Measuring Progress Over Time: The Sustainability Cultural Indicators Program at the University of Michigan

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Abstract

The Sustainability Cultural Indicators Program (SCIP) is a multi-year project designed to measure and track the *culture of sustainability* at the University of Michigan. 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. This paper presents findings from three years of data collection (2012–2014)—focusing on trends in responses from over 17,000 students, faculty, and staff. One of the most positive findings is that respondents report increasing levels of sustainability knowledge over time. However, SCIP results indicate that there is considerable room for improvement with regard to pro-environment behavior, engagement, and expressed commitment to sustainability. Finally, a brief overview is provided of how SCIP results are being used by multiple units on campus to guide programming and how SCIP is informing efforts at other institutions.

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1 Introduction

1.1 Campus Sustainability Integrated Assessment

In October 2009, former University of Michigan (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.[1] 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 builds 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 US$10M.

The geographic scope of the CSIA spanned the five Ann Arbor campuses (South, Central, Medical, North and East Medical), which currently includes over 3 million square meters of teaching, research, health care, athletics and administrative building space. In 2014, these buildings served more than 80,000 occupants—students, faculty and staff (University of Michigan 2015). Total campus operations generated over 700,000 metric tons of carbon dioxide emissions (Office of Campus Sustainability 2014). Additional information on sustainability at the University of Michigan can be found on the Planet Blue website—the main sustainability portal for academic, research, and operations initiatives.[2] The magnitude of U-M campus operations suggests that aggressive sustainability goals for University campus operations could have significantly positive environmental, fiscal, and health impacts.

The final CSIA report outlines four high level themes—*Climate Action*, *Waste Prevention*, *Healthy Environments*, and *Community Awareness*. Accompanying the

[1]The Council is 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.

[2]The Planet Blue website can be found at: http://sustainability.umich.edu/.

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.

1.2 The Sustainability Cultural Indicators Program

Institutions of higher education play a pivotal role in addressing the more difficult yet powerful part of the sustainability transition. That role is in creating and maintaining a "culture of sustainability" among members of the university community. A culture of sustainability has been defined as "a culture in which individuals are aware of major environmental (and social/economic) challenges, are behaving in sustainable ways, and are committed to a sustainable lifestyle for both the present and future" (Marans et al. 2010, 2014). To achieve this ideal state within institutions of higher education, Sharp (2002) calls for a rethinking of organizational action and actors that questions the prevailing assumptions of organizational rationality that stays within the confines of the current systems. Similarly, Senge (2000) stresses the importance of cultivating a "learning organization," rather than a "knowing organization" since change at higher education institutions is a "complex learning and unlearning process for all concerned" (Scott 2004). Therefore, nothing less than a paradigmatic shift in organizational thinking is needed for colleges and universities to promote cultural transformation.

This organizational transformation is needed in all sectors of society. Yet institutions of higher education can and should be at the forefront with the collective mission of fostering sustainability through our actions and through cultivating future sustainability leaders. To date, however, most campus sustainability efforts stop either at "greening" or at the level of institutional commitments to eco-efficiency, climate and waste mitigation, and increasing environmental education. Though calls for institutional and cultural transformation are multiplying at a rapid rate, rarely do institutions address the deeper cultural change necessary to transform into sustainable organizations which empower citizens with a sustainability perspective; instead, focus is often on implementing many individual projects, isolated initiatives, or broad commitments (Sharp 2002, 2009). This is partly attributable to the lack of guidance for institutions attempting to follow this more uncertain and uncomfortable path. However, it should be noted that the Association for the Advancement of Sustainability in Higher Education is doing much to support these efforts through their Sustainability Tracking, Rating & Assessment System (STARS) which is used by hundreds of institutions. The 2.1 version of STARS asks institutions to report on both their sustainability literacy assessment efforts and assessing a culture of sustainability (AASHE 2016). In addition the

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

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 and 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
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 %*), and • 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*

works of Bartlett and Chase (2004, 2013) have done much to chronicle institutional sustainability transformation efforts.

U-M cultural change initiatives stem from the principles outlined under CSIA theme of Community Awareness. They indicate that the U-M will "pursue evaluation strategies toward a campus-wide ethic of sustainability" as articulated in 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." The evaluation strategies involve a groundbreaking program for monitoring the U-M's progress in moving toward a culture of sustainability. Progress would be determined by an annual survey of students, faculty and staff regarding sustainability awareness and behavior and tracking changes over time.

To create the surveys, a small group closely involved with the CSIA met for over a year working on what came to be known as the Sustainability Cultural Indicators Program (SCIP). The group started by examining the recommendations from the Campus Integrated Assessment Culture Team report, reviewed related literature, spoke to key national leaders working on similar efforts, ran focus groups with students and staff to determine current understandings of sustainability, and analyzed more than thirty existing campus surveys from numerous institutions (including the U-M) about topics such as recycling, transportation, etc.

One of the most useful resources for this work was the North American Association for Environmental Education's report "Developing a Framework for Assessing Environmental Literacy" (Hollweg et al. 2011). It provided a very useful frame for developing questions under three categories; knowledge, dispositions or attitudes, and behavior. This went beyond many of the existing campus surveys which focused primarily on sustainability literacy or environmental literacy, or which focused exclusively on operational outcomes.

SCIP uses two questionnaires—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, while staff and faculty survey questions are primarily set within a time frame of the past year, students are often asked to answer questions based on their experiences since the start of the fall semester. Also, students 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. Staff and faculty demographic questions are asked at the end of the survey. As a primary objective of SCIP is to work 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. In addition to the student questionnaire there is a slightly shorter version which is sent to members of an undergraduate student panel who are asked to complete the survey each year during their undergraduate studies. The panel was included in the research plan so as to determine if and how the behaviors and views of individual students change during their period of undergraduate study at the University. The average time to complete the online survey is about 15 min. Figure 1 offers an example of a SCIP question.

Table 2 offers an overview of the question type and modules. In total, the questionnaires each contained approximately 242 questions although respondents could skip any question they did not want to answer and responses to some questions generated a skip sequence for subsequent questions. A limited number of modifications have been made to the questionnaires each year—adding questions, deleting questions, or clarifying questions—with the goal of as little modification as possible to avoid increasing the amount of time required by respondents to complete the survey and to allow for as much longitudinal analysis as possible.

Q8. How much do you know about the following at U-M?	A lot	A fair amount	A little	Not much/ nothing
a. Recycling glass	○	○	○	○
b. Recycling plastic	○	○	○	○
c. Recycling paper	○	○	○	○
d. Recycling electronic waste (i.e. computers, cell phones)	○	○	○	○
e. Property Disposition Services	○	○	○	○
f. Composting	○	○	○	○

Fig. 1 SCIP question example

Table 2 SCIP survey questions by module and question type

Survey module	Question type					
	Knowledge	Disposition	Behavior	Other	Demographics	Total
Transportation	9	10	21	1	0	41
Conservation	5	5	33	1	0	44
Environment	4	2	9	1	0	16
Food	7	6	19	2	0	34
Climate	1	2	0	2	0	5
Sustainability (gen)	0	20	13	3	0	36
U-M efforts	8	0	8	8	0	24
Demographics	0	0	0	0	42	42
Total	34	45	103	18	42	242

2 Population and Sample

In order to ensure proportional representation from all segments of the University community and from all geographic parts of the Ann Arbor campus, the sample design aims to obtain relatively large numbers from the entire student body and from the population of staff and faculty. Specifically, a stratified sample is selected by the Registrar's Office so as to yield approximately 1000 respondents from the freshmen class, 350 respondents from each of the sophomore, junior and senior classes, and 400 graduate student respondents. For the undergraduate panel, graduating seniors are replaced with the freshmen from the prior year with approximately 300 sophomores, juniors and seniors completing the survey in the years following their first year to yield 900 panel respondents. Finally, a stratified

Table 3 Completed surveys by population and campus response rates; 2012–2014

Population	Year		
	2012	2013	2014
Students (undergrad and grad)	4018	2396	3172
Panel (undergrad)		841	1048
Faculty and staff	2166	1547	2149
All campus response rate (%)	44	22	29

sample is selected by the University's Office of Human Resources with a target of 750 staff and 750 faculty members (Hupp 2016).

The actual number of respondents and the response rates for 2012–2014 are shown in Table 3. The lower response rates in 2013 were attributed to U-M's transition to Gmail during the period of the SCIP data collection and the fact that many emails with links to questionnaires ended up in SPAM folders. New email distribution plans were implemented in 2014 and response rates improved. Completion of questionnaires is attributable to several factors including the personalized pre-notification email encouraging participation from the U-M President, a series of reminder e-mails from a different U-M head coach each year, and an opportunity for respondents to participate in a gift card drawing.

3 Findings

Results from the questionnaires are shared in several ways with the U-M campus community and others. Each year an annual report is prepared which provides detailed information on the respondent population and response distribution tables for nearly every question. In addition, a publicly available composite table is maintained online for sharing the results to questions and how responses are changing over time or staying the same. Where indicated, statistical significance is reported between the current year and the previous year, and the current year and the first year of data collection (2012). The SCIP teams holds multiple meetings throughout the year with staff from various campus operations units (transportation, dining services, health system, etc.), students and faculty to discuss the results and determine ways in which the results can be used to guide future programming, education, and research efforts. An example of how results are shared in the composite table can be found in Table 4.

In order to summarize findings covering key concepts reflecting a culture of sustainability, indices were created that combined responses to closely related questions about a common idea, concept, or action. 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.

Table 4 Select results for all students regarding transportation to campus, 2012–2014

Travel and transportation items (percentage distributions)	All students		
	2012	2013	2014
During the past year, how often did you do the following to travel from where you lived and campus:			
Drive a car and park on campus			
Never	54	51	51
Rarely	20	19	20
Sometimes	16	21	18
Always/most of the time	10	9	11
Number of respondents	3961	2293	3170
Significance between current year and previous year		n.s.	n.s.
Significance between current year and 2012		n.s.	$p < 0.05$
Walk			
Never	15	17	14
Rarely	7	5	7
Sometimes	16	14	17
Always/most of the time	62	64	62
Number of respondents	3981	2287	3164
Significance between current year and previous year		n.s.	$p < 0.05$
Significance between current year and 2012		n.s.	n.s.
Bike			
Never	68	66	67
Rarely	9	11	10
Sometimes	12	14	12
Always/Most of the time	11	11	11
Number of respondents	3902	2253	3124
Significance between current year and previous year		n.s.	n.s.
Significance between current year and 2012		n.s.	n.s.

For most of the indices, the number of response categories to their respective questions was identical.[4] 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.

[4]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 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 zero-to-ten 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 the new maximum value (12), so that the new index score would be between 0 and 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.[5] In total 15 indicators were created. Ten primary indicators reflect U-M's campus sustainability goal areas and 5 secondary indicators reflect other key sustainability issues. Items used to create the indicators are shown in Table 5.

As shown in Table 6, several key items can be identified when reviewing the results from 2012 to 2014. First, there is considerable room for improvement with regard to pro-environment behavior, levels of awareness, degrees of engagement and expressed commitment to sustainability among members of the University community. Second, the travel behavior of students is more in line with the goal of greenhouse gas reduction than travel to and from campus by the staff and faculty. Not surprisingly, students are most likely to walk, bike, or bus to campus. Similarly, students are likely to know more about transportation options available to them and are more engaged than either staff or faculty in sustainability activities on campus.

Third, compared to students and staff, faculty tend to report acting in a more sustainable manner with respect to conserving energy, preventing waste, purchasing food, and more generally, engaging in pro-environmental activities outside the University. Faculty members also express a higher level of commitment to

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

Table 5 Items used for creating sustainability indicators

Name of index	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
Travel behavior	Most often mode of travel to campus since fall semester	1
Waste prevention		
Waste prevention behavior	Print double-sided, recycle paper, etc., use reusable cups, etc., use property disposition	4
Healthy environments		
Sustainable food purchases	Buy sustainable food, organic, locally-grown	3
Protecting the natural environment	Use fertilizer, herbicides, water lawn	3
Community awareness		
Sustainable travel and transportation	Ann Arbor Area Transportation Authority, UM buses, biking, Zipcar rental	4
Waste prevention	Recycle glass, plastic, paper, electrical waste, property disposition	5
Natural environment protection	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
U-M sustainability initiatives	Save energy, encourage bus or bike, promote ride sharing, recycling, sustainable food, reduce greenhouse gas, maintain grounds, protect Huron River	8
Secondary		
Sustainability engagement at U-M	Participate in sustainability organization, Earthfest, took a sustainability course (not for staff/faculty)	3
Sustainability engagement generally	Give money, voting, volunteering, serving as officer	4
Sustainability commitment	How committed to sustainability?	1
Sustainability disposition	Willingness to pay for expanded waste prevention, alternative transportation, and greenhouse gas reduction efforts at UM	3
Rating U-M sustainability initiatives	Save energy, encourage bus or bike, promote ride sharing, recycling, sustainable food, reduce greenhouse gas, maintain grounds, protect Huron River	8

sustainability than staff or students. Fourth, students tend to be less knowledgeable than staff or faculty about protecting the natural environment, preventing waste, and sustainable foods. However, they know as much as faculty about sustainability at

Table 6 Change in sustainability (mean sources) for all students, Staff and faculty—2012, 2013, 2014

Indices	All students			Staff			Faculty		
	2012	2013	2014	2012	2013	2014	2012	2013	2014
PRIMARY									
Climate Action									
Conservation Behavior	6.1	6.2	6.1	6.6	6.7	6.5	6.9	6.9	7.0
Travel Behavior	7.6	7.5	7.4	1.6	1.3	1.6	2.2	2.0	1.8
Waste Prevention									
Waste prevention behavior	6.6	6.6	6.7	7.0	7.0	6.5	7.3	7.3	7.4
Healthy Environments									
Sustainable food purchases	5.5	5.3	5.6	5.7	5.8	5.8	6.3	6.2	6.3
Protecting the natural environment	8.6	8.9	8.8	6.5	6.4	6.6	6.1	6.1	6.4
Community Awareness									
Sustainable travel and transportation	4.4	4.3	4.2	3.0	3.0	3.1	3.4	3.3	3.3
Waste prevention	4.0	4.2	4.2	5.0	5.1	5.0	5.1	5.4	5.5
Natural environment protection	3.1	3.3	3.4	4.1	4.3	4.3	4.3	4.6	4.6
Sustainable foods	4.3	4.5	4.8	4.7	5.1	5.0	5.6	5.7	5.7
U-M sustainability initiatives	5.1	5.1	5.0	5.4	5.6	5.3	4.9	5.1	5.0
SECONDARY									
Sustainability engagement at U-M	1.3	1.4	1.6	0.9	0.7	0.7	0.7	0.7	0.7
Sustainability engagement generally	1.9	1.8	2.0	1.9	1.9	1.8	3.0	2.9	3.0
Sustainability commitment	6.3	6.3	6.3	6.3	6.4	6.4	7.0	7.2	7.1
Sustainability disposition	3.5	3.3	3.4	2.9	2.6	2.5	5.3	4.6	5.0
Rating U-M sustainability initiatives	6.6	6.4	6.5	6.7	6.8	6.6	6.4	6.5	6.4

Significant change from 2012 (p<.001); Significant change from previous year (p<.001)
Significant change from 2012 (p<.01); Significant change from previous year (p<.01)
Significant change from 2012 (p<.05); Significant change from previous year (p<.05)

the University. Nonetheless, staff are most aware of the full range of the University's sustainability initiatives.

Finally, a review of the indicator scores from 2012 to 2014 shows that members of the University community report being more knowledgeable about sustainability over time. In some instances, indicator scores for 2014 are significantly higher than 2012 scores and/or higher than the 2013 scores. In the case of sustainable foods, significant positive changes between the 2014 score for students and both the 2012 and 2013 scores reflect a growing understanding of sustainable foods over the 3 years. In addition, the indicator score for student engagement (participate in a sustainability organization or took a sustainability course) revealed a statistically significant increase from 2012 to 2014.

The relatively large numbers of student, faculty and staff respondents each year enable the production of index scores for each of Ann Arbor's campuses, regions, and sub-regions of the most populated regions. The regions are based on similar regions developed by U-M's energy management teams (see Fig. 2). These different geographic areas present opportunities to conduct experiments or trial programs in some places and not in others in order to determine the impact of new initiatives. An example of the mapping work which can be done based on these regions is provided in Fig. 3.[6]

[6]Additional regional analyses can be found in the SCIP Annual Reports available at: https://graham.umich.edu/campus/scip.

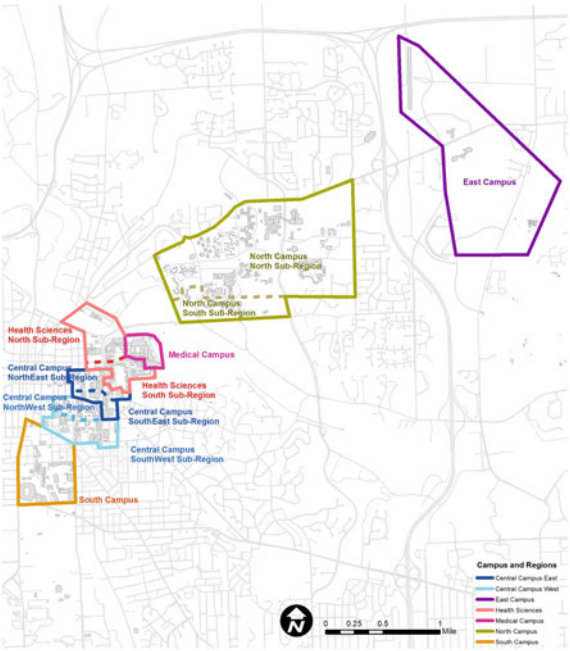

Fig. 2 Campus regions and subregions

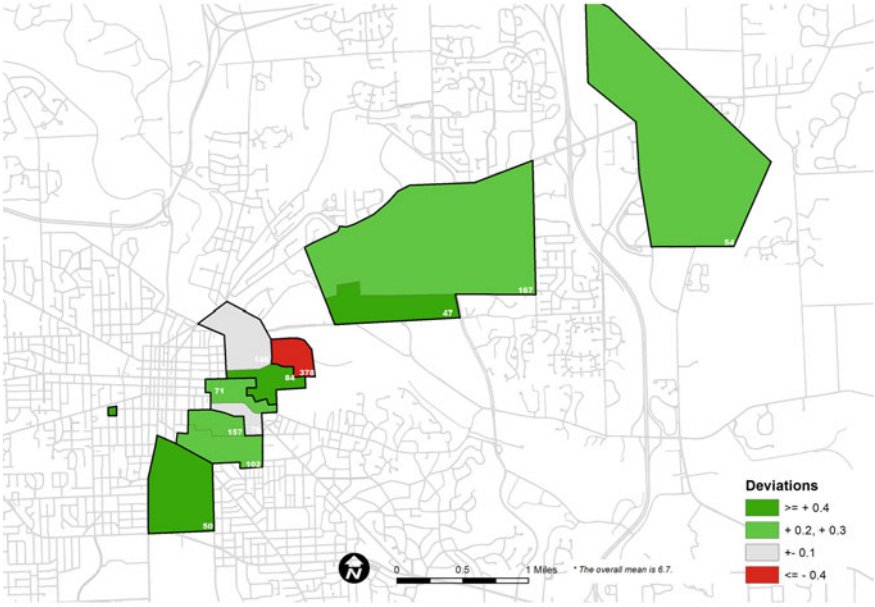

Fig. 3 Staff and faculty conservation behavior index mean deviation (2013) by Campus Region and Subregion (numbers in regions show number of respondents)

4 Going Forward

As noted above, the relatively large numbers of student, faculty and staff respondents each year and the creation of campus wide and regional indices present opportunities to conduct experiments or trial programs in some places and not in others in order to determine the impact of new initiatives. Current regional outreach efforts by the U-M Energy Management Group, a composting initiative by Student Life, and an assessment and recommendations regarding "barriers to recycling" are examples of how SCIP data is being used to gauge impact and guide programming. Such efforts are examined in more detail in a related SCIP paper (Marans and Callewaert 2016). In addition, we have begun to examine SCIP data in relation to contextual or environmental data derived from other sources such as metrics for campus energy use and recycling rates.[7] Furthermore, a graduate level course is also being developed for students to work with SCIP data each fall, develop programming interventions to support greater pro-environmental behavior, and for subsequent cohorts of students to test hypotheses based on SCIP data collected in the future.

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. 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 (Michels and Preston 2015).

Ongoing analysis of panel data is also providing important insights into promoting a culture of sustainability among the undergraduate population. Findings show that contrary to expectations, there was no difference in level of engagement between sophomores, juniors, and seniors who participated in the panel. Nonetheless, engagement of individual students increased over the one year period. At the same time, 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 during the two years. Finally, the analyses show that higher levels of student engagement directly increase awareness of waste prevention behavior which in turn, alter waste prevention and conservation behaviors.

Finally, following the release of the Year 1 report a program website was developed to share key results and materials. During 2015 there were over 1000 views of the program website and the SCIP annual reports are one of the top ten file downloads from the Graham Sustainability Institute website.[8] More than 100 requests have been received for copies of the survey instruments from other institutions and there have been preliminary conversations about creating a common

[7]Initial results from this work can be found in the Year 3 report found at: http://graham.umich.edu/campus/scip/materials.

[8]The project website can be found at: http://graham.umich.edu/campus/scip.

instrument across institutions. In addition, two short animated videos have been prepared 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.

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 are eager to see the program replicated 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 be successful, consideration needs to be given to shifting toward a culture of sustainability. The University of Michigan is doing so as part of its overall sustainability initiative and SCIP is the vehicle for measuring that change and assessing its impacts.

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Robert W. Marans PhD FAICP is Research Professor at the University of Michigan's Institute for Social Research and Professor Emeritus of Architecture and Urban Planning in the university's Taubman College of Architecture and Urban Planning. For more than three decades, he has conducted evaluative studies and research dealing with various aspects of communities, neighborhoods, housing, and parks and recreational facilities. His research has focused on user requirements and the manner in which attributes of the physical and sociocultural environments influence individual and group behavior and the quality of community life. Dr. Marans' most recent book, *Investigating Quality of Urban Life: Theory, Methods, and Empirical Research* was published by Springer (2011). His current research considers the impact of the built and natural environments on quality of life, the role of neighborhood in the health of Detroit residents, and issues of sustainability and energy conservation in buildings and institutional settings.