ensure universal access to education, healthcare, social services	3	5	4	3	1	4	3		
Setting aside resources for preservation, never to be used	3	4	3	1	3	3	1		
Meeting the needs of present without compromising the ability of future generations to meet their own needs* **	75	68	69	72	77	71	83		
Building a neighborhood that is both socio-demographically and economically diverse	2	2	3	3	4	2	2		
Don't know	17	21	21	21	15	20	11		
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**		
Over past 3 decades, what happened to difference between wealth of richest and poorest Americans?									
The difference has increased* **	86	81	85	84	87	84	91		
The difference stayed about the same	3	5	4	7	4	5	1		
The difference has decreased	2	3	2	1	1	2	1		
Don't know	9	11	9	8	8	9	7		
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**		
ECONOMIC									
Many economists argue that electricity prices in the U.S. are too low because?									
They do not reflect the costs of pollution from generating electricity* **	58	51	55	54	61	55	64		
Too many suppliers go out of business	2	3	1	2	2	2	1		
Electric companies have a monopoly in their service area	11	12	12	14	15	13	8		
Consumers spend only a small part of their income on energy	2	2	2	3	2	2	2		
Don't know	27	32	30	27	20	28	25		
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**		
Which of the following is the most common definition of economic sustainability?									
Maximizing the share price of a company's stock	1	2	2	2	2	2	0		
Long term profitability* **	45	43	44	46	44	44	48		
When costs equal revenue	17	17	16	15	17	16	17		
Continually expanding market share	5	4	4	5	8	5	5		
Don't know	32	34	34	32	29	33	30		
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**		

Appendix Table C13 (continued)

Sustainability Literacy - Knowledge

(percentage distribution)*

2018	All Students	Undergraduate Students					Graduate Students	Staff	Faculty
		Fresh	Soph	Junior	Senior	All			
ECONOMIC/ENVIRONMENTAL									
Which of the following countries passed the U.S. to become the largest emitter of greenhouse gas carbon dioxide?									
China* **	82	79	84	83	83	81	85		
Sweden	1	1	1	**	**	1	1		
Brazil	2	2	3	3	4	3	1		
Japan	2	2	1	2	1	2	1		
Don't know	13	16	11	12	12	13	12		
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**		
Which of the following is a leading cause of the depletion of fish stocks in the Atlantic Ocean?									
Fisherman seeking to maximize their catch* **	28	28	28	27	32	29	27		
Reduced fish fertility due to genetic hybridization	3	2	3	3	3	3	2		
Ocean pollution	24	27	27	30	21	27	18		
Global climate change	18	16	14	16	16	15	24		
Don't know	27	27	28	24	28	26	29		
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**		
SOCIAL/ECONOMIC									
Which of the following is the best example of environmental justice?									
Urban citizens win a bill to have toxic waste taken to rural communities	5	6	6	4	4	5	4		
The government dams a river, flooding Native American tribal lands to create hydro-power for large cities	2	3	3	4	1	3	1		
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* **	66	59	61	64	64	62	76		
Multi-national corporations build factories in developing countries where environmental laws are less strict	2	1	2	2	3	2	1		
Don't know	25	31	28	26	28	28	18		
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**		

Appendix Table C13 (continued)

Sustainability Literacy - Knowledge

(percentage distribution)*

2018	All Students	Undergraduate Students					Graduate Students	Staff	Faculty
		Fresh	Soph	Junior	Senior	All			
ENVIRONMENT/SOCIAL									
Put the following list in order of the activities with the largest									
A. Keeping a cell phone charger plugged into an electrical outlet for 12 hours									
B. Producing one McDonald's quarter-pound hamburger									
C. Producing one McDonald's chicken sandwich									
D. Flying in a commercial airplane from Washington D.C. to China									
A,C,B,D	4	5	5	5	5	5	3		
D,A,B,C	19	23	18	20	21	21	16		
D,C,B,A	8	8	11	11	7	9	5		
D,B,C,A* **	51	43	45	46	52	46	61		
Don't know	18	21	21	18	15	19	15		
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**		
SUSTAINABILITY and DEI OPINION									
Agree or disagree with statement: Sustainability and DEI are related?									
Strongly agree	23	18	16	22	20	18	33		
Somewhat agree	37	37	41	38	38	39	35		
Neither agree nor disagree	23	29	27	20	25	25	19		
Somewhat disagree	11	11	10	15	11	12	9		
Strongly disagree	6	5	6	5	6	6	4		
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**		

*** Percentage distributions are based on the weighted number of respondents to each question. The actual number of respondents for each question differs since not all questions were answered by all respondents. The minimum number of respondents for each group of students and for faculty and staff is shown below.**

**** Less than one half of one percent.**

***** Items in bold indicate the correct answer to the question.**

Number of respondents	2932	1212	701	336	260	2510	420	-	-

Appendix D: Constructing Indicators

During the initial year of SCIP (2012), indicators or indices were created that combined responses to closely related questions about a common idea, concept, or action. In many instances, responses were statistically correlated. Weakly correlated responses that reflect different dimensions of the same idea, concept, or action were nevertheless combined to create a desired indicator.[64] Items used to create indices are shown in Table D1. In order to summarize findings covering key concepts reflecting the culture of sustainability, several indicators were created. The procedure consisted of two steps. First, conceptually related items were identified and, for each respondent, the coded or numeric values of the responses to each were combined or added together.

For most of the indices, the number of response categories to their respective questions was identical.[65] Numerical values were assigned to responses such that higher values represented the most sustainable forms of behavior or the highest levels of awareness, while the lower values represented the least sustainable behaviors or lowest levels of awareness. For example, for responses to the question, "During the past year, how often did you turn off lights when leaving the room", "always/most of the time" was coded 4, "sometimes" was coded 3, "rarely" was coded 2, and "never" was coded 1. Together with 3 other questions, the maximum summary score for any respondent would be 16 and the minimum score would be 4. The distribution of summary scores for all student and staff/faculty respondents was then tabulated.

Respondents who said "don't know" or "not applicable" to questions used in developing selected indicators were not included when building those indicators. That is, index scores were not calculated for these respondents. On occasion, some of the remaining respondents skipped one of the questions comprising the index. Rather than eliminating these respondents from the analysis and thus reducing the sample size, the modal value of all other respondents to the question was assigned to the non-response item. These respondents were then retained in the sample. The operational rule for dealing with missing values was as follows. For indicators consisting of one or two items, participants with one or two non-responses were excluded from the analysis. For indicators consisting of three items, respondents with one non-response were assigned the modal value to that item. For indicators using four or more than four items, participants who had more than 2 non-responses were eliminated from the analysis. Those with one or two non-response items were assigned the modal value of all responses to those items.

The second step involved the creation of a common metric or scale for all indicators. This was necessary since the range of scores for each indicator varied. Some varied from one to four while others varied from eight to thirty-two. In order to make the indicators comparable and easier to understand, all the indicators were converted to common metric or a 0 to 10 scale. For instance, the summed Waste Prevention Behavior Index for participants ranged from 4 to 16. In this case, the minimum value (4) was subtracted from the maximum value (16) resulting in a scale ranging from 0 to 12. Each value was then divided by

[64] Exploratory factor analysis with a Cronbach Alpha was employed to assess associations and the internal consistency in a set of responses. The alphas for the indices used in the 2012 SCIP survey vary from .32 to .94. The alphas are shown in Table D1 in the 2012 SCIP report.

[65] The exception was Sustainability Food Purchase Index, where one question had five response options while the other two questions had four. These three variables could not be added up immediately. These three variables were first normalized and after normalizing, were added together.

the new maximum value (12), so that the new index score would be between 0 to 1.That score was then multiplied by 10, resulting in a value ranging from 0 to 10. SPSS Complex Samples was then used to determine the distributions and the mean scores of indicators.[66] Based on changes made to the questionnaires, several items were dropped in 2018.

[66] SPSS Complex Samples gives more accurate statistical estimates than Base SPSS.

Appendix Table D1

SUSTAINABILITY CULTURAL INDICATORS CONSTRUCTION

(names of and number of items)

	Students		Staff/Faculty	
Name of Index	**Name of Items**	**No. of items**	**Name of Items**	**No. of items**
PRIMARY				
Climate Action				
Conservation Behavior	turn off lights, use computer power-saver, turn off computer, use motion sensor	4	turn off lights, use computer power-saver, turn off computer, use motion sensor (at work)	4
Travel Behavior	Most often mode of travel to campus since fall sem	1	Most often mode of travel to work	1
Waste Prevention				
Waste Prevention Behavior	print dble-sided, recycle paper, etc., use reusable cups, etc., use property disposition	4	print dble-sided, recycle paper, etc., use reusable cups, etc., use property disposition	4
Healthy Environments				
Sustainable Food Purchases	Buy sustainable food, organic, locally-grown	3	Buy sustainable food, organic, locally-grown	3
Protecting the Natural Environment	use fertilizer, herbicides, water lawn	3	use fertilizer, herbicides, water lawn	3
Community Awareness				
Sustainable Travel & Transportation	AAATA, UM buses, biking, Zipcar rental	4	AAATA, UM buses, biking, Zipcar rental	4
Waste Prevention	recycle glass, plastic, paper, electrical waste, property disposition	5	recycle glass, plastic, paper, electrical waste, property disposition	5
Natural Environment Protection	dispose hazardous waste, recognize invasive species, residential property, protect Huron River	4	dispose hazardous waste, recognize invasive species, residential property, protect Huron River	4
Sustainable Foods	locally grown, organic, fair trade, humanely-treated, hormones-free, grassfed, sustainable fish	7	locally grown, organic, fair trade, humanely-treated, hormones-free, grassfed, sustainable fish	7
U-M Sustainability Initiatives	save energy, encourage bus or bike, promote ride sharing, recycling, sust food, reduce greenhouse gas, maintain grounds, protect Huron River	8	save energy, encourage bus or bike, promote ride sharing, recycling, sust food, reduce greenhouse gas, maintain grounds, protect Huron River	8
SECONDARY				
Sustainability Engagement at U-M (1)	partic in sustain. org., Earthfest, sustain class	3	partic in org., Earthfest	2
Sustainability Engagement at U-M (2)	partic in sustain. org., Earthfest, sustain class, Planet Blue Ambassadors program	4	partic in org., Earthfest, Planet Blue Ambassadors program	3
Sustainability Engagement Generally	give money, voting, volunteering, serving as officer	4	give money, voting, volunteering, serving as officer	4
Sustainability Commitment	how committed to sustainability	1	how committed to sustainability	1
Sustainability Disposition	willingness to pay items	3	willingness to pay items	3
Rating U-M Sustainability Initiatives	save energy, encourage bus or bike, promote ride sharing, recycling, sust food, reduce greenhouse gas, maintain grounds, protect Huron River	8	save energy, encourage bus or bike, promote ride sharing, recycling, sust food, reduce greenhouse gas, maintain grounds, protect Huron River	8
Items discontinued due to changes in questionnaires				

Appendix E: Supplemental Tables - 2018

The following tables present detailed information covering 2012-2018 indicator scores for students, staff, and faculty, 2018 sub-region differences in indicator scores for the larger operational regions of the Ann Arbor campus compared to 2015 and 2018 results, student panel sustainability indices for 2012-2018, and results from a new set of questions on sustainability literacy.

Appendix Table E1a

CHANGE IN SUSTAINABILITY CULTURAL INDICATORS for STUDENTS between 2012 & 2018*

(mean scores)

INDICES	Students				
	2012	2013	2014	2015	2018
PRIMARY					
Climate Action					
Conservation Behavior	6.1	6.2	6.1	6.1	5.8⬇▼
Travel Behavior	7.6	7.5	7.4	7.6	7.5
Waste Prevention					
Waste Prevention Behavior	6.6	6.6	6.7	6.9	7.0⬆
Healthy Environments					
Sustainable Food Purchases	5.5	5.3	5.6	5.5	5.3
Protecting the Natural Environment	8.6	8.9	8.8	8.8	+
Community Awareness					
Sustainable Travel & Transportation	4.4	4.3	4.2	4.1	4.1⬇
Waste Prevention	4.0	4.2	4.2	4.1	+
Natural Environment Protection	3.1	3.3	3.4	3.4	+
Sustainable Foods	4.3	4.5	4.8	4.7	4.5 ▼
U-M Sustainability Initiatives	5.1	5.1	5.0	5.1	5.2 ▲
SECONDARY					
Sustainability Engagement at U-M-1**	1.3	1.4	1.6	1.9	+
Sustainability Engagement at U-M-2***				1.7	1.2 ▼
Sustainability Engagement Generally	1.9	1.8	2.0	2.0	2.4⬆▲
Sustainability Disposition	3.5	3.3	3.4	3.4	+
Sustainability Commitment	6.3	6.3	6.3	6.5	6.4
Rating U-M Sustainability Initiatives	6.6	6.4	6.5	6.7	6.6

* 2012-2015 figures are based the fall surveys while the 2018 figures are based on the winter survey

** Indicator based on responses to 3 questions for students and 2 questions for staff & faculty. Questions begin with "*Have you ever participated in…."*

** Indicator based on responses to 4 questions for students and 3 questions for staff & faculty. Questions begin with "*During the past, year, have you participated in……..?* "

+ Questionnaire changes made in 2018 do not allow for indicator comparisons with previous years.

⬆ significant change from 2012 (p<.001)

⬆ significant change from 2012 (p<.01)

⬆ significant change from 2012 (p<.05)

▲ significant change from previous year (p<.001)

▲ significant change from previous year (p<.01)

▲ significant change from previous year (p<.05)

Appendix Table E1b

CHANGE IN SUSTAINABILITY CULTURAL INDICATORS for STAFF & FACULTY between 2012 & 2018*

(mean scores)

INDICES	Staff					Faculty				
	2012	2013	2014	2015	2018	2012	2013	2014	2015	2018
PRIMARY										
Climate Action										
Conservation Behavior	6.6	6.7	6.5	6.5	6.4	6.9	6.9	7.0	7.0	6.7 ▼
Travel Behavior	1.6	1.4	1.6	1.5	1.1⇓▽	2.2	2.0	1.8	2.3	2.0
Waste Prevention										
Waste Prevention Behavior	7.0	7.0	7.1	7.1	7.2⇧	7.3	7.3	7.4	7.6	7.6⇧
Healthy Environments										
Sustainable Food Purchases	5.7	5.8	5.8	5.9	5.9⇧	6.3	6.2	6.3	6.4	6.7⇧▲
Protecting the Natural Environment	6.5	6.4	6.6	6.7	+	6.1	6.1	6.4	6.6	+
Community Awareness										
Sustainable Travel & Transportation	3.0	3.0	3.1	3.1	2.9 ▽	3.4	3.3	3.3	3.5	3.4
Waste Prevention	5.0	5.1	5.0	4.9	+	5.1	5.4	5.5	5.3	+
Natural Environment Protection	4.1	4.3	4.3	4.2	+	4.3	4.6	4.6	4.5	+
Sustainable Foods	4.7	5.1	5.0	5.2	4.9 ▽	5.6	5.7	5.7	6.0	5.7 ▽
U-M Sustainability Initiatives	5.4	5.6	5.3	5.3	5.5	4.9	5.1	5.0	5.1	5.2⇧
SECONDARY										
Sustainability Engagement at U-M-1**	0.9	0.7	0.7	1.1	+	0.7	0.7	0.7	1.2	+
Sustainability Engagement at U-M-2***				1.3	0.8 ▼				1.2	0.7 ▼
Sustainability Engagement Generally	1.9	1.9	1.8	1.8	2.4⇧▲	3.0	2.9	3.0	2.7	3.4⇧▲
Sustainability Disposition	2.6	2.6	2.5	2.5	+	5.3	4.7	4.9	4.8	+
Sustainability Commitment	6.3	6.4	6.4	6.4	6.6⇧	7.0	7.2	7.1	7.2	7.7⇧▲
Rating U-M Sustainability Initiatives	6.7	6.8	6.6	6.7	6.7	6.4	6.5	6.4	6.5	6.6

* 2012-2015 figures are based the fall surveys while the 2018 figures are based on the winter survey

** Indicator based on responses to 3 questions for students and 2 questions for staff & faculty. Questions begin with "*Have you ever participated in…."*

** Indicator based on responses to 4 questions for students and 3 questions for staff & faculty. Questions begin with "*During the past, year, have you participated in……..?* "

+ Questionnaire changes made in 2018 do not allow for indicator comparisons with previous years.

⇧ significant change from 2012 (p<.001)

⇧ significant change from 2012 (p<.01)

⇧ significant change from 2012 (p<.05)

▲ significant change from previous year (p<.001)

▲ significant change from previous year (p<.01)

▲ significant change from previous year (p<.05)

Appendix E2

STUDENT PANEL SUSTAINABILITY INDICES - 2014-2018

(mean scores)

INDICES	Undergraduate Panel Fr 2014	Undergraduate Panel Sr 2018
PRIMARY		
Climate Action		
Conservation Behavior	5.9	5.7
Travel Behavior	7.8	8.1
Waste Prevention		
Waste Prevention Behavior	6.6	7.1 ⬆
Health Environments		
Sustainable Food Purchases[a]	5.9	5.0
Community Awareness		
Sustainable Travel & Transportation	3.4	4.4 ⬆
Sustainable Foods	4.2	4.5 ⬆
U-M Sustainability Initiatives	5.8	5.7
SECONDARY		
Sustainability Engagement at U-M-2	-	2.0
Sustainability Engagement Generally	2.1	3.0 ⬆
Sustainability Commitment	5.9	6.7 ⬆
Rating U-M Sustainability Initiatives	7.0	6.2 ⬇
number of respondents[a]	435	

[a] Most U-M freshmen live in residence halls and therefore were not asked questions about purchasing sustainable foods. Only 21 of the 2014 freshmen selected to participate in the panel answered questions about sustainable food purchases. Therefore statistical analyses to examine the significance of change were not examined for this index.

⬆ **significant change from 2014 (p<.001)**

⬆ **significant change from 2014 (p<.01)**

⬆ **significant change from 2014 (p<.05)**

Appendix Table E3

SUMMARY SUSTAINABILITY CULTURAL INDICATORS for STAFF/FACULTY, by CAMPUS SUB-REGIONS

(mean score differences)

2018	Central Campus West		Central Campus East		Health Sciences		North Campus	
	North	South	North	South	North	South	North	South
PRIMARY								
Climate Action								
Conservation Behavior	**6.5****	**7.5****	**6.9**	**7.1**	**6.6**	**6.8**	**7.1**	**7.6**
Number of respondents	159	91	105	81	135	83	153	45
Travel Behavior	**2.9*****	**1.1*****	**1.6***	**3.0***	**2.3**	**2.2**	**0.7**	**1.7**
Number of respondents	161	90	103	79	135	82	154	45
Waste Prevention								
Waste Prevention Behavior	**7.8**	**7.4**	**7.9**	**7.5**	**7.5**	**7.6**	**7.7**	**7.9**
Number of respondents	163	91	107	81	138	83	157	46
Healthy Environments								
Sustainable Food Purchases	**6.3**	**6.0**	**6.7****	**5.4****	**6.0**	**6.1**	**6.0***	**6.6***
Number of respondents	153	84	99	79	134	82	147	44
Community Awareness								
Sustainable Travel & Transportation	**3.8**	**3.1**	**3.4**	**3.5**	**3.6**	**3.7**	**3.0**	**3.4**
Number of respondents	160	91	106	80	138	83	157	46
Sustainable Foods	**5.5**	**5.5**	**5.5**	**4.8**	**5.2**	**4.8**	**5.2**	**5.3**
Number of respondents	161	91	107	81	138	83	157	46
U-M Sustainability Initiatives	**5.6**	**6.0**	**5.1**	**5.4**	**5.8**	**5.4**	**6.0**	**5.2**
Number of respondents	161	91	107	81	138	83	156	46
SECONDARY								
Sustainability Engagement at U-M-2	**1.2**	**1.7**	**1.1**	**1.6**	**0.7**	**1.0**	**1.2**	**1.7**
Number of respondents	157	91	107	79	136	83	154	45
Sustainability Engagement Generally	**3.0**	**3.0**	**2.9**	**3.3**	**2.6**	**2.9**	**2.9**	**3.2**
Number of respondents	162	90	106	81	136	83	156	46
Sustainability Commitment	**7.1**	**7.2**	**7.2**	**7.6**	**7.3**	**7.1**	**7.1**	**7.9**
Number of respondents	162	90	107	81	138	83	157	46
Rating U-M Sustainability Initiatives	**6.6**	**7.0**	**6.6**	**6.5**	**6.9****	**6.1****	**6.9**	**6.5**
Number of respondents	114	71	74	58	113	71	131	37

* significant difference between sub-regions (p<.05)

** significant difference between sub-regions (p<.01)

*** significant difference between sub-regions (p<.001)

Appendix Table E4

CHANGE IN SUSTAINABILITY CULTURAL INDICATORS
for STAFF/FACULTY, by CAMPUS AND REGION - 2012 & 2018

(mean scores)

INDICES	Central Campus West		Central Campus East		North Campus		Medical Campus		Health Sciences		Ross Athletic Campus (south)		East Campus	
	2012	2018	2012	2018	2012	2018	2012	2018	2012	2018	2012	2018	2012	2018
PRIMARY														
Climate Action														
Conservation Behavior	**7.1**	**6.9**	**7.0**	**7.0**	**7.0**	**7.2**	**5.8**	**5.8**	**6.7**	**6.7**	**7.6**	**7.0**	**6.7**	**6.1**
Number of respondents	357	250	235	186	277	198	476	342	321	218	78	35	84	66
Travel Behavior	**3.1**	**2.3**	**3.4**	**2.2**	**1.9**	**0.8**	**1.0**	**1.3**	**2.8**	**2.3**	**0.7**	**0.6**	**0.4**	**0.3**
Number of respondents	364	251	237	182	285	199	511	357	323	217	79	36	85	65
Waste Prevention														
Waste Prevention Behavior	**7.2**	**7.6**	**7.3**	**7.7**	**7.2**	**7.6**	**6.5**	**6.7**	**7.2**	**7.5**	**7.5**	**7.7**	**7.2**	**6.9**
Number of respondents	363	254	237	188	285	203	510	358	323	221	79	36	85	66
Healthy Environments														
Sustainable Food Purchases	**6.1**	**6.2**	**5.8**	**6.1**	**5.9**	**6.1**	**5.6**	**6.0**	**5.8**	**6.0**	**5.9**	**5.6**	**5.5**	**6.0**
Number of respondents	353	237	232	178	274	191	489	351	316	216	75	32	83	62
Community Awareness														
Sustainable Travel & Transportation	**3.8**	**3.5**	**3.8**	**3.4**	**3.6**	**3.1**	**2.6**	**2.7**	**3.6**	**3.6**	**3.5**	**3.5**	**2.8**	**2.4**
Number of respondents	363	251	237	186	284	203	508	360	322	221	79	36	85	66
Sustainable Foods	**5.3**	**5.5**	**5.2**	**5.2**	**4.9**	**5.3**	**4.7**	**4.9**	**4.9**	**5.0**	**4.9**	**4.7**	**5.0**	**4.2**
Number of respondents	364	252	237	188	285	203	511	364	323	221	79	36	85	66
U-M Sustainability Initiatives	**5.4**	**5.7**	**5.4**	**5.2**	**5.2**	**5.9**	**5.1**	**5.2**	**5.5**	**5.7**	**6.1**	**6.3**	**5.8**	**4.8**
Number of respondents	363	252	236	188	284	202	508	362	323	221	79	36	84	66
SECONDARY														
Sustainability Engagement at U-M-2	**++**	**1.4**	**++**	**1.3**	**++**	**1.2**	**++**	**0.3**	**++**	**0.8**	**++**	**2.2**	**++**	**0.6**
Number of respondents		248		186		199		358		219		36		63
Sustainability Engagement Generally	**2.6**	**3.0**	**2.4**	**3.1**	**2.2**	**3.0**	**1.7**	**2.3**	**2.3**	**2.7**	**2.1**	**2.4**	**1.9**	**2.5**
Number of respondents	363	252	236	187	285	202	511	361	321	219	79	35	84	66
Sustainability Commitment	**6.8**	**7.1**	**6.8**	**7.3**	**6.4**	**7.2**	**6.0**	**6.4**	**6.6**	**7.3**	**6.7**	**6.6**	**6.5**	**6.7**
Number of respondents	363	252	236	188	281	203	508	363	321	221	79	36	85	65
Rating U-M Sustainability Initiatives	**6.5**	**6.7**	**7.0**	**6.5**	**6.5**	**6.8**	**6.6**	**6.7**	**6.9**	**6.6**	**6.7**	**7.1**	**7.0**	**7.0**
Number of respondents	245	185	164	132	207	168	379	265	246	184	67	31	65	47

++ Indicates that not all questions used to the create the Sustainability Engagement at U-M-2 were asked in 2012

Appendix Table E5

CHANGE IN SUSTAINABILITY CULTURAL INDICATORS for STAFF/FACULTY, by CAMPUS AND REGION - 2015 & 2018

(mean scores)

INDICES	Central Campus West		Central Campus East		North Campus		Medical Campus		Health Sciences		Ross Athletic Campus (south)		East Campus	
	2015	2018	2015	2018	2015	2018	2015	2018	2015	2018	2015	2018	2015	2018
PRIMARY														
Climate Action														
Conservation Behavior	**7.3**	**6.9**	**7.0**	**7.0**	**6.9**	**7.2**	**5.9**	**5.8**	**6.7**	**6.7**	**7.0**	**7.0**	**6.4**	**6.1**
Number of respondents	370	250	263	186	286	198	371	342	318	218	65	35	80	66
Travel Behavior	**3.1**	**2.3**	**3.5**	**2.2**	**1.8**	**0.8**	**1.1**	**1.3**	**2.2**	**2.3**	**0.6**	**0.6**	**0.2**	**0.3**
Number of respondents	372	251	269	182	293	199	396	357	322	217	66	36	82	65
Waste Prevention														
Waste Prevention Behavior	**7.5**	**7.6**	**7.5**	**7.7**	**7.6**	**7.6**	**6.7**	**6.7**	**7.3**	**7.5**	**7.5**	**7.7**	**7.6**	**6.9**
Number of respondents	373	254	269	188	293	203	396	358	321	221	66	36	82	66
Healthy Environments														
Sustainable Food Purchases	**6.3**	**6.2**	**6.4**	**6.1**	**6.0**	**6.1**	**6.0**	**6.0**	**5.8**	**6.0**	**5.9**	**5.6**	**5.7**	**6.0**
Number of respondents	368	237	260	178	285	191	384	351	315	216	63	32	82	62
Community Awareness														
Sustainable Travel & Transportation	**3.7**	**3.5**	**3.7**	**3.4**	**3.5**	**3.1**	**3.0**	**2.7**	**3.8**	**3.6**	**3.2**	**3.5**	**3.0**	**2.4**
Number of respondents	372	251	267	186	292	203	395	360	322	221	66	36	82	66
Sustainable Foods	**6.0**	**5.5**	**5.7**	**5.2**	**5.2**	**5.3**	**5.2**	**4.9**	**5.5**	**5.0**	**5.0**	**4.7**	**5.1**	**4.2**
Number of respondents	373	252	269	188	293	203	396	364	322	221	66	36	82	66
U-M Sustainability Initiatives	**5.3**	**5.7**	**5.2**	**5.2**	**5.3**	**5.9**	**5.0**	**5.2**	**5.4**	**5.7**	**5.9**	**6.3**	**5.2**	**4.8**
Number of respondents	371	252	267	188	290	202	396	362	318	221	64	36	82	66
SECONDARY														
Sustainability Engagement at U-M-2	**1.6**	**1.4**	**1.8**	**1.3**	**0.8**	**1.2**	**0.7**	**0.3**	**1.4**	**0.8**	**1.8**	**2.2**	**0.8**	**0.6**
Number of respondents	364	248	264	186	268	199	393	358	317	219	64	36	81	63
Sustainability Engagement Generally	**2.8**	**3.0**	**2.3**	**3.1**	**2.1**	**3.0**	**1.8**	**2.3**	**2.0**	**2.7**	**1.6**	**2.4**	**1.9**	**2.5**
Number of respondents	373	252	268	187	290	202	396	361	320	219	66	35	81	66
Sustainability Commitment	**7.1**	**7.1**	**7.0**	**7.3**	**6.5**	**7.2**	**6.2**	**6.4**	**6.9**	**7.3**	**6.6**	**6.6**	**6.0**	**6.7**
Number of respondents	373	252	268	188	293	203	394	363	321	221	65	36	82	65
Rating U-M Sustainability Initiatives	**6.7**	**6.7**	**6.7**	**6.5**	**6.7**	**6.8**	**6.7**	**6.7**	**6.6**	**6.6**	**7.2**	**7.1**	**6.7**	**7.0**
Number of respondents	250	185	183	132	227	168	289	265	252	184	53	31	64	47

Appendix Table E6

STUDENT SUSTAINABILITY LITERACY QUESTIONS & RESPONSES

(percentage distribution)*

2018	**Cross Section**	**Panel**
ENVIRONMENT		
1. What is the most common cause of pollution of streams and rivers?		
a. Dumping of garbage by cities	13	9
b. Surface water running off yards, city streets, paved lots, and farm fields**	41	50
c. Litter near streams and rivers	5	4
d. Waste dumped by factories	18	15
e. Don't know	23	22
Total	**100**	**100**
2. Ozone forms a protective layer in the earth's upper atmosphere. What does ozone protect us from?		
a. Acid rain	2	1
b. Climate change	2	1
c. Sudden changes in temperature	2	2
d. Harmful UV rays	90	92
e. Don't know	5	3
Total	**100**	**100**
3. Which of the following is an example of sustainable forest management?		
a. Acid rain	12	10
b. Climate change	69	77
c. Sudden changes in temperature	2	1
d. Harmful UV rays	2	2
e. Don't know	15	10
Total	**100**	**100**
4. Of the following, which would be considered living in the most environmentally sustainable way?		
a. Acid rain	27	24
b. Climate change	49	61
c. Sudden changes in temperature	12	8
d. Harmful UV rays	0	0
e. Don't know	11	7
Total	**100**	**100**
SOCIAL		
5. Which of the following is the most commonly used definition of sustainable development?		
a. Creating a government welfare system that ensures universal access to education, health care, and social services	4	4
b. Setting aside resources for preservation, never to be used	3	2
c. Meeting the needs of the present without compromising the ability of future generations to meet their own needs	70	76
d. Building a neighborhood that is both socio-demographically and economically diverse	2	3
e. Don’t know	20	15
Total	**100**	**100**
6. Over the past 3 decades, what has happened to the difference between the wealth of the richest and poorest Americans?		
a. The difference has increased	84	90
b. The difference has stayed about the same	4	2
c. The difference has decreased	2	1
d. Don’t know	10	7
Total	**100**	**100**

Appendix Table E6 (continued)

STUDENT SUSTAINABILITY LITERACY QUESTIONS & RESPONSES

(percentage distribution)*

2018	Cross Section	Panel
ECONOMIC		
7. Many economists argue that electricity prices in the U.S. are too low because…		
a. They do not reflect the costs of pollution from generating the electricity	54	60
b. Too many suppliers go out of business	2	1
c. Electric companies have a monopoly in their service area	13	11
d. Consumers spend only a small part of their income on energy	2	1
e. Don't know	30	26
Total	**100**	**100**
8. Which of the following is the most commonly used definition of economic sustainability?		
a. Maximizing the share price of a company's stock	2	3
b. Long term profitability	43	44
c. When costs equal revenue	16	16
d. Continually expanding market share	5	4
e. Don't know	35	34
Total	**100**	**100**
ECONOMIC/ENVIRONMENTAL		
9. Which of the following countries passed the U.S. to become the largest emitter of the greenhouse gas carbon dioxide?		
a. China	81	83
b. Sweden	1	0
c. Brazil	2	2
d. Japan	2	2
e. Don't know	14	13
Total	**100**	**100**
10. Which of the following is a leading cause of the depletion of fish stocks in the Atlantic Ocean?		
a. Fishermen seeking to maximize their catch	28	30
b. Reduced fish fertility due to genetic hybridization	3	1
c. Ocean pollution	26	27
d. Global climate change	16	19
e. Don't know	28	23
Total	**100**	**100**
SOCIAL/ECONOMIC		
11. Which of the following is the best example of environmental justice?		
a. Urban citizens win a bill to have toxic wastes taken to rural communities	5	3
b. The government dams a river, flooding Native American tribal lands to create hydro-power for large cities	3	2
village	62	71
d. Multi-national corporations build factories in developing countries where environmental laws are less strict.	2	1
e. Don't know	29	23
Total	**100**	**100**
ENVIRONMENTAL/SOCIAL		
12. Put the following list in order of the activities with the largest environmental impact to those with the smallest environmental impact:		
A. Keeping a cell phone charger plugged into an electrical outlet for 12 hours		
B. Producing one McDonald's quarter-pound hamburger		
C. Producing one McDonald's chicken sandwich		
D. Flying in a commercial airplane from Washington D.C. to China		
a. A, C, B, D	5	5
b. D, A, B, C	21	14
c. D, C, B, A	9	8
d. D, B, C, A	47	57
e. Don't know	20	16
Total	**100**	**100**
Number of respondents	2938	977

* Percentage distributions are based on the weighted number of respondents to each question. The actual number of respondents for each question differs since not all questions were answered by all respondents. The minimum number of respondents is shown for the student cross section and panel.

**Correct answers in bold.

Appendix Table E7

SUSTAINABILITY LITERACY by STUDENT CLASS

(percentage distribution)**

2018	All Students	Undergraduate Students					Graduate Students
		Fresh	Soph	Junior	Senior	All	
No. of Correct Answers							
All (12)	4	2	4	4	4	3	6
(11)	10	7	8	7	10	8	14
(10)	12	11	12	10	11	11	14
(9)	14	12	13	19	14	14	15
(8)	16	16	14	16	15	15	17
(7)	10	12	11	7	12	11	8
(6)	10	10	11	11	8	10	9
(5)	7	7	8	6	9	8	6
(4)	6	7	5	7	7	6	5
(3)	5	6	7	6	3	6	3
(2)	3	4	2	3	3	3	2
(1)	2	3	2	2	2	2	2
None (0)	2	3	3	2	3	3	1
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**
Mean	**7.4**	**6.8**	**7.1**	**7.2**	**7.4**	**7.1**	**8.0**
Mean (latent)*	**7.0**	**6.5**	**6.8**	**6.9**	**7.0**	**6.8**	**7.7**
Number of respondents	3040	1253	732	346	270	2601	437

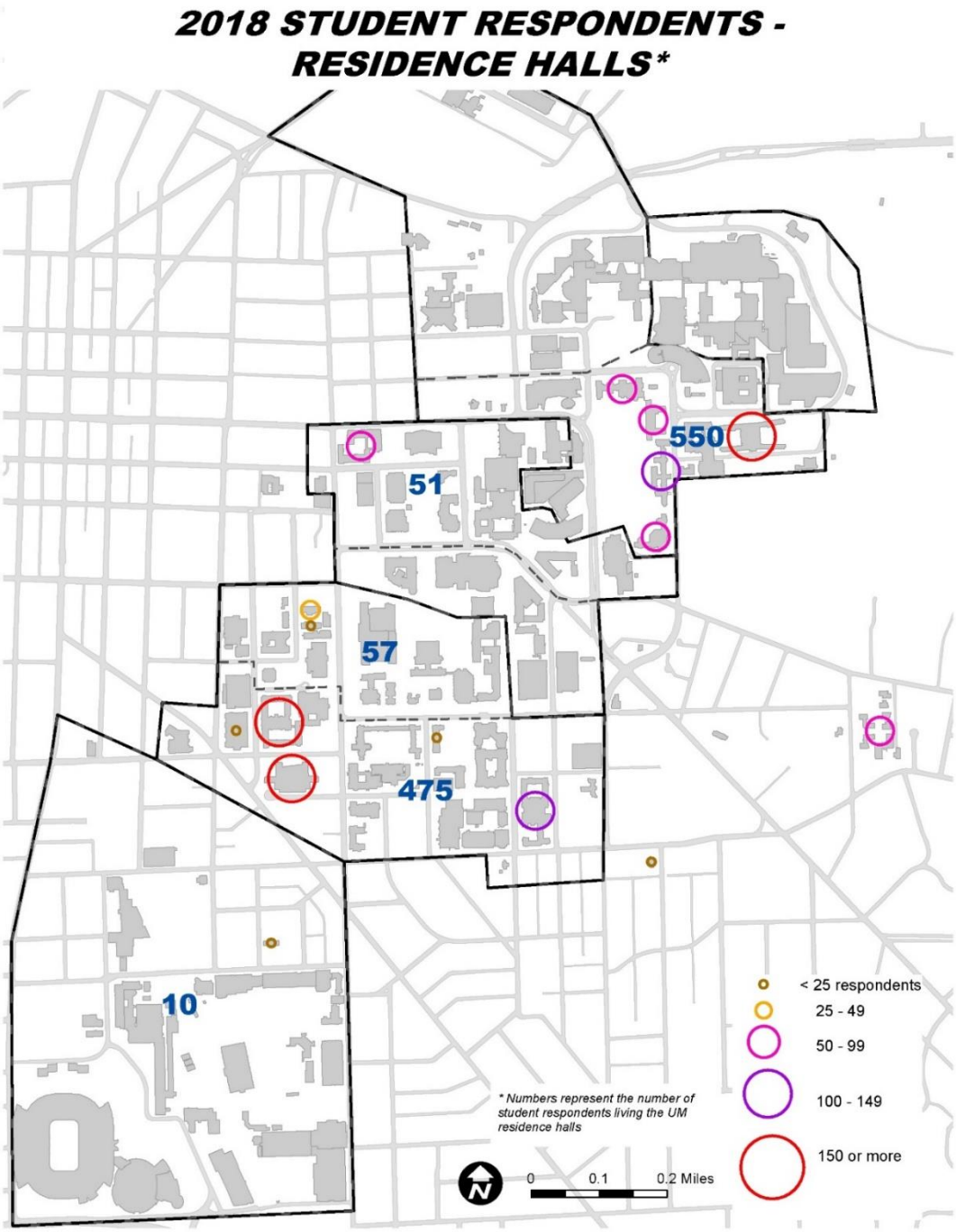
*** The latent mean score reflects the degree of difficulty of each of the 12 questions asked to measure Sustainability Literacy. It is determined by number of correct answers to each question relative to the number of correct answers to all other questions.**

**** Percentage distributions are based on the weighted number of respondents to each question. The actual number of respondents for each question differs since not all questions were answered by all respondents.**

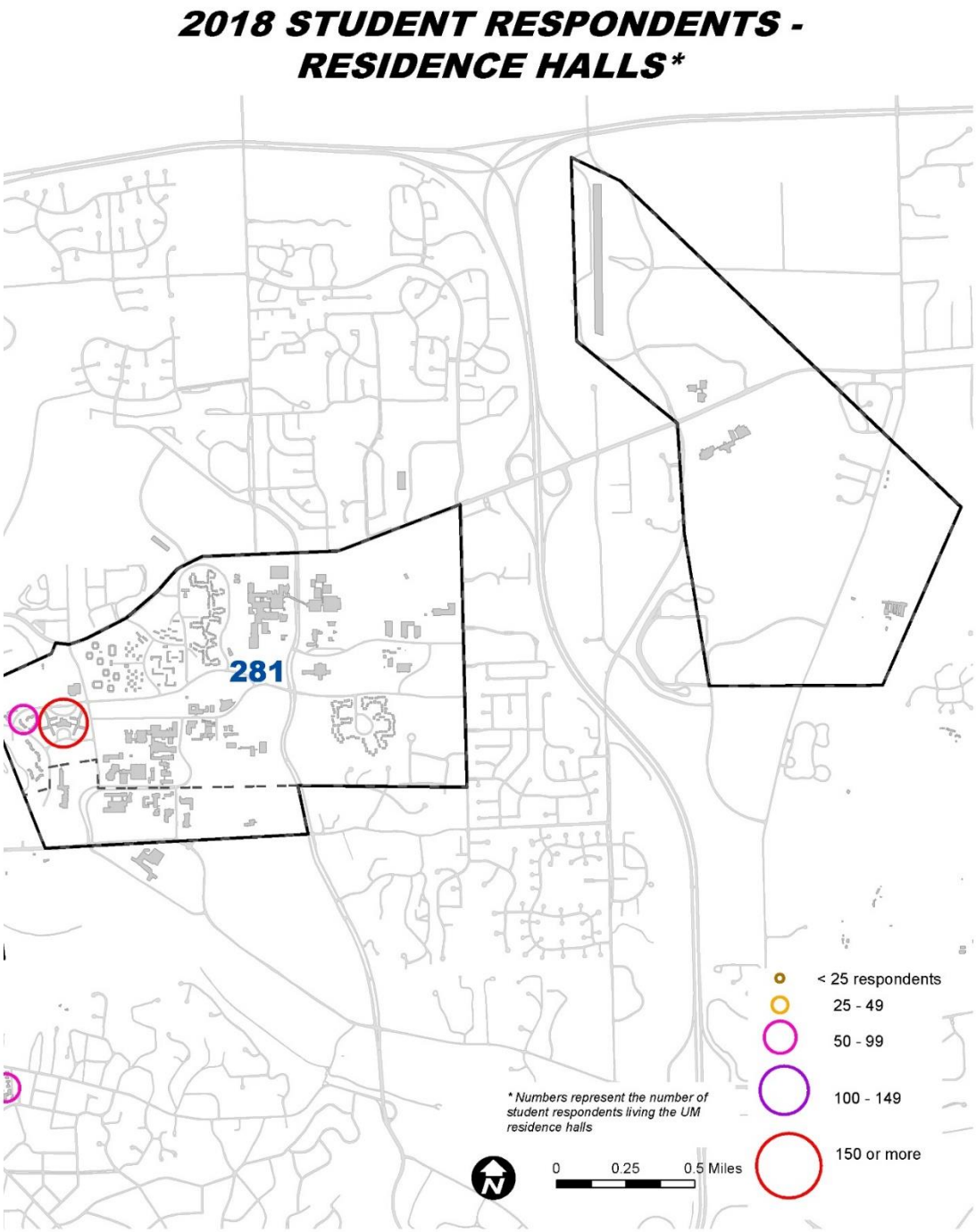
Appendix F: Supplemental Maps – 2018

The following maps show the number and spatial distribution of students, staff, and faculty that responded to the 2018 survey. The maps cover each U-M campus, region, and sub-region in Ann Arbor. The student maps show the location of the residence halls where respondents lived, the U-M building where they spent more than half of their time, and approximate number of respondents in each. The maps covering U-M employees (staff and faculty) show the U-M buildings where they primarily worked and the approximate number of respondents from each building. The maps suggest possible geographic units for subsequent spatial analysis of the survey data. The maps do not show the place of residence for student respondents living off-campus nor the places of employment for staff and faculty respondents working in rented space or in U-M buildings outside Central Campus, North Campus, South Campus, East Campus, and the Medical Campus.

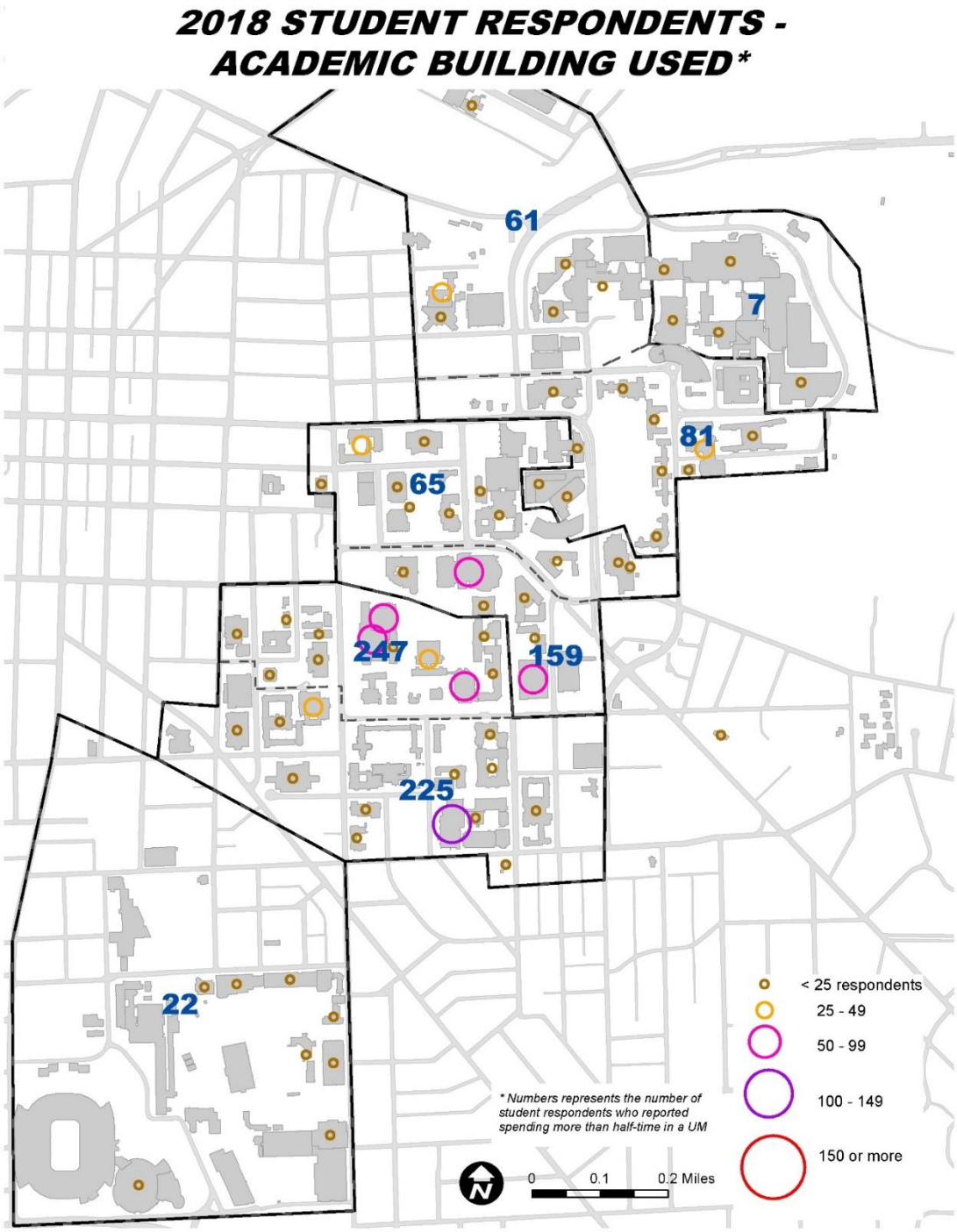
Appendix Figure F1



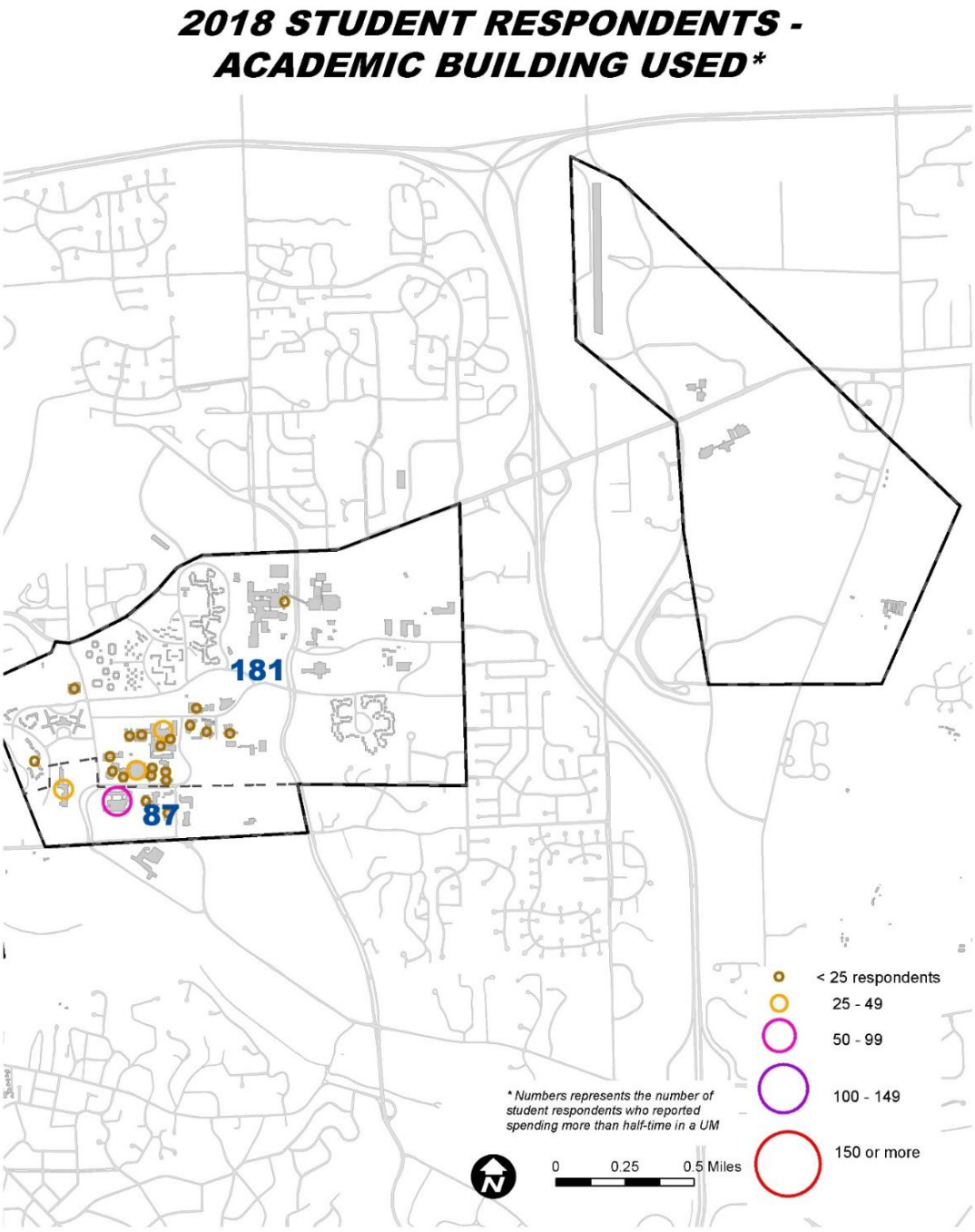
Appendix Figure F2



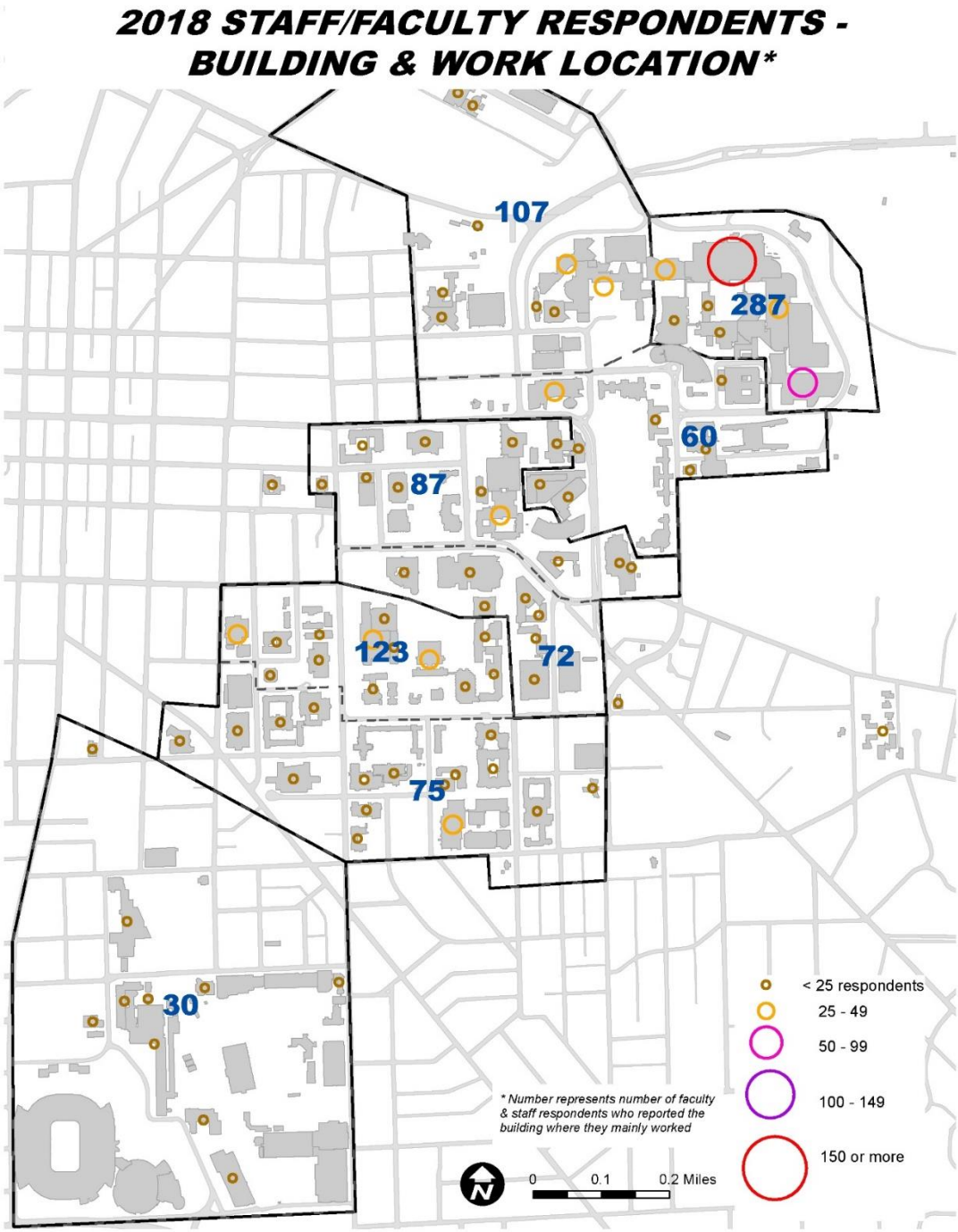
Appendix Figure F3



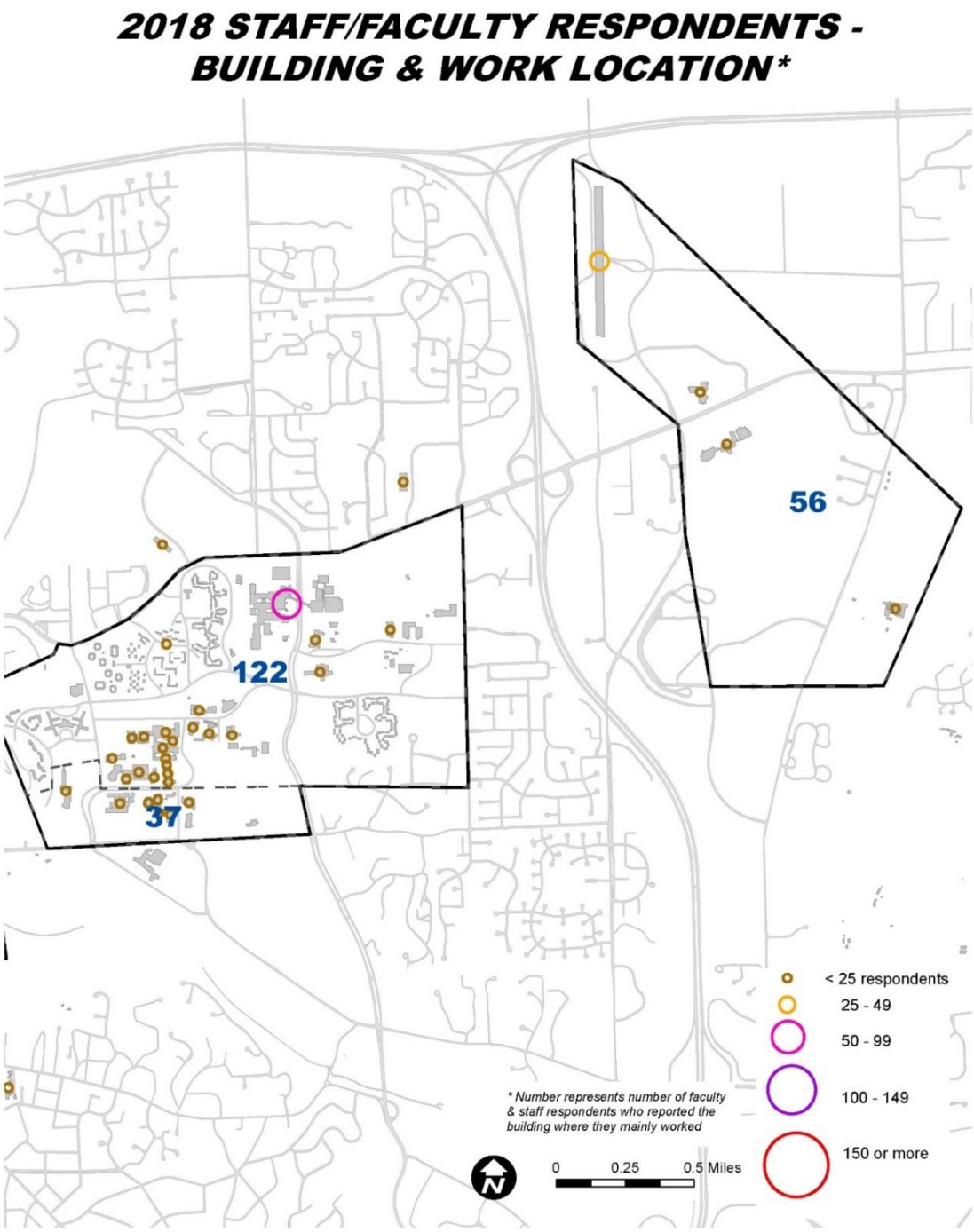
Appendix Figure F4



Appendix Figure F5



Appendix Figure F6



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