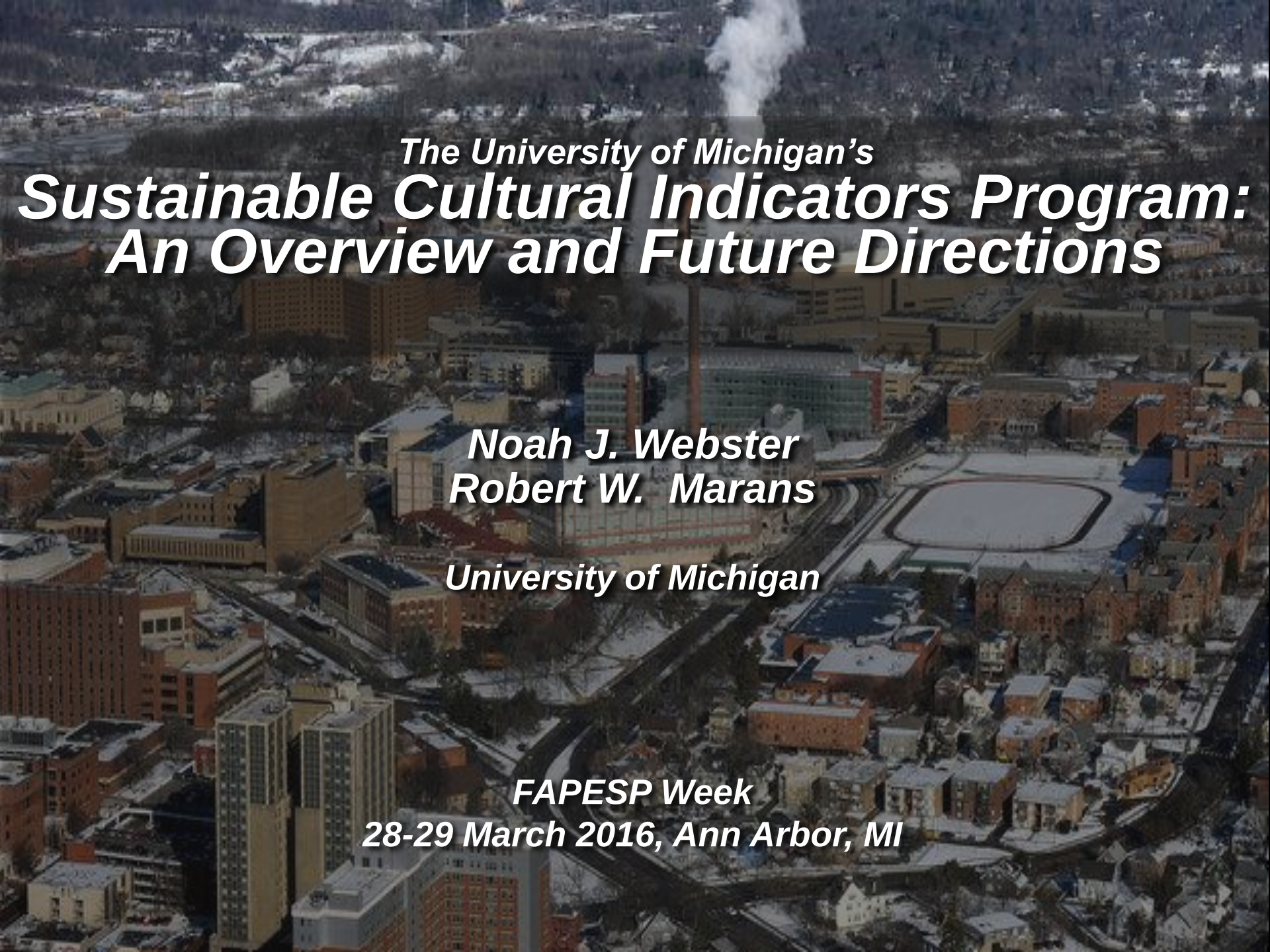

The University of Michigan's

Sustainable Cultural Indicators Program: An Overview and Future Directions

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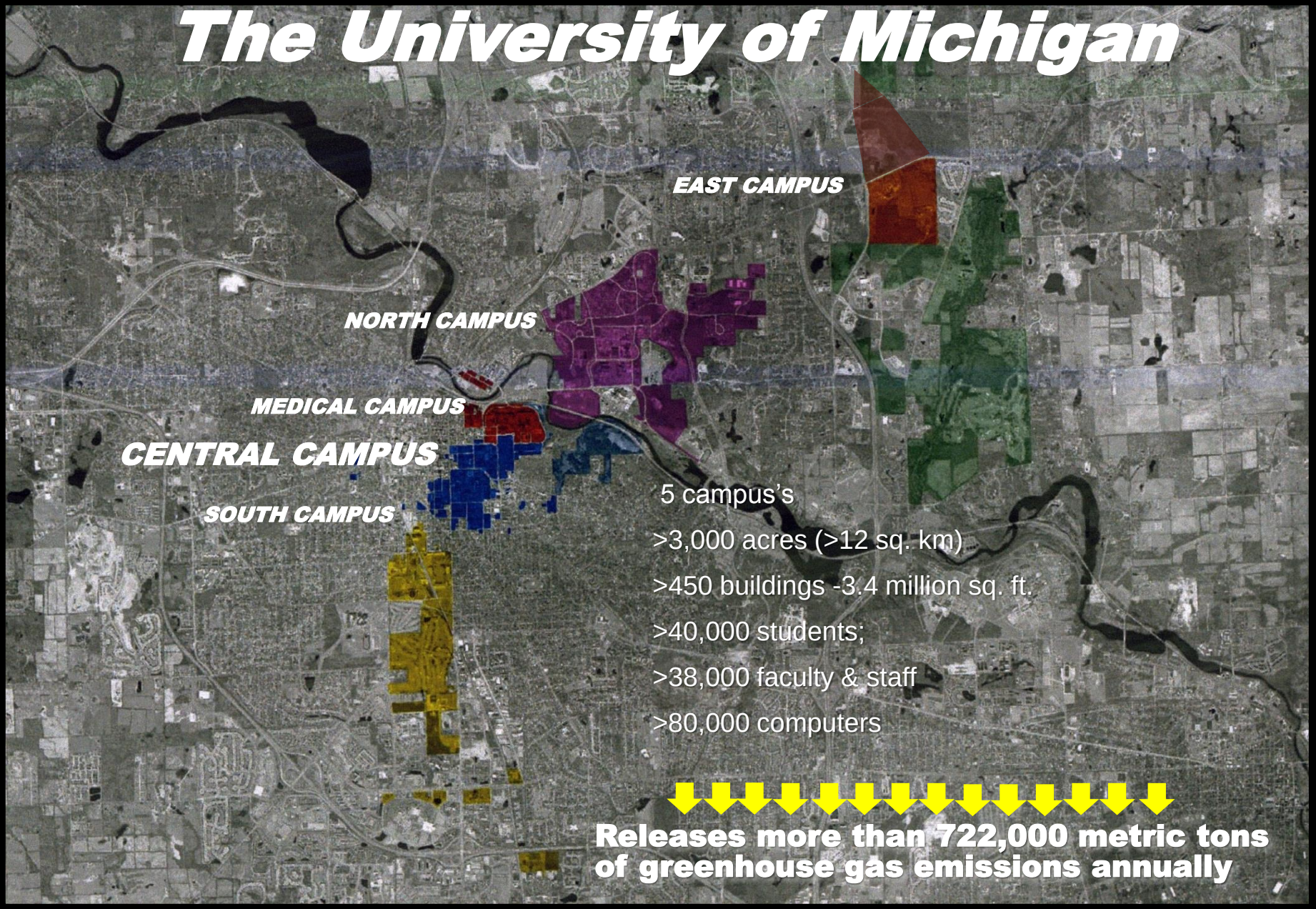
Overview

- Background and Campus Context
- A Model for Measuring Cultural Change
- Sustainability Cultural Indicators Program (SCIP)
- Research Design & Process
- Some Findings
- Current Status
- Future Directions

Ann Arbor and The University of Michigan



5 campus's

>3,000 acres (>12 sq. km)

>450 buildings -3.4 million sq. ft.

>40,000 students;

>38,000 faculty & staff

>80,000 computers

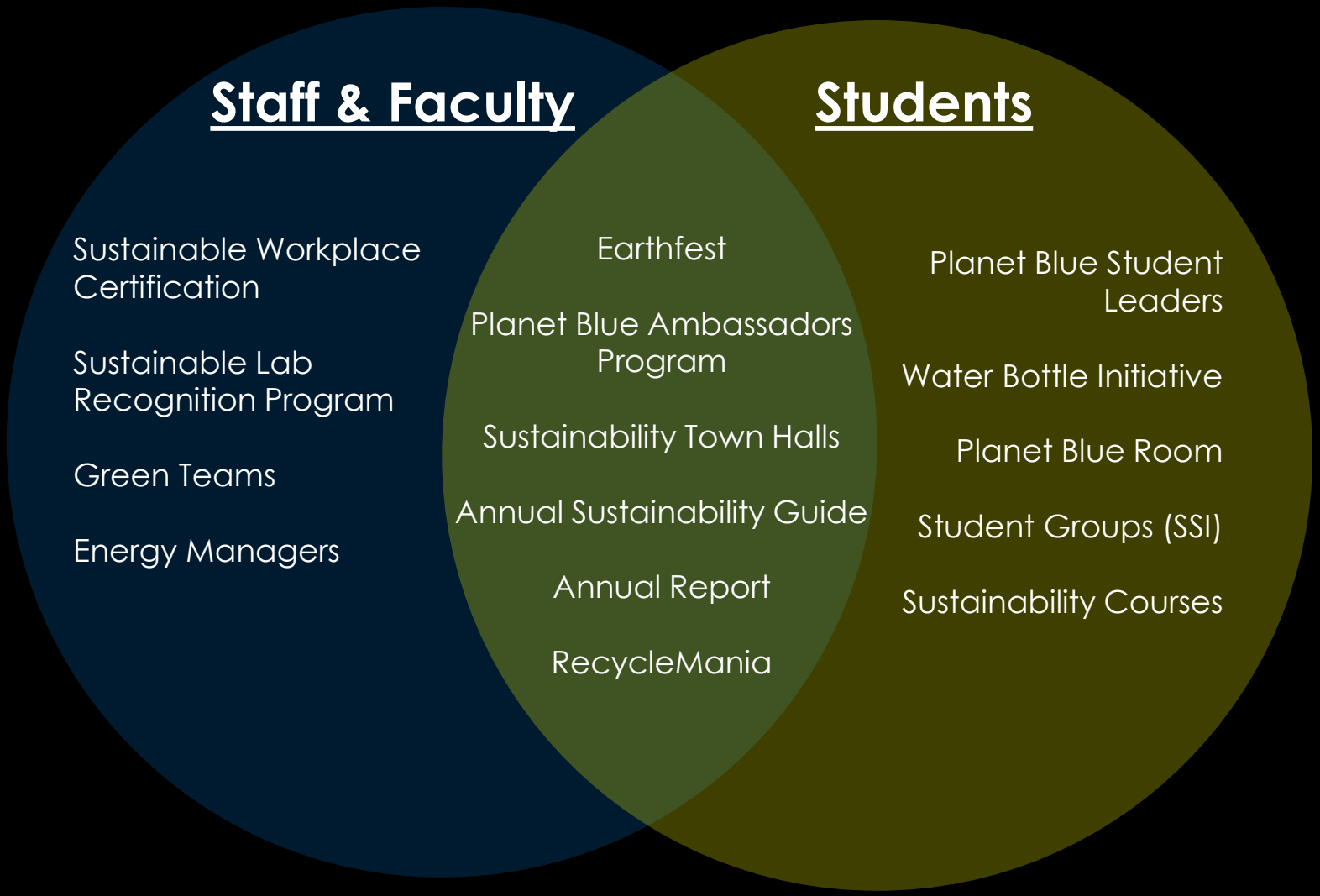
Releases more than 722,000 metric tons of greenhouse gas emissions annually

Integrated Assessment Themes

THEME	GUIDING PRINCIPLE	2025 GOALS
Climate Action	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	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	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	**Pursue stakeholder engagement, education, and *evaluation strategies* toward a campus-wide ethic/culture of sustainability.**	**The report recommends investments in multiple actions to educate our community, *track behavior, and report progress over time*.**

A Model for Measuring Cultural Change

Toward a Culture of Sustainability: Engagement & Education



Toward a Culture of Sustainability: Measuring, Monitoring, Evaluating

What is Culture of Sustainability?

"…….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"

How do we measure, monitor, and evaluate it?

…through a program called ***SCIP****…*

Sustainability Cultural Indicators Program

a multi-year U-M program of research designed to measure and track the culture of sustainability on campus so as to inform /guide university operations and policies

Culture Indicators
Conceptual Framework

INDIVIDUAL INDICATORS
survey based

	STUDENTS	FACULTY	STAFF	ALUMNI
	general travel building food recycling purchasing land/water	general travel building food recycling purchasing land/water	general travel building food recycling purchasing land/water	general travel building food recycling purchasing land/water
awareness/ knowledge				
behaviors				
engagement/ commitment				
other(research)	barriers; willingness to; likelihood (chances of….) rating of others-social norms; values, etc.			

OBJECTIVE INDICATORS
non-survey based

general	travel	building	food	recycling	purchasing	land/water

Sustainability Cultural Indicators Program - SCIP

What do we measure? How do we measure ? How do we know if its changing?

Knowledge, Awareness
Behaviors, Actions
Commitments
Values, Dispositions

general

U-M specific

Travel & Transportation

Waste Reduction & Conservation

Natural Environment

Sustainable Foods

Climate Change

U-M Goals
2025

CLIMATE ACTION **reduce GHG emissions by 25%; decrease GHG/passenger trip for UM trans. options by 30%**

WASTE PREVENTION **reduce waste tonnage to disposal facilities by 40%**

HEALTHY ENVIRONMENTS
protect Huron River water quality by reducing volume of chemicals used in land management by 40%; purchase 20% of U-M food from sustainable sources.

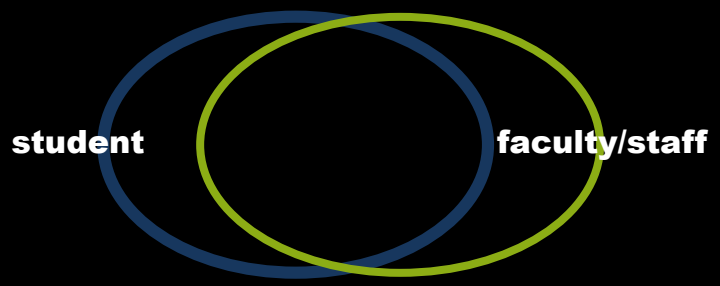
COMMUNITY AWARENESS
educational programs; monitoring/evaluating progress; reporting

Research Design

WEB SURVEYS– annually

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

Undergraduate student panel (800)



SUPPLEMENTAL DATA (OBJECTIVE INDICATORS) **-**annually

Building Information covering:
- Energy Use (BTU/sq ft)
- CO_2 emissions metric tons per sq ft
- Recycling material (lbs per sq ft)
- Waste sent to disposal facilities (lbs per sq ft)
- Sustainability program initiatives.

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

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	○	○	○	○

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 Food s (7)

U-M Sustainability Initiatives (8)

Secondary

Sustainability Engagement

U-M (3)

General (4)

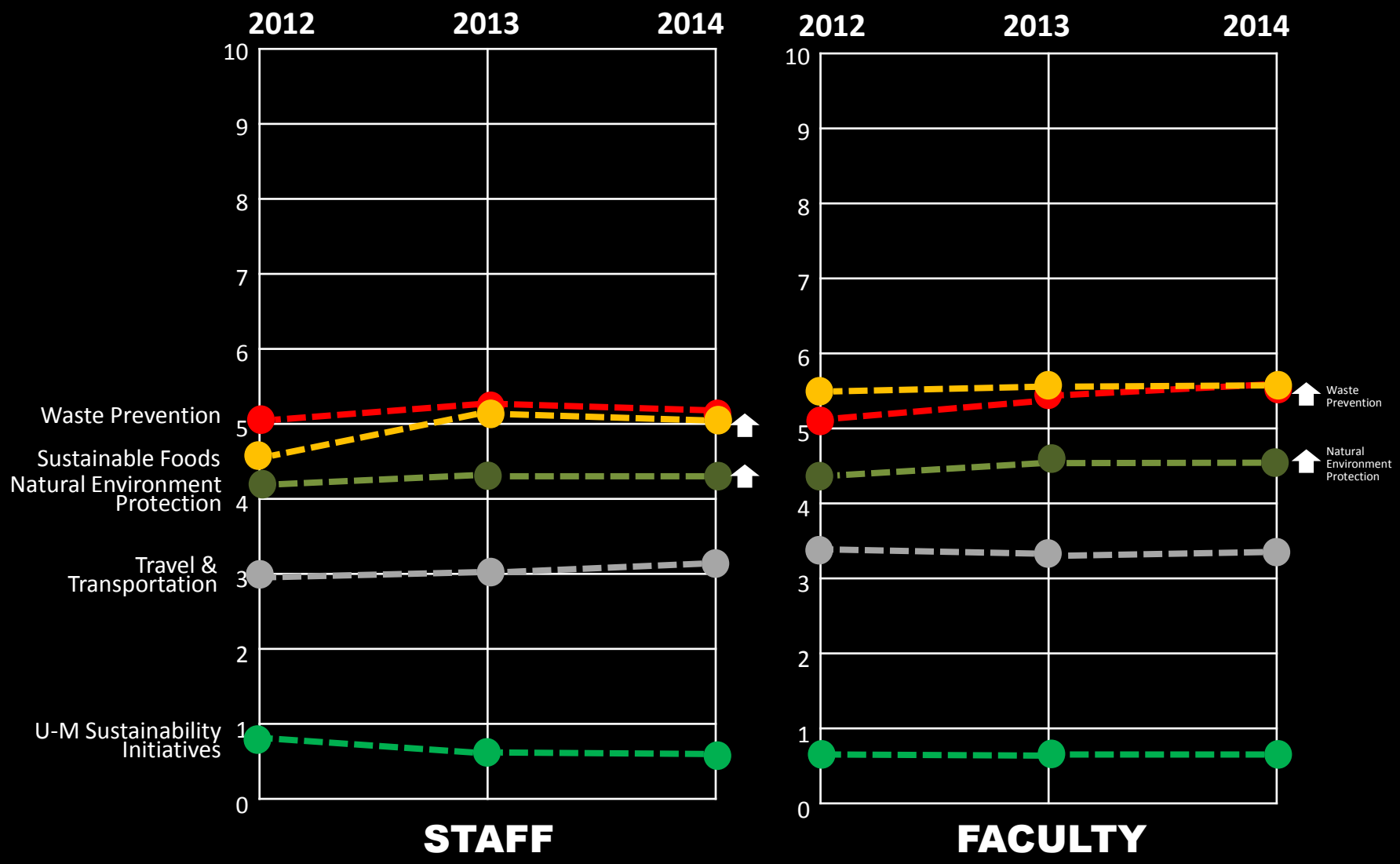
Sustainability Commitment (1)

Sustainability Disposition (3)

Evaluating U-M Sust. Initiatives *(8)*

CULTURAL INDICATORS CHANGES – AWARENESS

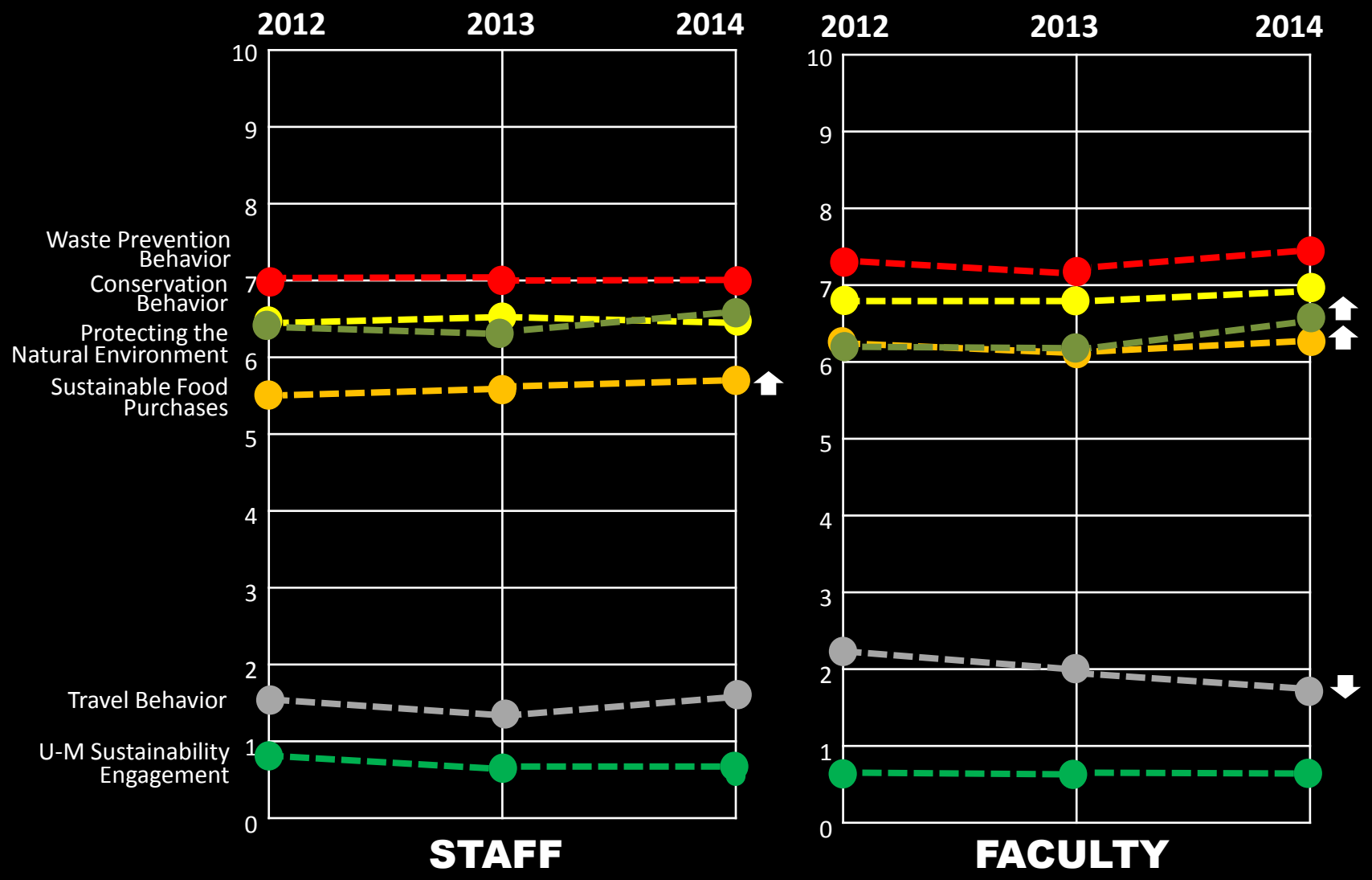
DIFFERENCES AMONG STAFF AND FACULTY



Significant change from 2012

CULTURAL INDICATORS CHANGES – BEHAVIORAL

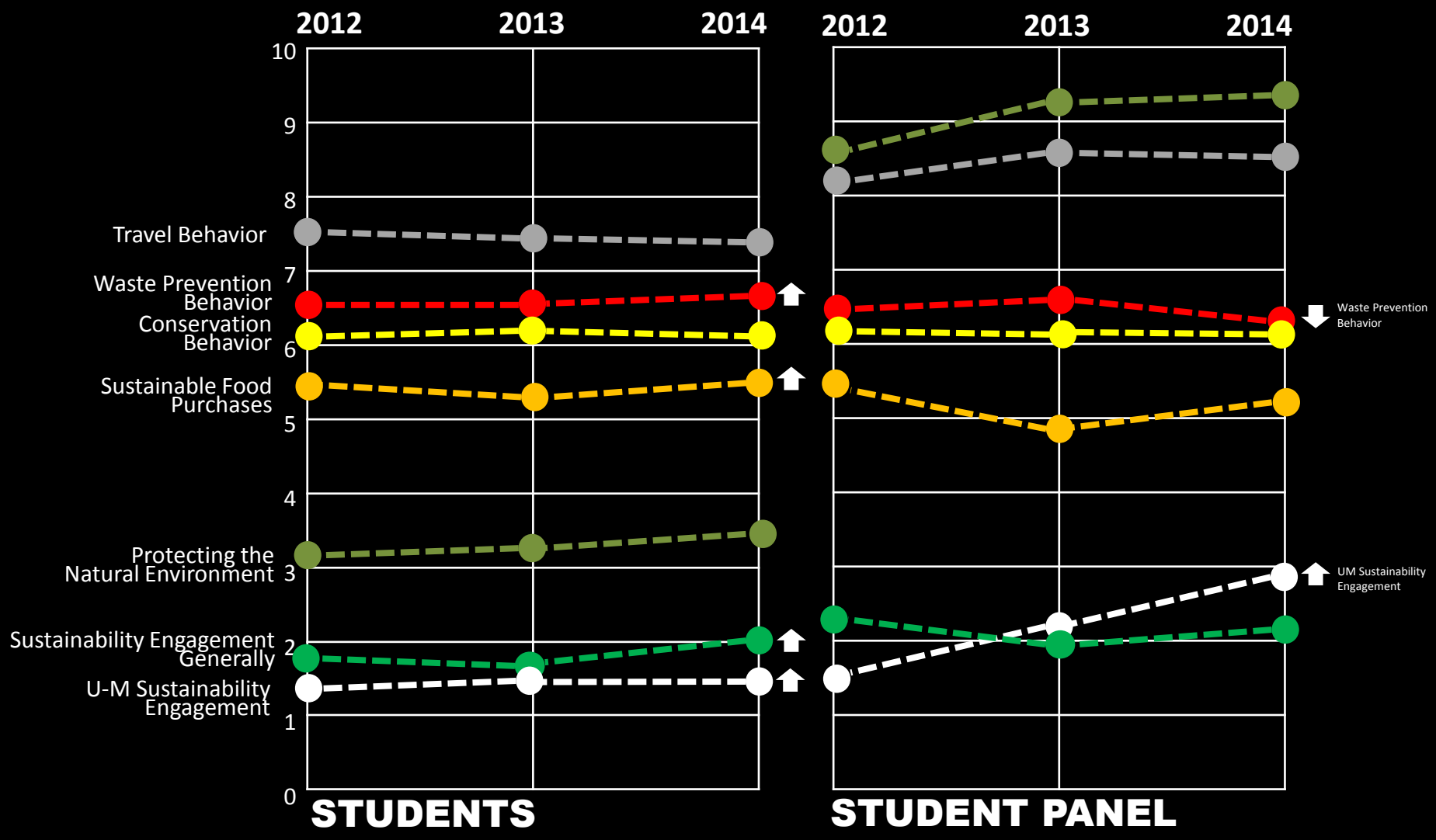
DIFFERENCES AMONG STAFF AND FACULTY



Significant change from 2012

CULTURAL INDICATORS CHANGES – BEHAVIORAL

AMONG STUDENTS



Significant change from 2012

Relationships between Changes in Waste Prevention Behavior, Recycled & Trash Material

Interventions → *Waste prevention behavior* ↑ → *Recycled material* ↑ → *Trash to disposal facilities* ↓

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

U-M Housing[a]	Recycling Pounds per Square Feet[b]				Trash Pounds 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%**

#The term, Trash is sometimes referred to as Waste. In The context of The University of Michigan, it refers to non-recyclables that are diverted to disposal facilities (i.e.land fills, etc)

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

[b]Data are based on pounds of recyclables and trash 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, there were no East Quad students 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.

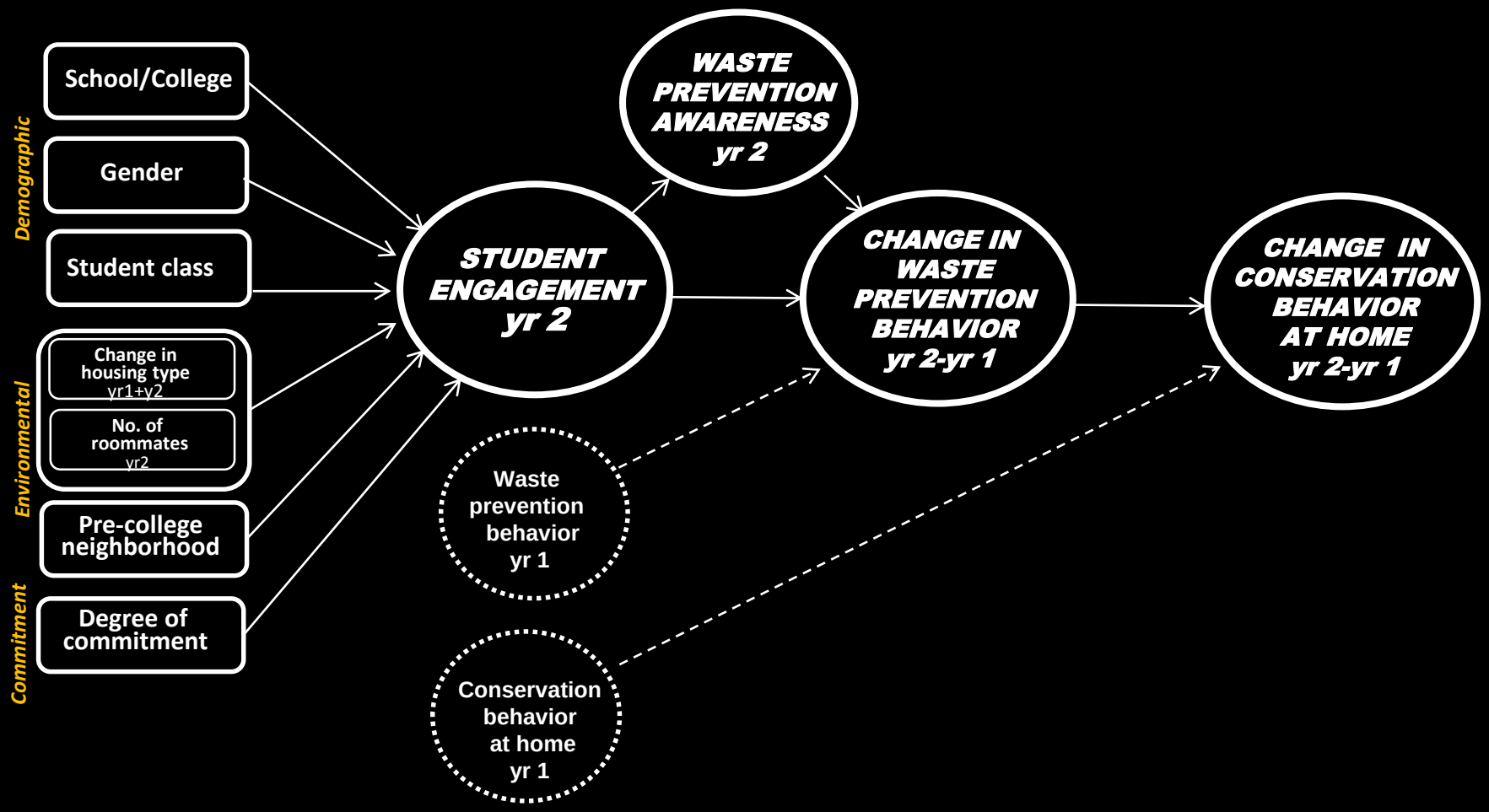
*** 2012 data covering recycling and waste for Alice Lloyd are low since the building was being renovated and therefore unoccupied during the previous year. Change for this building is based on the diffrence between 2014 and 2013

Current Status

- Prepare Year-4 report covering fall 2015 data
- Design and conduct interventions (tests/experiments) in conjunction with U-M operational units
- Continue to promote uses of the data with U-M and elsewhere
- On-going analysis
  - Examine relationships between behavioral change & changes in energy consumption, CO2 emissions , & other "hard" indicators
  - Develop and test causal models using panel data

Panel Analysis

Conceptual Model – Hypotheses



Future Directions

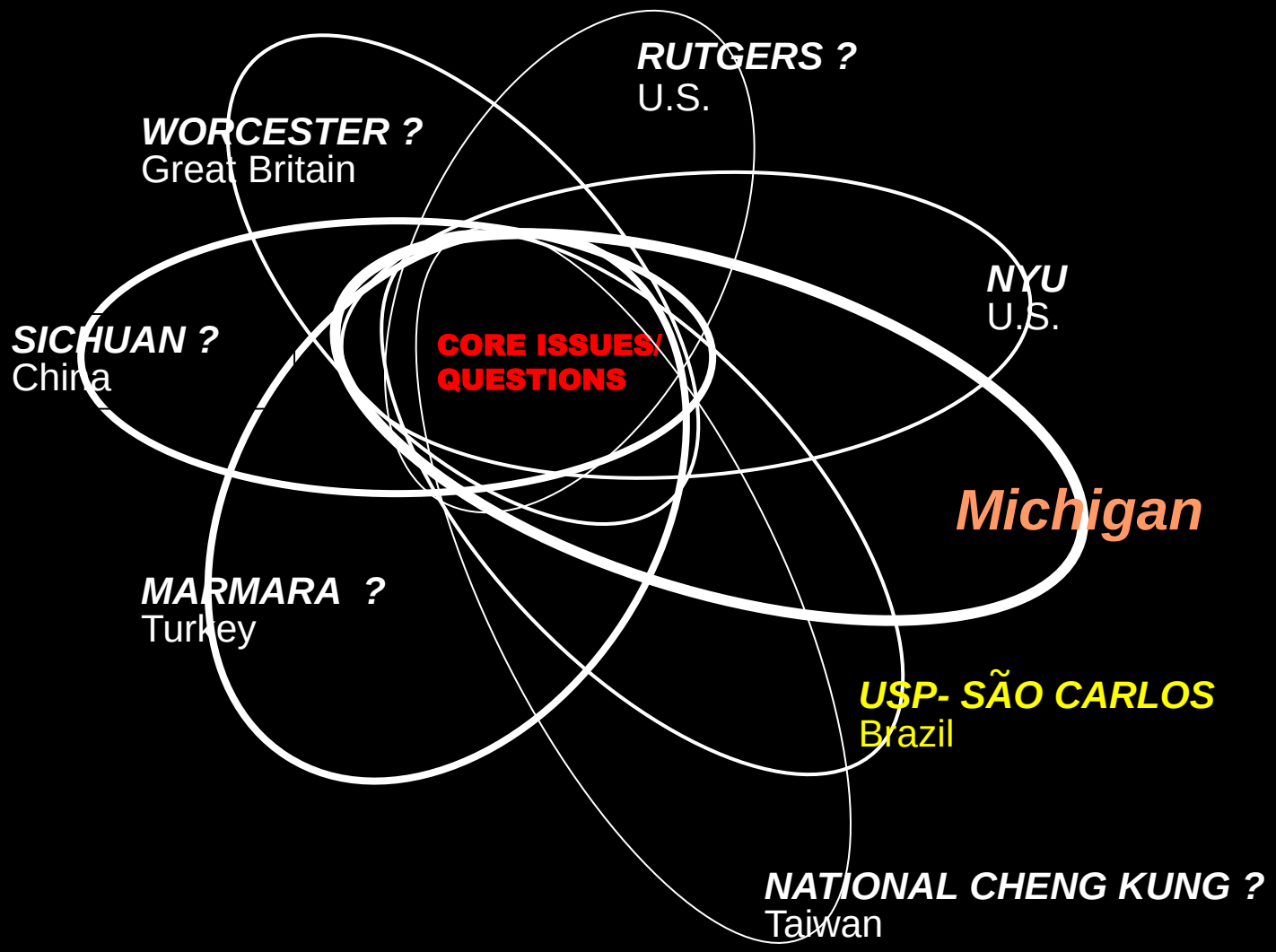
- **Explore Opportunities for Replication in Other Contexts**
  - **Other universities (e.g., collaboration with USP-San Carlos)**
  - **Other organizations (e.g., corporations)**
  - **Cities, neighborhoods, towns, etc.**
  - **Retirement communities**

- **Examine research questions and test hypotheses across environments.**
  - **Understand role of country context in culture of sustainability conceptual models**
  - **Lead to tailoring of interventions**
  - **For example:**

    RQ1: How do norms regarding how long students stay on campus differ between UM and USP-San Carlos?

    RQ2: What role does length of time on campus have on sustainability awareness, behaviors and changes over time?

FUTURE CULTURE OF SUSTAINABILITY STUDIES:
OTHER WORLD UNIVERSITIES



Questions?

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