GRAHAM
SUSTAINABILITY INSTITUTE
UNIVERSITY OF MICHIGAN

The Sustainability Cultural Indicators Program (SCIP)

January 2016

Agenda

-Overview of SCIP and the datasets

-Key findings

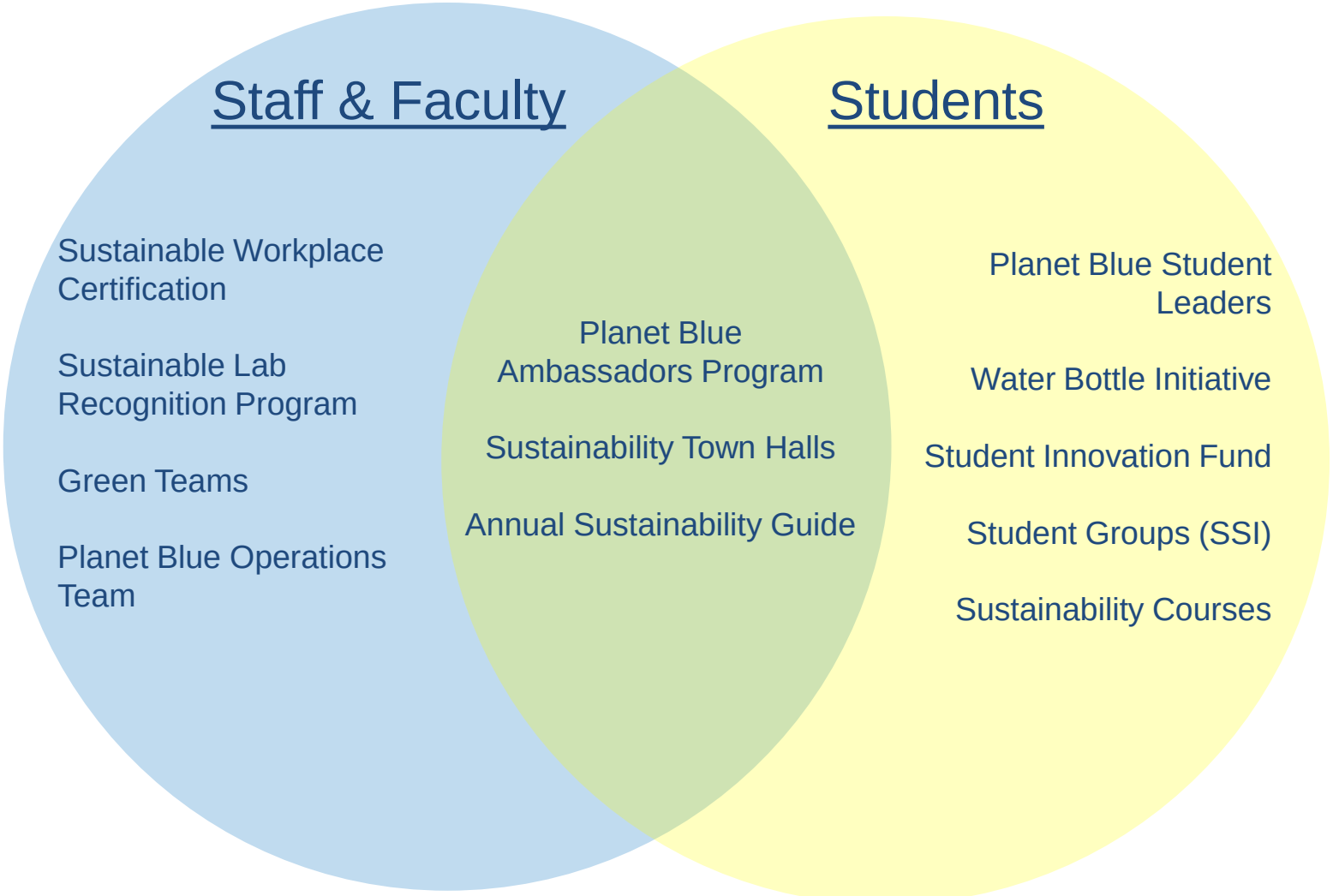
-Examples of supplemental analyses by SCIP team

-Examples of how university staff have been using SCIP data to inform their work

-Questions and discussion

Theme	Guiding Principle	2020 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 scope 1 & 2 greenhouse gas emissions by **25%**. Decrease carbon intensity of passenger trips on U-M transportation options by **30%.**
 **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%**
 **Healthy Env.**	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 in accordance with U-M Sustainable Food Purchasing Guidelines. Protect Huron River quality by reducing runoff from impervious surfaces 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.	No formal goal adopted, but U-M will invest in programs to educate our community, track behavior, and report progress over time.

Building a Culture of Sustainability: Engagement & Education



The Big Picture

Research Design

WEB SURVEYS– annually

Undergraduate students (2000)
Graduate students (400)
Staff (750)
Faculty(750)

Undergraduate student panel (800)

Annual response rates 2012-2014: 22-44%

Questionnaire Content

	QUESTION TYPE					
SURVEY MODULE	Knowledge	Disposition	Behavior	Other	Demographics	Total
Travel &Transp.	9	10	21	1	0	41
Cons. & Waste Prev.	5	5	33	1	0	44
Natural Environm't	4	2	9	1	0	16
Food	7	6	19	2	0	34
Climate	1	2	0	2	0	5
Sustainability (general)	0	20	13	3	0	36
Univ. of Michigan	8	0	8	8	0	24
Demographics	0	0	0	0	42	42
Total	34	45	103	18	42	242

Sample Questions

UNIVERSITY OF MICHIGAN

Sustainability Cultural Indicators Progr

These questions are about ***waste prevention and conservation***.

How much do you know about the following at U-M?

	A lot	A fair amount	A little	Not much/ nothing
Recycling glass	○	○	○	○
Recycling plastic	○	○	○	○
Recycling paper	○	○	○	○
Recycling electronic waste (i.e. computers, cell phones)	○	○	○	○
Property Disposition Services	○	○	○	○
Composting	○	○	○	○
The energy consumption of the building where you work	○	○	○	○
The energy conservation features of the building where you work	○	○	○	○

Next >>

<< Back

Resources

- Annual Reports (2012, 2013, 2014)
  - Response distribution tables
  - Maps
  - Indicators

- Datasets and Codebooks (2012, 2013, 2014)
  - Students (Undergraduate and Graduate)
  - Faculty & Staff
  - Undergraduate Panel

- Composite Table of results from each year

Appendix Table C4

WASTE PREVENTION & CONSERVATION - AWARENESS

(percentage distribution)*

2014	All Students	Undergraduate Students					Graduate Students	Staff	Faculty
		Fresh	Soph	Junior	Senior	All			
How much do you know about:									
Recycling glass									
A lot	16	11	14	15	17	14	20	21	27
A fair amount	31	28	26	35	30	30	34	30	33
A little	32	33	37	31	38	35	25	28	26
Not much//nothing	21	28	23	19	15	21	21	21	14
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**
Recycling plastic									
A lot	21	20	23	19	23	21	22	24	28
A fair amount	38	39	36	41	36	38	37	34	37
A little	30	29	31	30	33	31	28	28	26
Not much//nothing	11	12	10	10	8	10	13	14	9
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**
Recycling paper									
A lot	27	25	31	25	26	26	27	33	37
A fair amount	39	39	36	42	38	39	40	36	37
A little	26	27	25	27	31	28	23	24	21
Not much//nothing	8	9	8	6	5	7	10	7	5
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**
Recycling electronic waste									
A lot	5	4	5	5	6	5	6	12	14
A fair amount	14	11	12	12	17	13	14	21	27
A little	33	28	34	36	34	33	33	34	34
Not much//nothing	48	57	49	47	43	49	47	33	25
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**
Property Disposition services									
A lot	5	3	5	4	5	4	5	15	15
A fair amount	10	8	6	7	12	9	13	23	27
A little	21	18	19	23	21	20	23	29	30
Not much//nothing	64	71	70	66	62	67	59	33	28
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**
Composting									
A lot	5	4	4	6	6	5	4	5	5
A fair amount	11	12	9	11	10	10	13	9	8
A little	27	26	31	28	32	29	24	23	22
Not much//nothing	57	58	56	55	52	56	59	63	65
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**

WASTE PREVENTION & CONSERVATION BEHAVIOR OVER TIME

(percentage distribution)

Waste Prevention & Conservation Items	STUD QUES	FCST	All Students 2012	2013	2014	2015	2016	2017
How often do you do the following:								
Set thermostat to 65 degrees or lower during cool or cold weather	Q37	Q44						
Never			19	20	18			
Rarely			18	19	18			
Sometimes			23	24	24			
Always/Most of the time			23	20	23			
Not applicable			17	17	17			
Total			**100**	**100**	**100**			
Number of respondents			3204	2395	3178			
Signif. between current yr. and prev. yr.				n.s.	n.s.			
Signif. between current yr. and 2012				n.s.	n.s.			
Set thermostat (a/c) to 78 degrees or higher during warm of hot weather	Q38	Q45						
Never			24	28	27			
Rarely			17	17	19			
Sometimes			20	19	17			
Always/Most of the time			17	14	15			
Not applicable			22	22	22			
Total			**100**	**100**	**100**			
Number of respondents			3032	2396	3171			
Signif. between current yr. and prev. yr.				p<.01	n.s.			
Signif. between current yr. and 2012				p<.01	p<.01			

Selected Key Changes - Items

INCREASING

- Sustainable Food - Awareness
- Sustainable Food - Behavior
- U-M Sustainability Engagement

MIXED

- Waste Prevention & Conservation - Awareness
- Waste Prevention & Conservation - Behavior

DECREASING

- U-M Sustainability Efforts - Awareness
- U-M Sustainability Efforts - Rating

Sustainability Cultural Indicators

Primary

Climate Action
- Travel Behavior (1)
- Conservation Behavior (4)

Waste Prevention
- Waste Prevention Behavior (4)

Healthy Environments
- Protecting the Natural Environment (3)
- Sustainable Food Purchases (3)

Community Awareness
- Travel and Transportation (4)
- Waste Prevention (5)
- Natural Environment Protection (4)
- Sustainable Foods (7)
- U-M Sustainability Initiatives (8)

Secondary

Sustainability Engagement
- U-M (3)
- General (4)

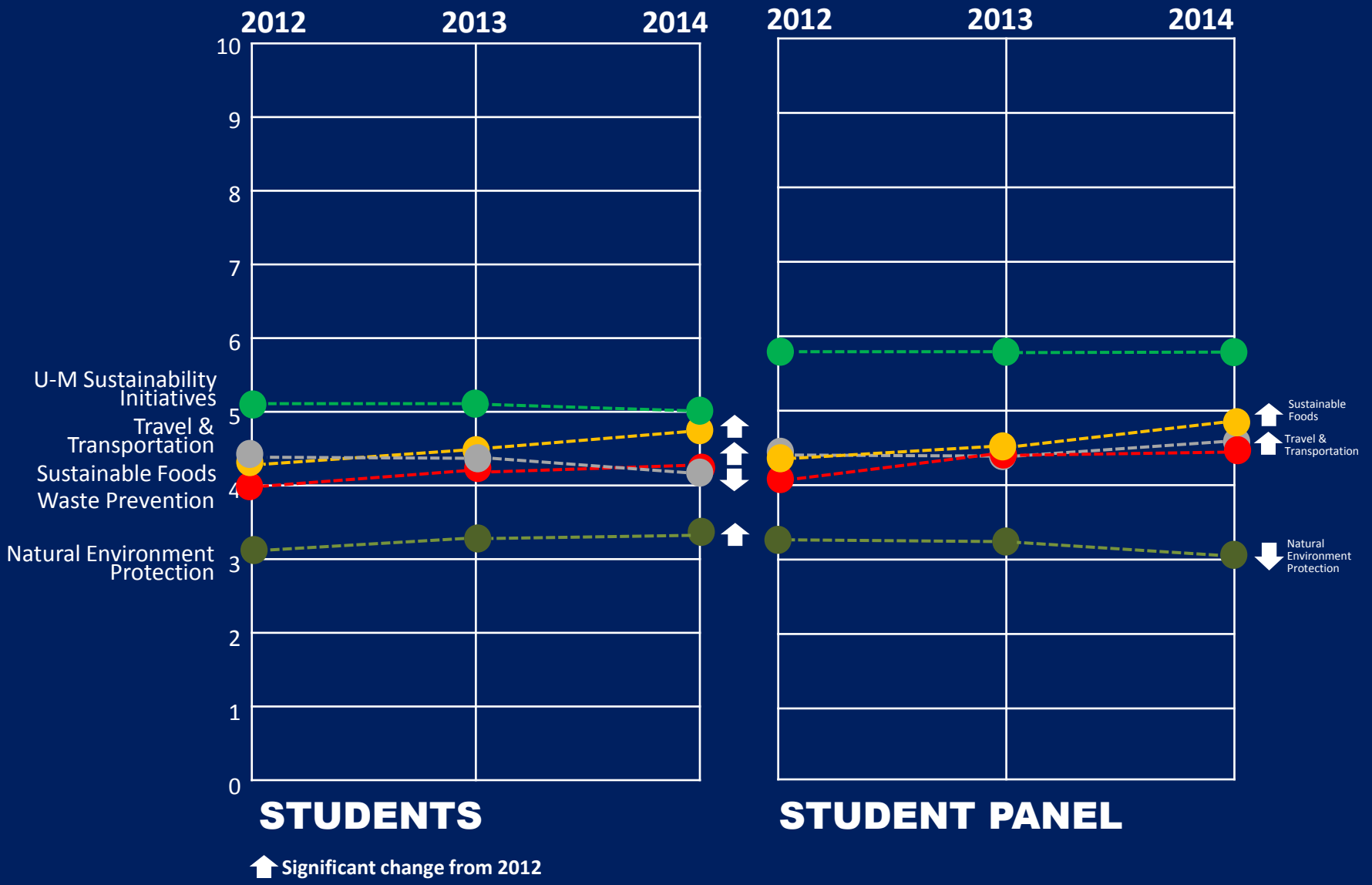
Sustainability Commitment (1)

Sustainability Disposition (3)

Evaluating U-M Sust. Initiatives (8)

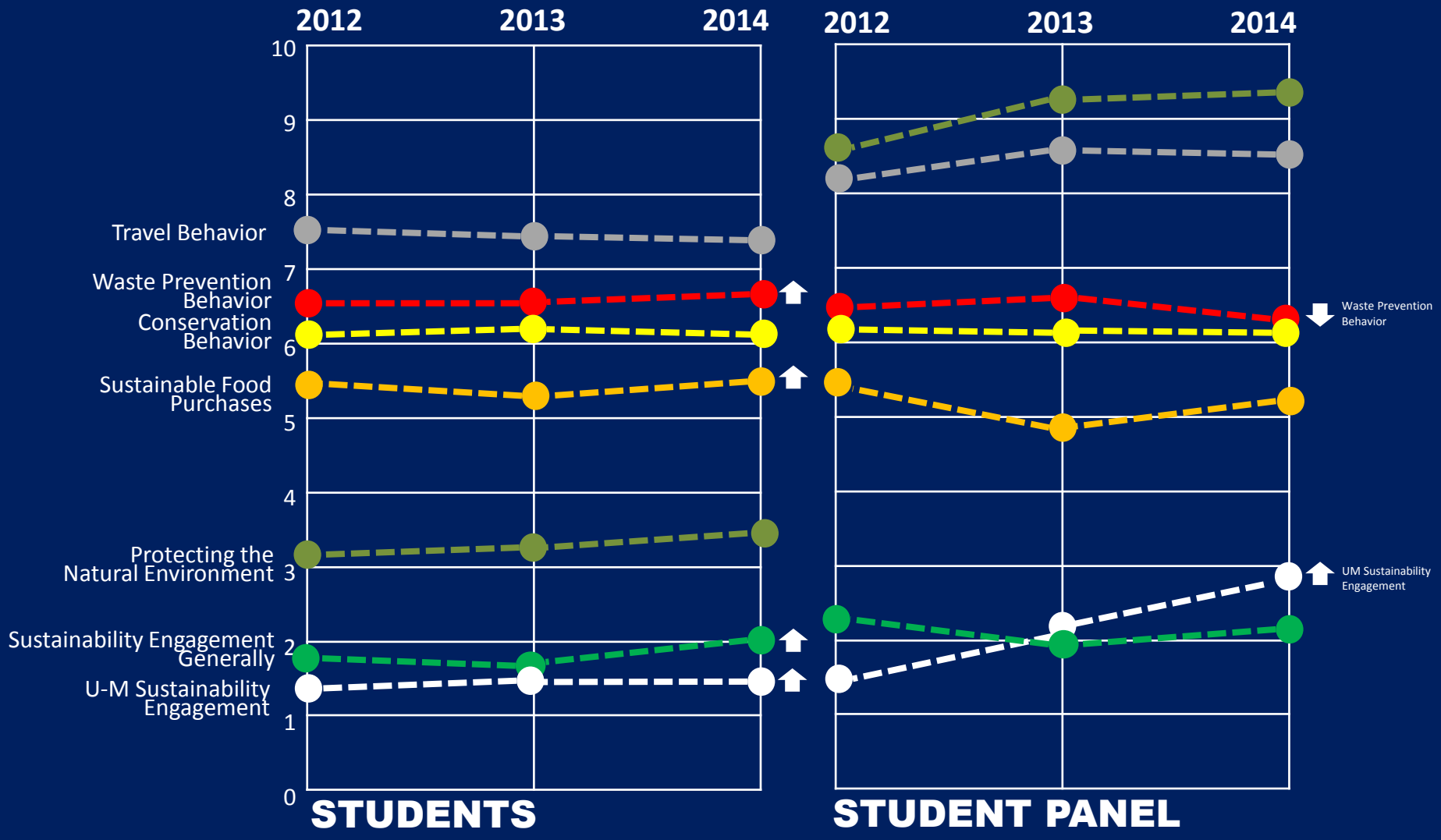
INDICATOR CHANGES – AWARENESS

AMONG STUDENTS



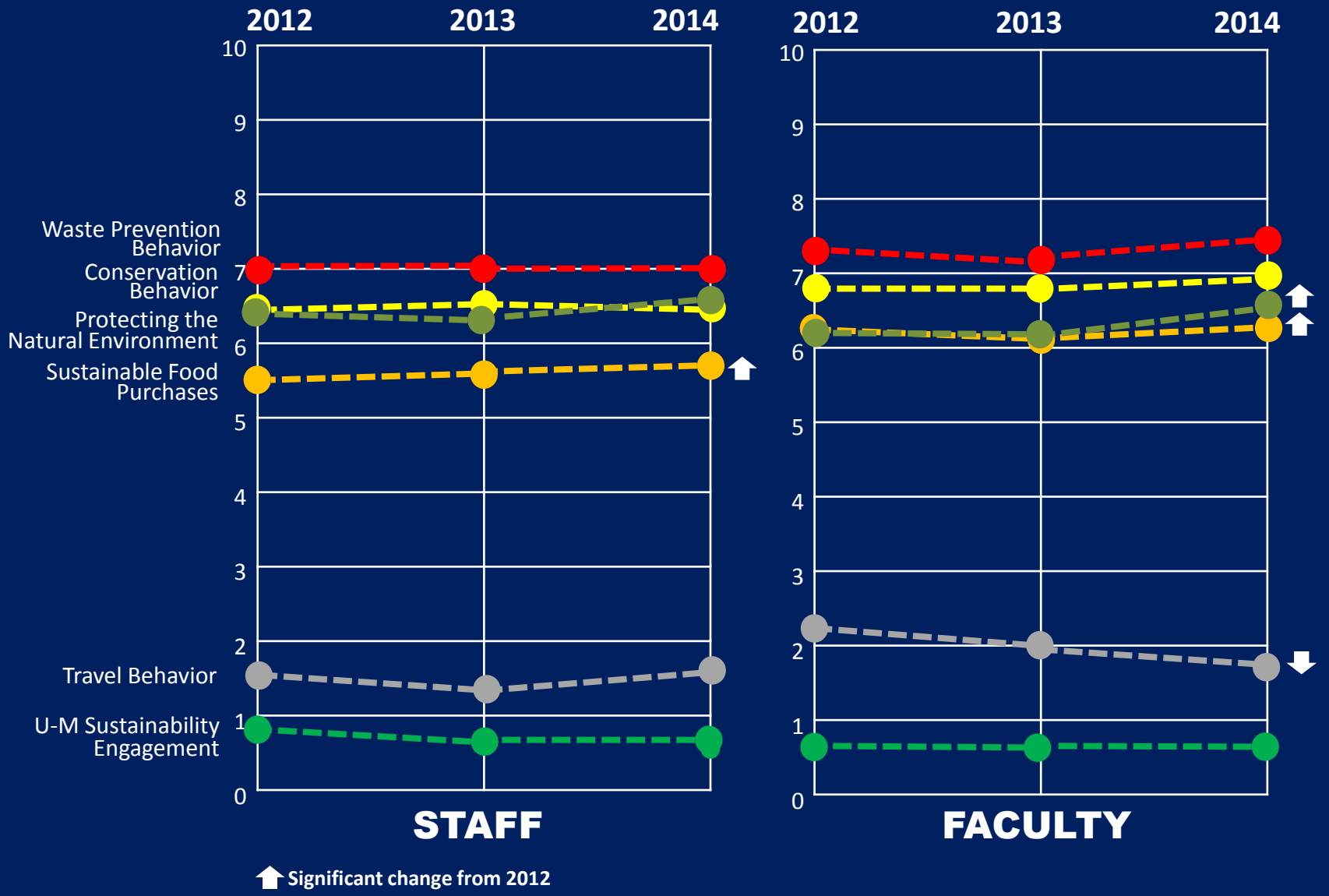
INDICATOR CHANGES – BEHAVIORAL

AMONG STUDENTS



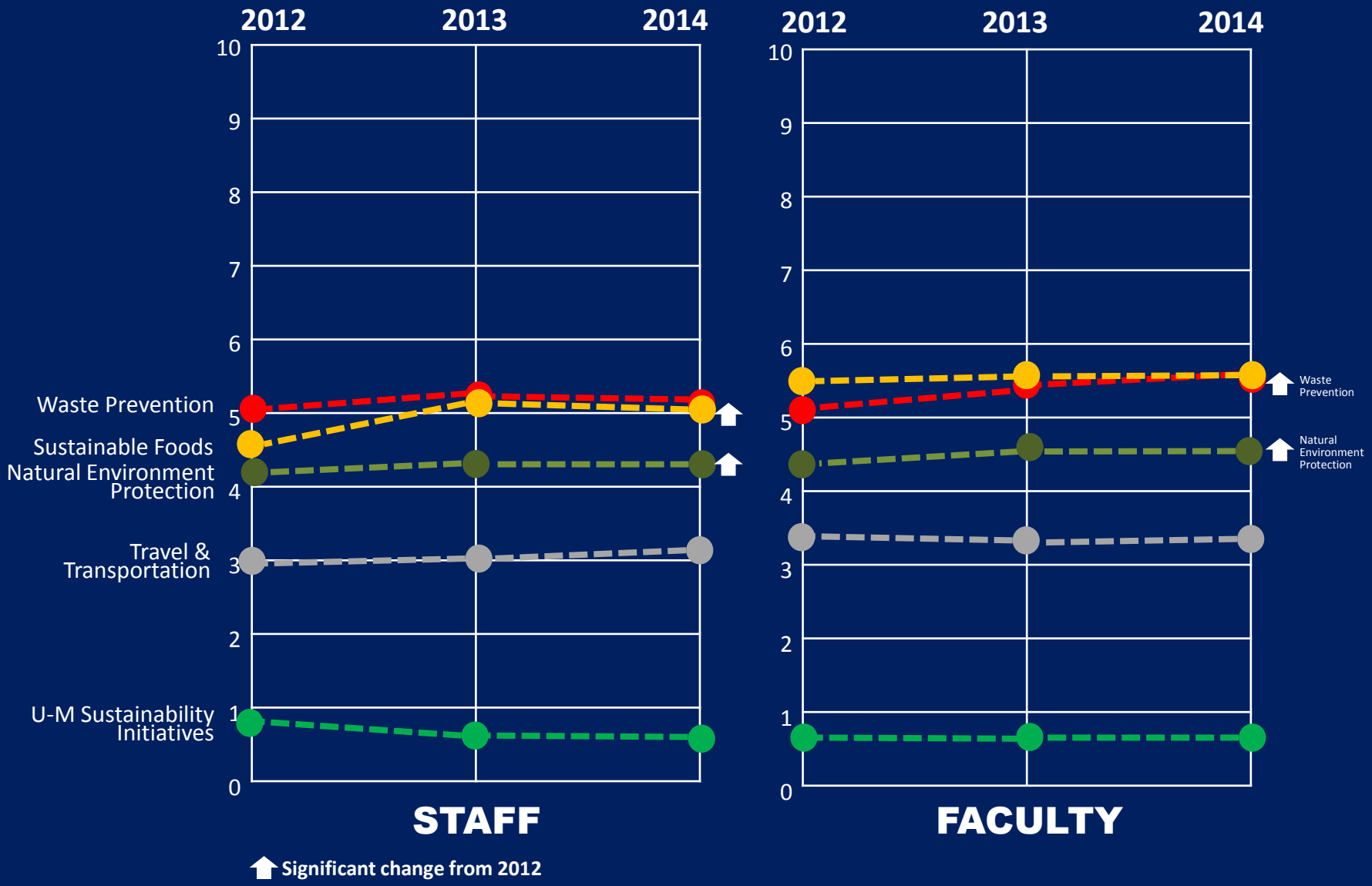
INDICATOR CHANGES – BEHAVIORAL

DIFFERENCES AMONG STAFF AND FACULTY

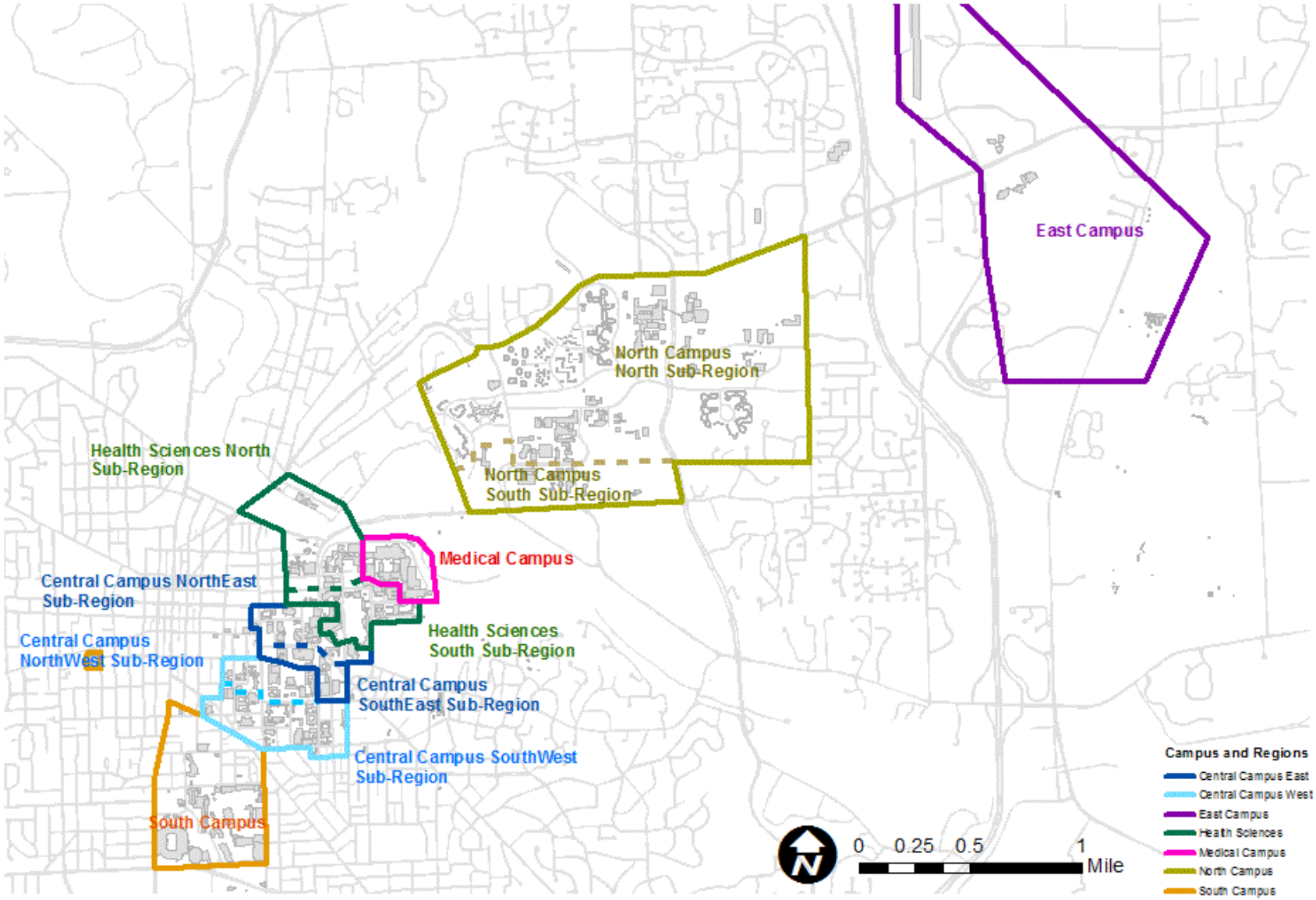


INDICATOR CHANGES – AWARENESS

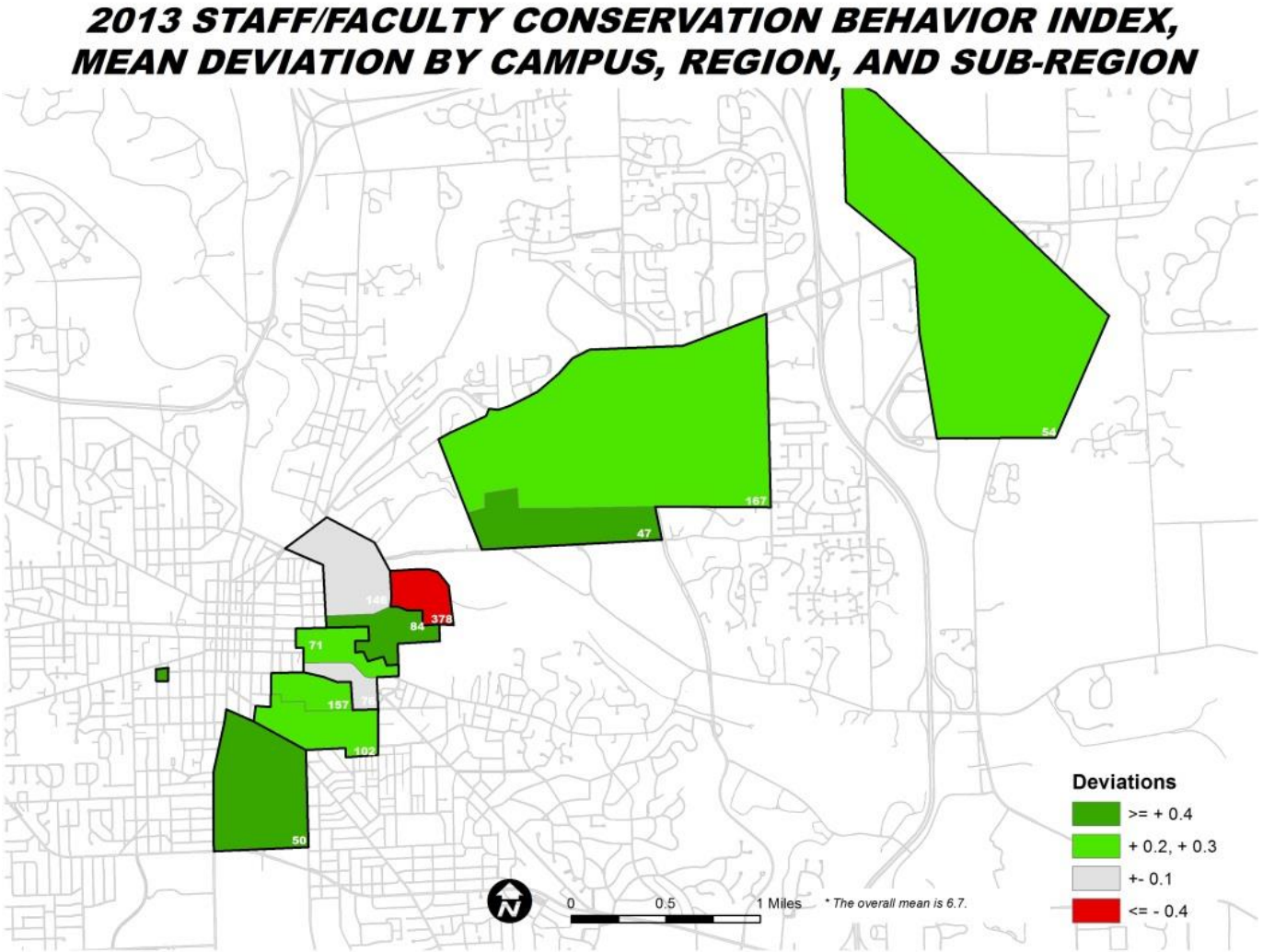
DIFFERENCES AMONG STAFF AND FACULTY



UNIVERSITY OF MICHIGAN CAMPUSES AND REGIONS

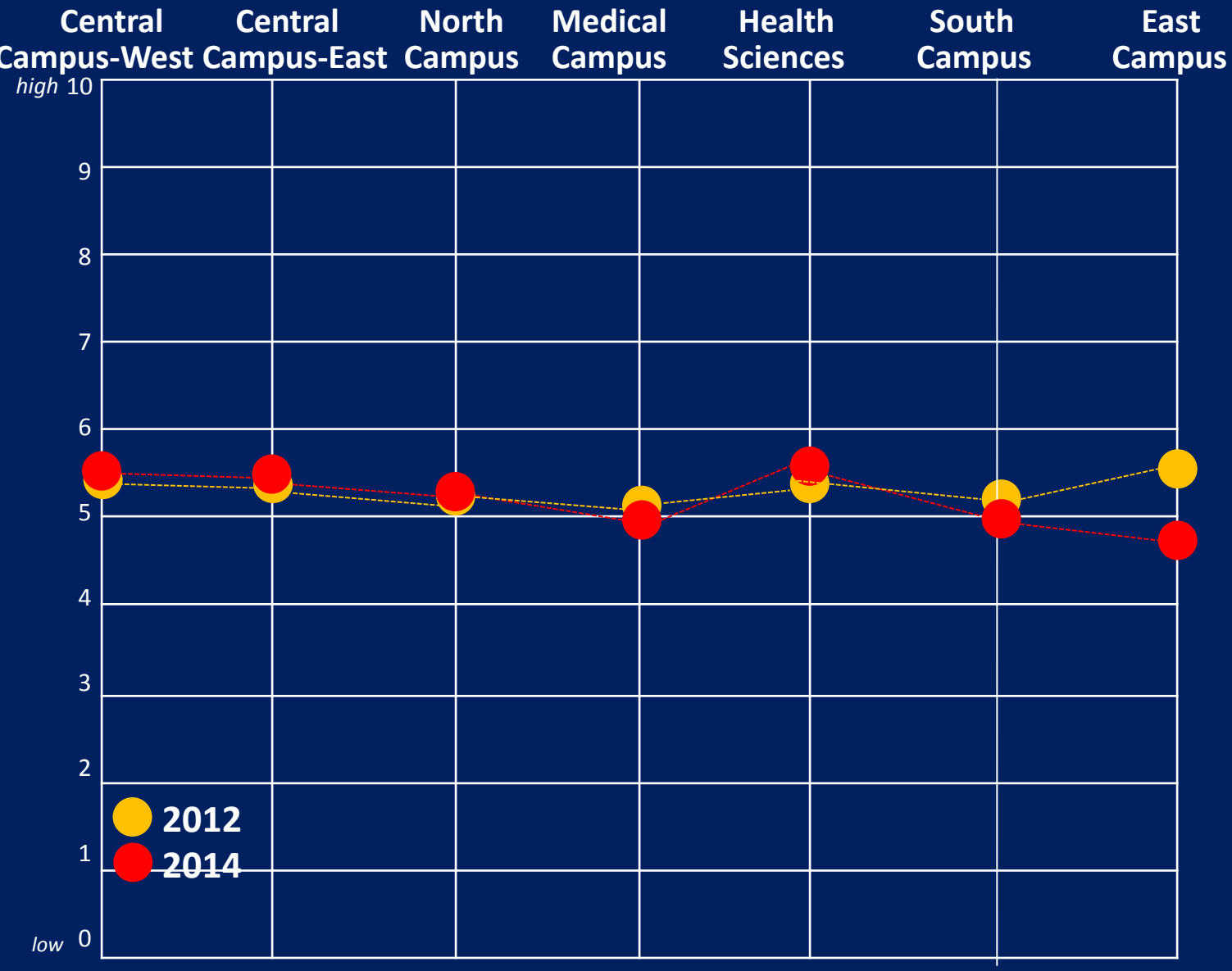


Spatial Analysis



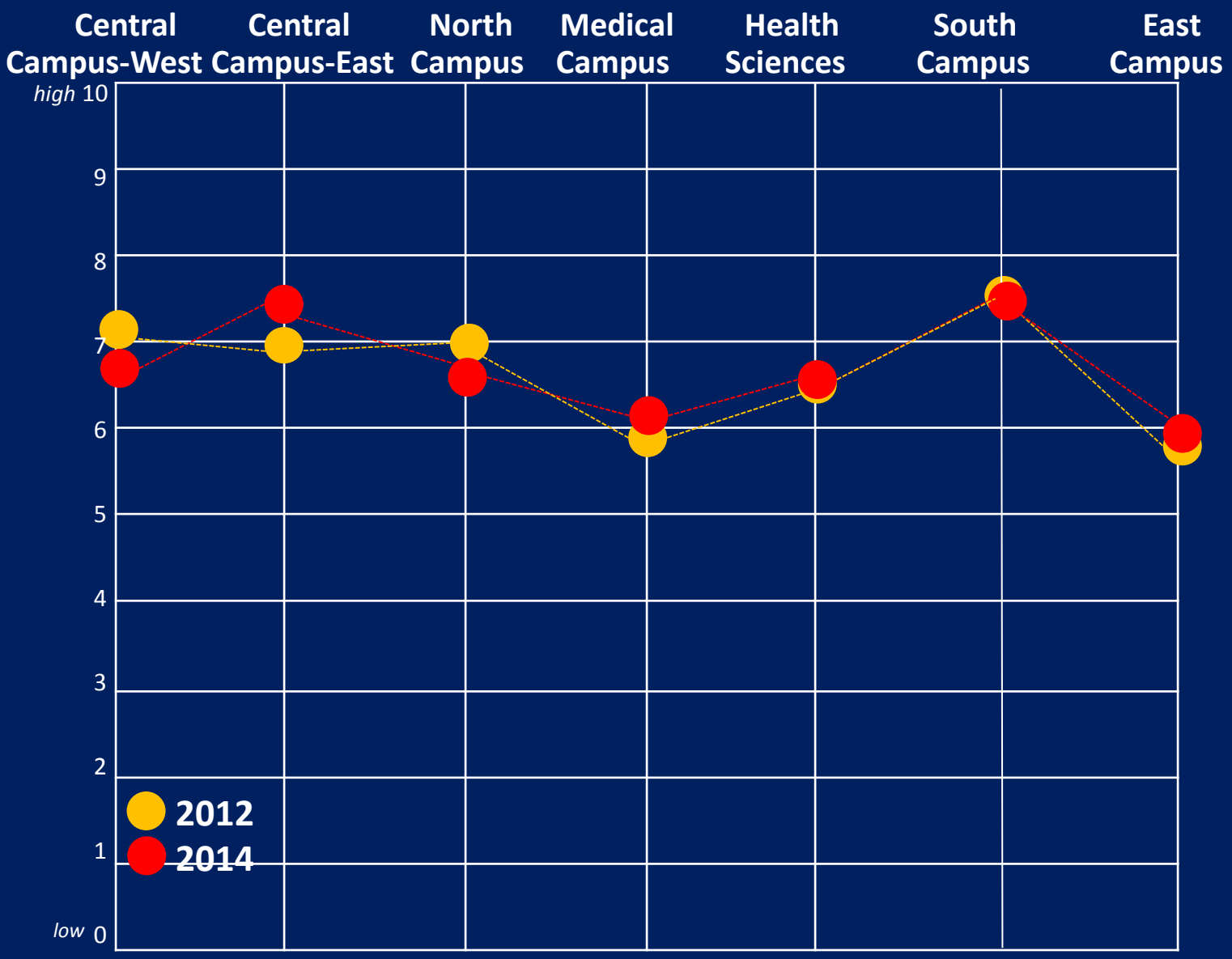
AWARENESS OF U-M SUSTAINABILITY INITIATIVES INDICATOR

DIFFERENCES AMONG STAFF-FACULTY – 2012 & 2014



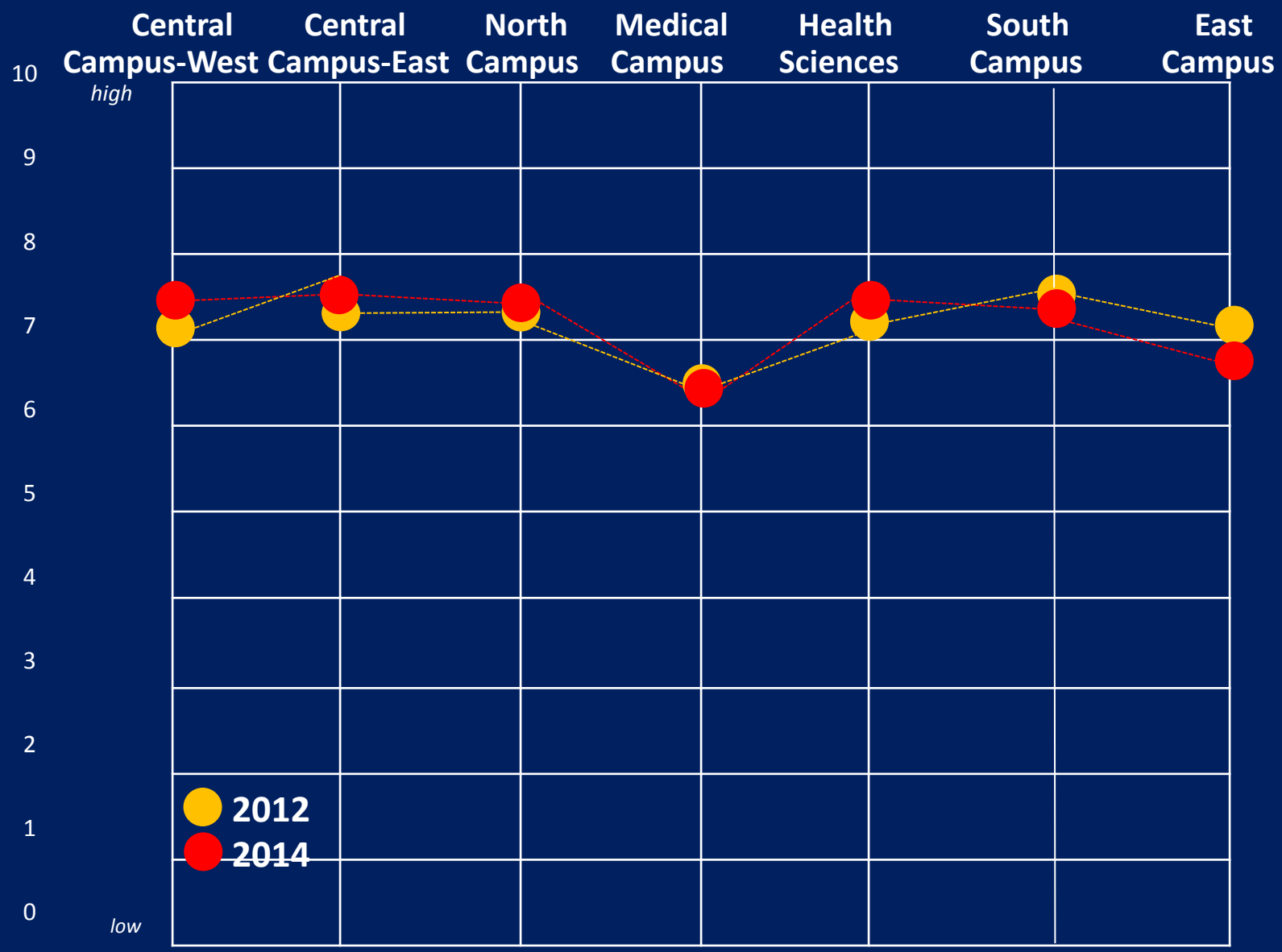
CONSERVATON BEHAVIOR INDICATOR

DIFFERENCES AMONG STAFF-FACULTY –2012 & 2014



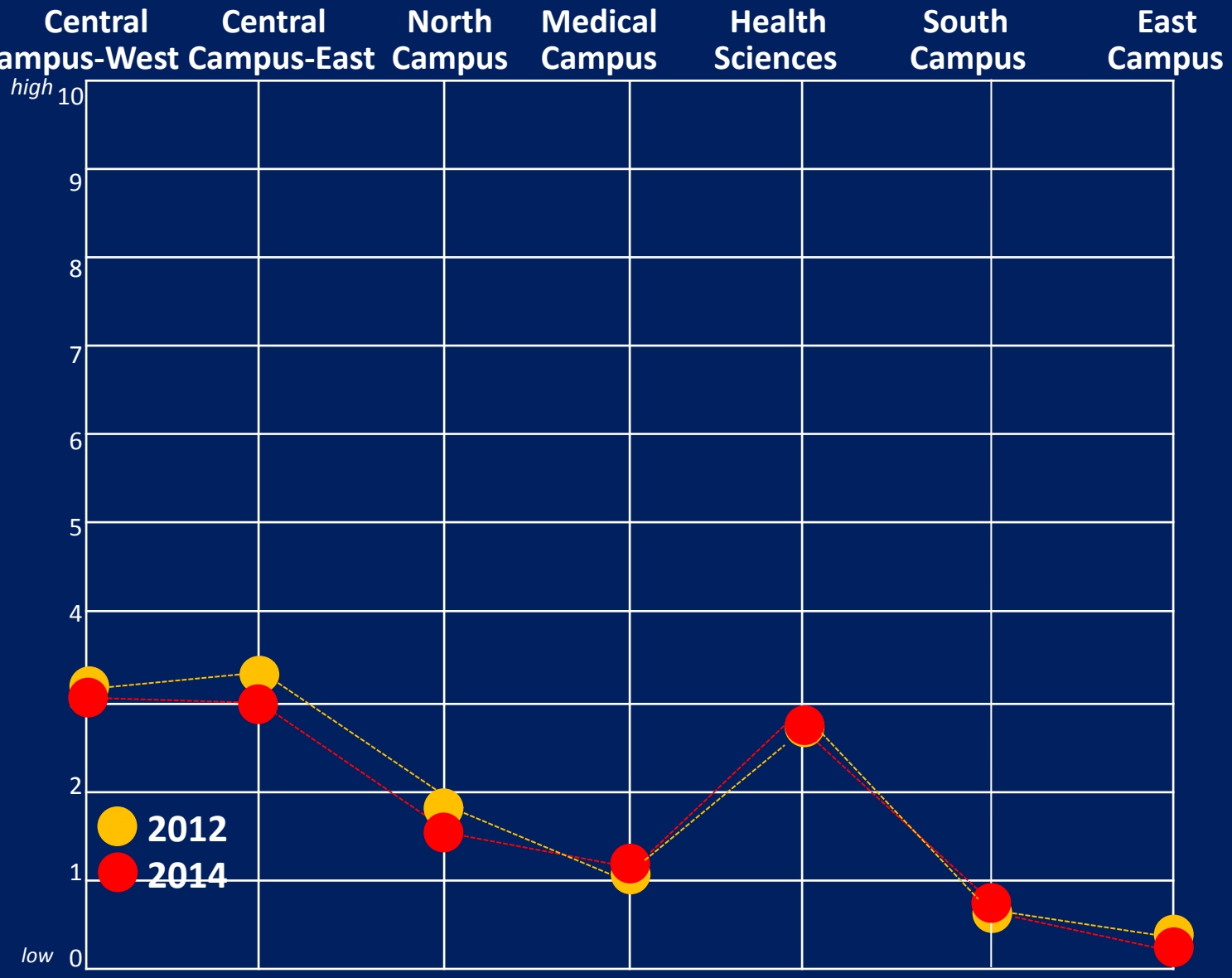
WASTE PREVENTION BEHAVIOR INDICATOR

DIFFERENCES AMONG STAFF-FACULTY –2012 & 2014

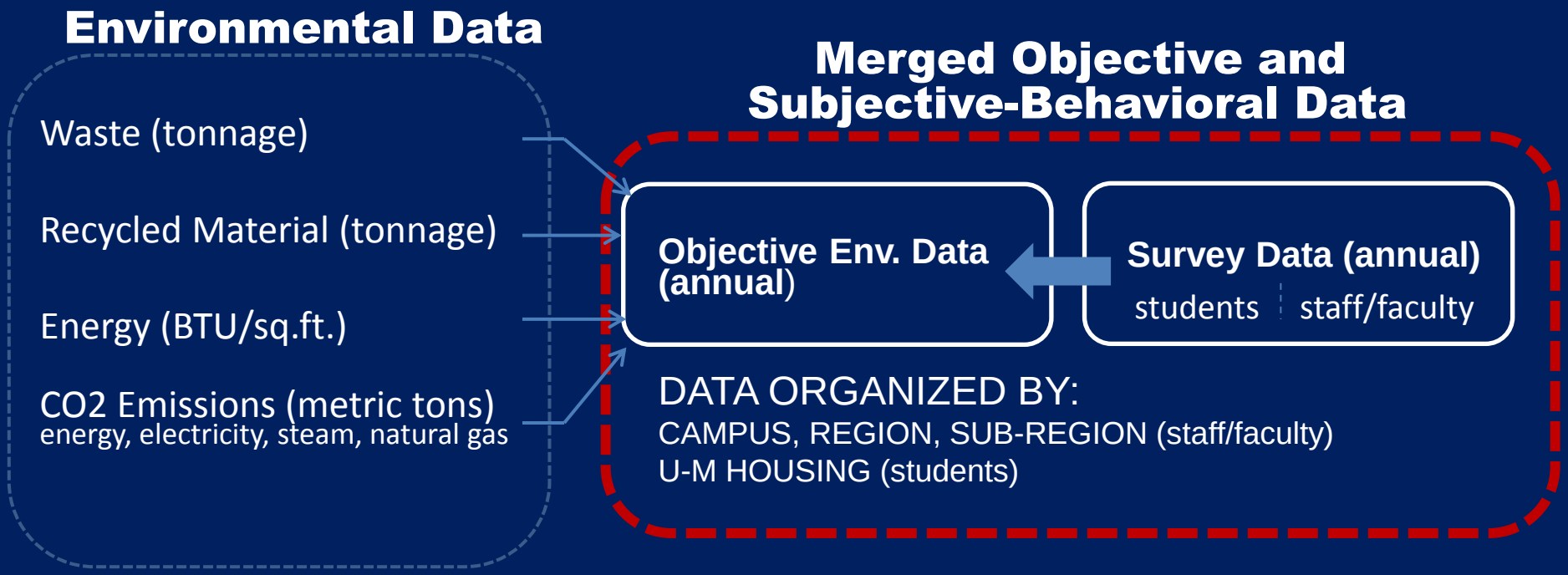


TRAVEL BEHAVIOR INDICATOR

DIFFERENCES AMONG STAFF-FACULTY –2012 & 2014



Analysis of Environmental Data and Survey Data



Pairing SCIP Survey Data and Environmental Data

Mar-15

PAIRING SCIP SURVEY DATA & ENVIRONMENTAL DATA (waste, recycling, BTU,CO2)

	2012	2013	2014	2015	2016	2017
SCIP SURVEY DATA	Fall 2012	Fall 2013	Fall 2014	Fall 2015	Fall 2016	Fall 2017
WASTE/RECYCLING DATA	Sept11-Aug12	Sept12-Aug13	Sept13-Aug14	Sept14-Aug15	Sept16-Aug16	Sept16-Aug17
BTU/CO2 DATA	FY12 (Jul11-Ju12)	FY13 (Jul12-Ju13)	FY14 (Jul13-Ju14)	FY15 (Jul14-Ju15)	FY16 (Jul15-Ju16)	FY17 (Jul16-Ju17)
Complete						

SAMPLE TABLE SHOWING

RELATIONSHIPS BETWEEN ENERGY USE, CO2 EMISSIONS & CONSERVATION BEHAVIOR AMONG FACULTY-STAFF, by CAMPUS & SUB-REGION

Working Table E1

CHANGE IN ENERGY USE, CO2 EMISSIONS & CONSERVATION BEHAVIOR AMONG FACULTY/STAFF, by CAMPUS & SUB-REGION: 2012-2014

Campus, Region, Sub-Region	BTU Per Square Foot				MTCO2 Per Square Foot				Change Consevation Behavior 2012-2014
	2012	2013	2014	Change 2012-2014	2012	2013	2014	Change 2012-2014	
Central Campus Northeast (18)	135,227	129,891	148,072	9.5%	0.0131	0.0127	0.0139	6.4%	2.9%
Central Campus-Southeast (7)	258,408	272,592	256,900	-0.6%	0.0250	0.0259	0.0248	-0.8%	6.9%
Central Campus-Nothwest (20)	166,397	165,956	162,655	-2.2%	0.0159	0.0158	0.0156	-1.8%	-4.2%
Central Campus-Southwest (22)	119,499	119,418	120,402	0.8%	0.0121	0.0120	0.0122	0.5%	-2.8%
Medical Campus (12)	208,582	192,313	206,551	-1.0%	0.0290	0.0270	0.0285	-1.7%	5.2%
Health Sciences-North (17)	327,107	327,523	301,739	-7.8%	0.0302	0.0302	0.0286	-5.4%	-3.0%
Health Sciences-South (20)	291,139	289,438	295,764	1.6%	0.0292	0.0290	0.0291	-0.1%	6.1%
NorthCampus-North (39)	226,713	254,290	266,928	17.7%	0.0265	0.0285	0.0277	4.6%	-4.2%
NorthCampus-South (10)	188,775	198,204	209,583	11.0%	0.0223	0.0231	0.0238	6.4%	-5.7%
South Campus (30)	135,721	146,134	159,949	17.9%	0.0146	0.0152	0.0162	11.2%	-2.6%
East Campus (5)	136,347	146,638	160,495	17.7%	0.0333	0.0297	0.0231	-30.7%	-10.4%

SAMPLE TABLE SHOWING

RELATIONSHIPS BETWEEN ENERGY USE, CO2 EMISSIONS & CONSERVATION BEHAVIOR AMONG STUDENTS IN U-M HOUSING

Working TableXX

CHANGE IN ENERGY USE, CO2 EMISSIONS & CONSERVATION BEHAVIOR AMONG STUDENTS IN U-M HOUSING by PLACE OF RESIDENCE : 2012-2014

U-M Housing[a]	BTU Per Square Foot				Metric Tons CO2 Per Square Feet				Change in Conservation Behavior 2012-2014
	2012	2013	2014	Change(%) 2012-2014	2012	2013	2014	Change(%) 2012-2014	
North Quad	71,363	74,235	81,757	15%	0.0081	0.0068	0.0073	-9%	-1.5%
West Quad*	69,043	33,561	91,869	33%	0.0065	0.0028	0.0094	44%	**
South Quad*	64,238	92,957	102,454	59%	0.0064	0.0079	0.0085	33%	-1.6%
East Quad*	71,078	33,376	34,063	-52%	0.0065	0.0049	0.0052	-21%	**
Stockwell	69,559	202,095	212,627	206%	0.0071	0.0208	0.0213	199%	-1.6%
Mosher-Jordan	170,445	40,028	37,181	-78%	0.0182	0.0041	0.0038	-79%	-6.3%
Mary Markley	99,301	75,407	58,879	-41%	0.0093	0.0073	0.0046	-50%	-1.7%
Alice Lloyd***	22,884	76,168	85,011	12%	0.0016	0.0075	0.0081	7%	3.3%
Couzens	83,101	77,810	77,942	-6%	0.0085	0.0072	0.0072	-15%	-3.3%
Bursley-Baits	114,805	72,495	72,286	-37%	0.0098	0.0080	0.0079	-20%	0.0%
Northwood Apartments	82,021	82,962	89,469	9%	0.0064	0.0064	0.0067	6%	-3.2%

[a]Data are excluded for the smaller residence halls having small number of respondents. These include: Bestsy Barbour, Martha Cook, Fletcher, Hende

[b]Data on energy use on CO2 emissions reflect the previous fiscal year. For example the 2012 data cover FY12v(July 2011 to June 2012.

*In 2005, U-M launched a long-term program of selective upgrades and complete renovations to its housing stock. In 2012, East Quad was closed for renovations followed by the closure of South Quad in 2013 and the West Quad closure in 2014. Figures for energy consumption and carbon emissions during renovation do not reflect the normal occupancy use.

**During renovations, residence halls were unoccupied. Therefore, East Quad students could not be selected in the 2012 SCIP sample while the 2014 SCIP sample had no West Quad participants. Consequently, survey data covering both 2012 and 2014 were not available to measure change scores for students in these residence halls.

*** 2012 data covering energy use and CO2 emissions for Alice Lloyd are low since the building was being renovated and therefore unoccupied during the previous year. Change for this building is based on the diffrence between 2014 and 2013

SAMPLE TABLE SHOWING

RELATIONSHIPS BETWEEN RECYCLING, WASTE & WASTE PREVENTION BEHAVIOR AMONG STUDENTS IN U-M HOUSING

Working TableXX

CHANGE IN RECYCLING,WASTE & WASTE PREVENTION BHAVIOR AMONG STUDENTS IN U-M HOUSING by PLACE OF RESIDENCE : 2012-2014

U-M Housing[a]	Recycling Tonnage per Square Feet[b]				Waste Tonnage Per Square Feet[b]				Change in Waste Prevention Behavior 2012-2014
	2012	2013	2014	Change 2012-2014	2012	2013	2014	Change 2012-2014	
North Quad	0.24	0.27	0.27	13%	0.51	0.46	0.49	-5%	-3.1%
West Quad*	0.43	0.40	0.35	-18%	1.14	1.07	0.86	-24%	**
South Quad*	0.45	0.44	0.02	-96%	0.68	0.57	0.02	-97%	6.2%
East Quad*	0.29	0.03	0.54	85%	0.83	0.01	0.66	-21%	**
Stockwell	0.20	0.20	0.20	0%	0.94	0.82	0.56	-40%	6.2%
Mosher-Jordan	0.71	0.83	0.86	21%	1.40	1.32	1.30	-7%	3.1%
Mary Markley	0.53	0.53	0.53	1%	1.09	1.12	1.04	-4%	3.1%
Alice Lloyd***	0.04	0.24	0.25	4%	0.03	0.42	0.63	49%	0.0%
Couzens	0.18	0.21	0.19	6%	0.29	0.28	0.24	-18%	7.8%
Bursley-Baits	0.37	0.35	0.38	3%	0.71	0.66	0.52	-28%	6.6%
Northwood Apartments	0.23	0.25	0.26	11%	0.53	0.50	0.52	-3%	1.5%

[a]Data are excluded for the smaller residence halls having small number of respondents. These include: Bestsy Barbour, Martha Cook, Fletcher, Henderson, Newberry, and Oxford.

[b]Data are based on tonnage collected from dumpsters associated with each building for the proceeding 12 months. For example the 2012 data cover the period from September 2011 to August 2012.

*In 2005, U-M launched a long-term program of selective upgrades and complete renovations to its housing stock. In 2012, East Quad was closed for renovations followed by the closure of South Quad in 2013 and the West Quad closure in 2014. Figures for recycling and waste during renovation do not reflect the normal occupancy use.

**During renovations, residence halls were unoccupied. Therefore, East Quad students could not be selected in the 2012 SCIP sample while the 2014 SCIP sample had no West Quad participants. Consequently, survey data covering both 2012 and 2014 were not available to measure change scores for students in these residence halls.

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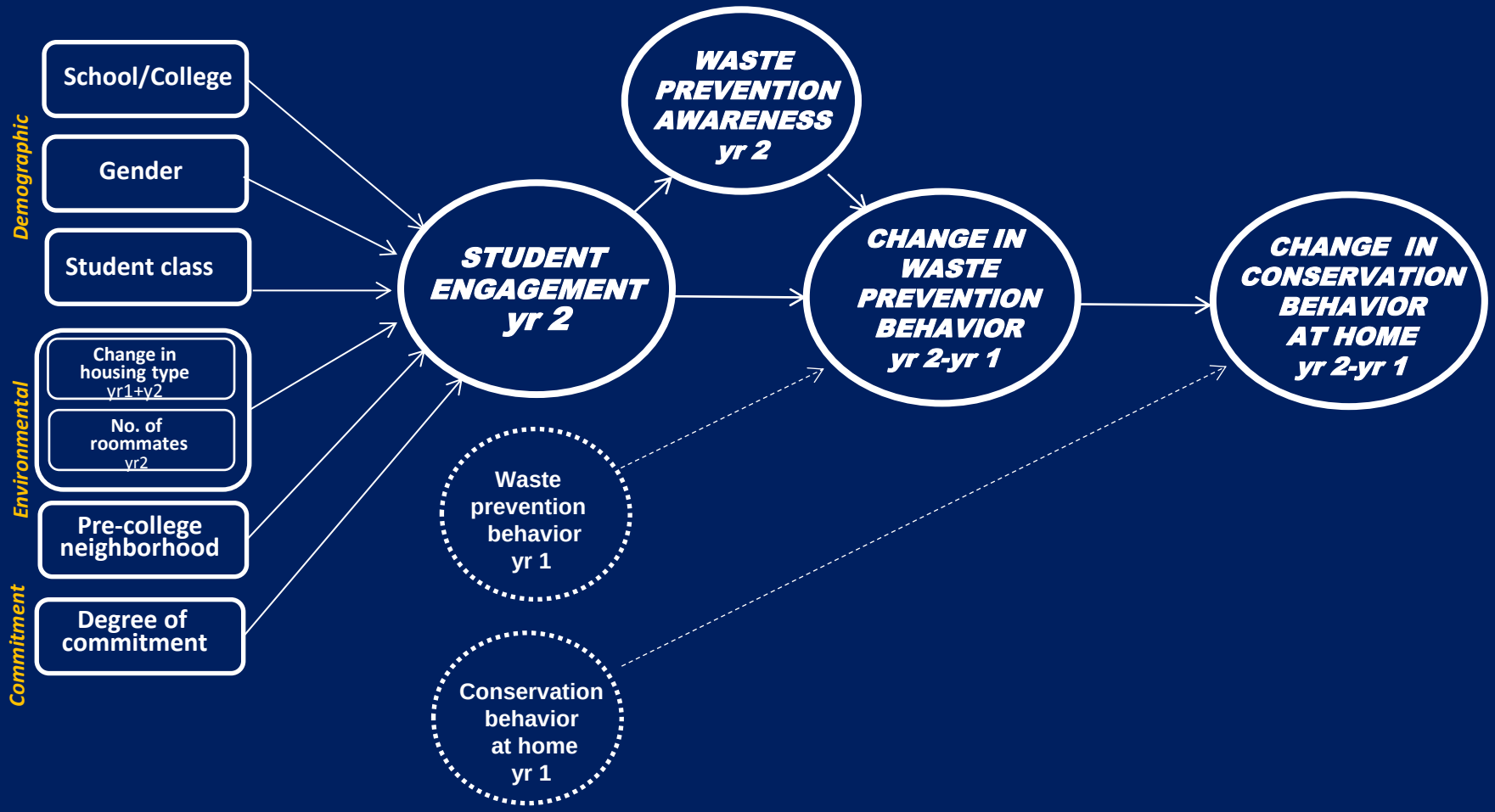
Panel Analysis

Conceptual Model – Hypotheses



Measurement

ENGAGEMENT – 1.taking a class, 2. being a member of a campus environmental/sustainability organization, 3. participating in a Planet Blue Ambassadors Program, 4. participated in a singular sustainability event **[Sum count of these 4 types of engagement]**

Demographic

1) Year in school

2) Gender

3) Degree program - *social sciences (reference group), humanities, natural sciences, engineering, other

Environmental

4) Housing - Change in housing type from YR1 to YR2

*** Residence hall to Residence hall (reference group)**
Residence Hall to Off-campus house/apartment
Off-campus house/apt to off-campus house/apt
University apartments
Other

5) Housing -Number of roommates in YR2

6) Pre-College Neighborhood – the type of neighborhood where student lived during his HS years.

Commitment

7) Commitment –"Overall, how committed are you to sustainability? Are you: Very Committed, Somewhat committed, Not very committed, Not at all committed."

Measurement *(cont'd)*

Behaviors

WASTE PREVENTION BEHAVIOR – INDICATOR

"During the past year, how often did you do the following, when you had the opportunity? Never, Rarely, Sometimes, Always/Most of the time?"

- Print double-sided
- Recycle bottles, containers, and paper products
- Use a reusable water
- Use U-M Property Disposition Services to obtain items such as computers, furniture, etc.

CONSERVATION BEHAVIOR AT HOME – INDICATOR

"During the past year, how often did you do the following, when you had the opportunity? Never, Rarely, Sometimes, Always/Most of the time?

- Turn off lights when I leave the room
- Use power savings settings on my computer
- Turn off computer when not using it.
- Use a motion sensor/"smart" power strip

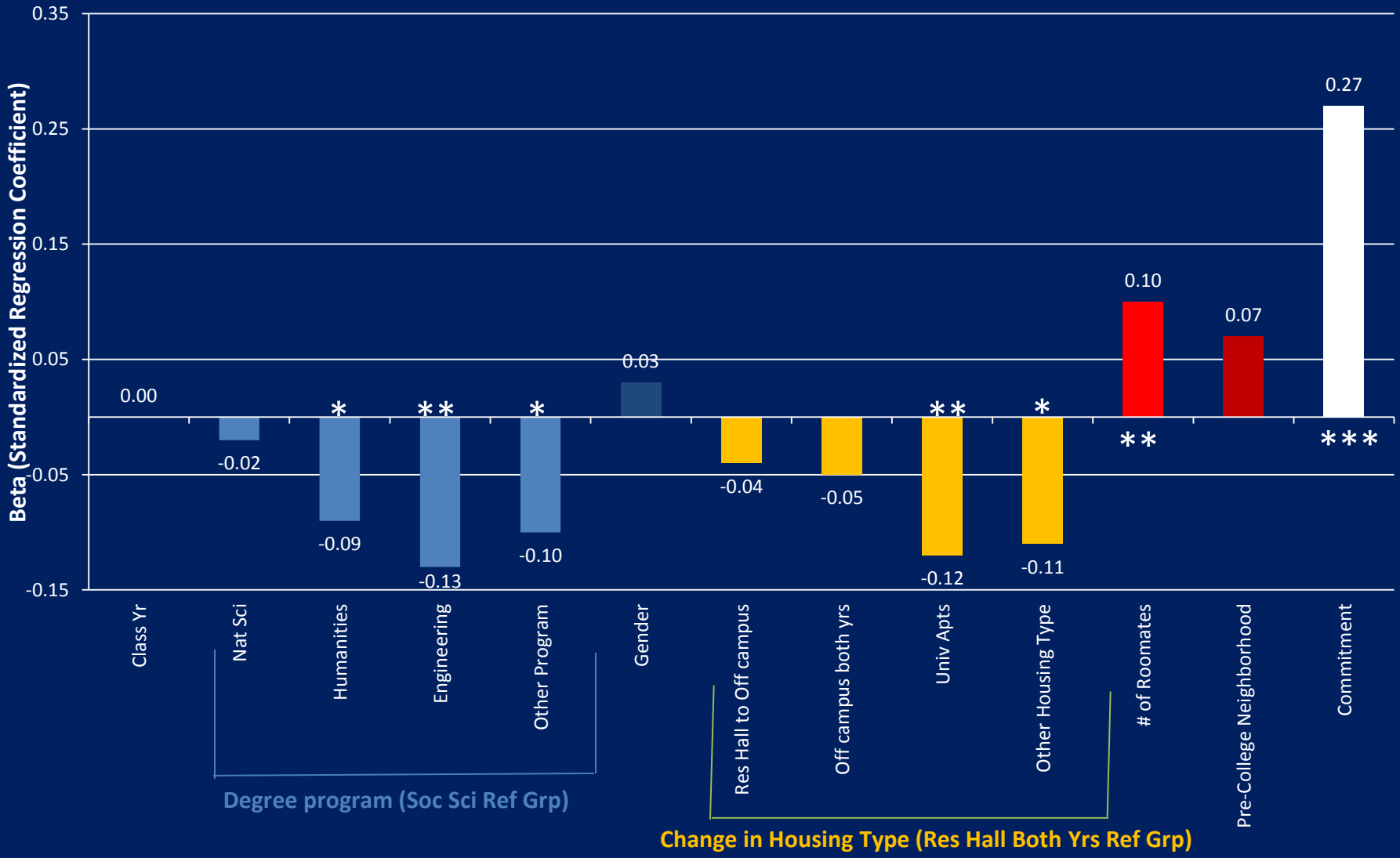
Awareness

WASTE PREVENTION AWARENESS - INDICATOR

"How much do you know about the following at U-M? A lot, A fair amount, A little, Not much/nothing"

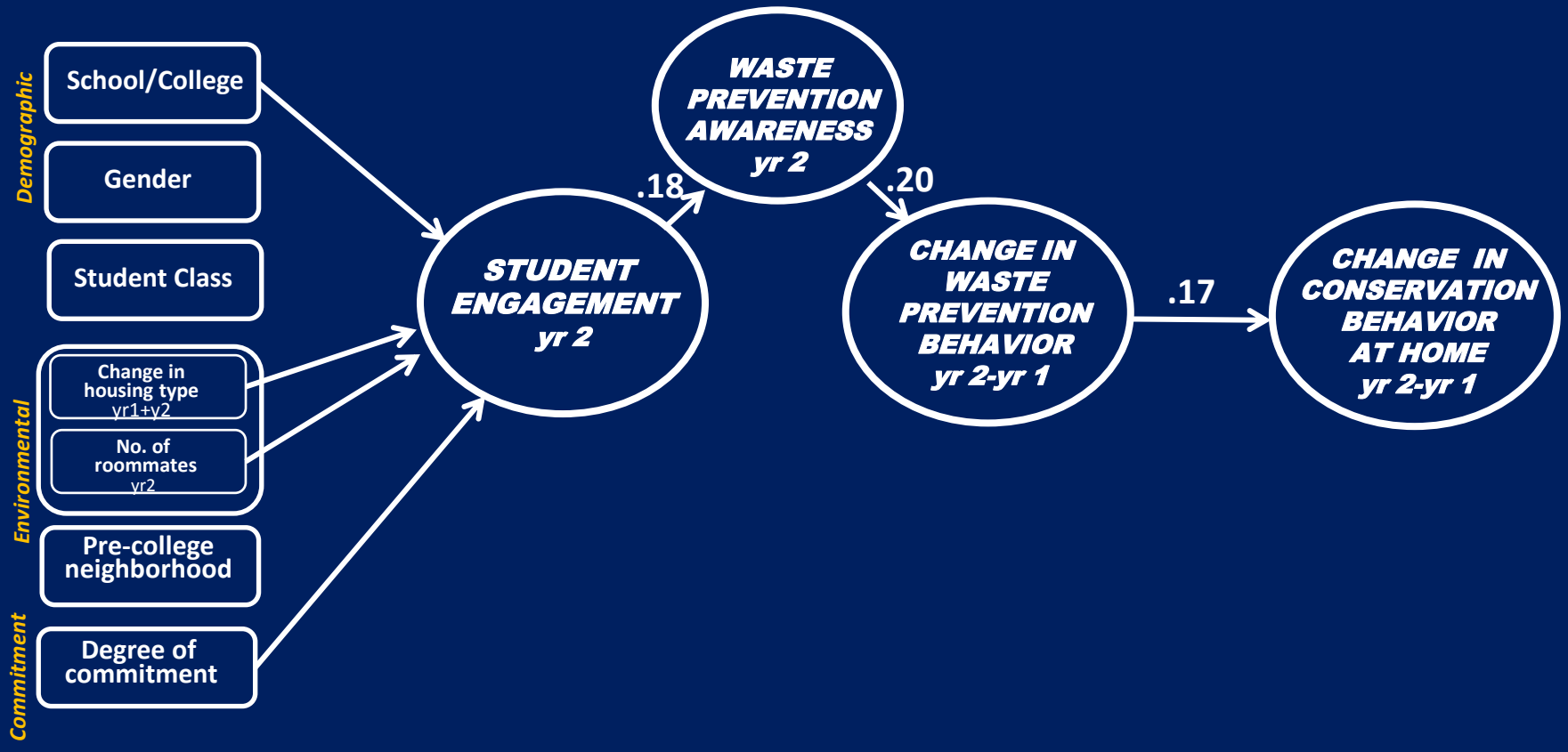
- Recycling glass
- Recycling plastic
- Recycling paper
- Recycling electrical waste
- Property disposition services

Findings: Predictors of Engagement



*p<.05; **p<.01; ***p<.001

Relationships Found



Current Status

- Data Cleaning and Preliminary Analysis of YR 4 Data (2015)
- On-going Analysis of Panel Data
- Working with Operational Units – hospitals, student life, plant operations
- Dissemination and Replication Elsewhere

Questions / Discussion

Thank You

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