Mapping the Terrain:
The Role of Teaching in U-M’s Sustainability Initiative

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What is Sustainability?

... meeting the needs of the present without compromising the ability of future generations to meet their own needs.

...Brundtland Commission 1987 Our Common Future
Crossing Planetary Boundaries

Rockstrom et al. 2009 *Nature*
Local-to-Global Scales
Significant North/South Differences

Global Issues

NORTH
Old, rich millions
Affluence
“Global people”
Resource surpluses
Causes of climate change
Technological knowledge
Theory-driven research

Local Issues

SOUTH
Young, poor billions
Poverty
“Local people”
Resource shortages
Impacts of climate change
Traditional knowledge
Action-driven research

Kates et al. 2001 Science

Digital divide

Global Issues

Local Issues
October 2009, President Coleman established:

- Sustainability as a U-M Priority
- Special Counsel for Sustainability
- Office of Campus Sustainability
- Sustainability Executive Council
  President Coleman (Chair) & 6 VPs
  Sets policies and direction
GOALS:

- Curricular and Co-Curricular Education
- Sustainability Research Themes
- Enhanced Engagement
- Green Campus Operations
Campus Operations

Move sustainable operations beyond regulatory standards.

6-Point Environment and Energy Initiative:
- Report annually on environmental performance
- Expand renewable energy portfolio
- Expand alternative transportation options
- Implement and encourage green purchasing
- Expand green construction/renovation policies
- Continue Planet Blue efforts

Campus Sustainability Integrated Assessment
Establish 4-5 key sustainability goals for campus operations
Phase 1: “What and Why”

7 Analysis Teams:


- Faculty leads from 5 academic units
- 43 students from 12 academic units (> 3000 hours to date)
- 150 comments/ideas/suggestions from campus community

Documented current U-M practices; Benchmarked other institutions; Identify initial recommendations
GOALS:

Curricular and Co-Curricular Education
Sustainability Research Themes
Enhanced Engagement
Green Campus Operations
Enhanced Engagement

Engaging academic, business, government, and NGO communities ... 

The “Sustainability Collaboratory”

... where U-M centers of excellence engage the broader campus community and external partners in novel, highly adaptive partnerships to cultivate leaders and solve problems
Sustainability Collaboratory

**Engage** stakeholders to define/solve problems
- Highly participatory approaches (e.g., Integrated Assessment)

**Novel mechanisms** and tools
- Use IT to reduce energy related to collaborations
- Invent novel collaboration tools for distributed work

**Train students** to engage constituents and across disciplines

**Flexible** approaches and research models
- Evolve and adapt to address new and shifting issues
- Rapid engagement of new collaborators and stakeholders

**Study the Collaboratory**
- Assess effectiveness of collaboration models
GOALS:

- Curricular and Co-Curricular Education
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- Green Campus Operations
U-M Sustainability Research Themes

Water and Human Health
Climate Impacts, Adaptation, Mitigation
Livable Communities
**Water and Human Health**

**Goals:**

- Better understand interrelationships between water and health
- Increase aquatic ecosystem resiliency
- Improve access to clean water

**Outcomes:**

- Better technical and policy approaches to restore and protect the Great Lakes and other aquatic ecosystem services
- Better ways to collect, purify, deliver clean water to prevent water-borne pathogens and contamination throughout the world
- Enhance valuation and market-based approaches to protect aquatic ecosystem services
- Assess the ability of current governance systems to ensure sustainable practices and policies
Climate Impacts, Adaptation, and Mitigation

Goals

• Better understand relationships between behavior and climate
• Effective mitigation and adaption strategies that minimize adverse impacts on human and ecosystems

Outcomes

• Next-generation energy technologies and alternatives & the social dimension policies required to support them
• Better forecasts of regional climate impacts through integrated climate, physical, and biogeochemical models and feedbacks
• Improved adaptation and mitigation strategies
• More effective communication of climate information for decision-making under uncertainty
Livable Communities

Goals

• Better understand relationships among behavior, transportation systems, IT, and the built environment
• Sustainable access to resources needed to live and thrive

Outcomes

• Transportation systems and related business models that integrate IT, human behavior, and alternative modes of mobility
• Improved integration of community and land-use planning strategies
• Improved green building principles, technologies, and techniques
• More sustainable technologies and materials that increase the safety and efficiency of transportation modes and infrastructure
• New IT solutions that reduce unnecessary transportation
Enhance Key Program Areas

**Water:** Develop interventions, policies, and technologies to relieve stressed aquatic ecosystems, with a particular focus on the Great Lakes

**Climate:** Integrate climate, ecosystem, and human impacts research to improve mitigation and adaptation approaches

**Built Environment:** Reduce environmental impacts and improve human welfare by integrating materials, engineering, advanced controls, and human feedback

**Social-Ecological Connections:** Understand how to modify human and organizational behaviors that create sustainability challenges and are the keys to their solutions
GOALS:

Curricular and Co-Curricular Education

Sustainability Research Themes

Enhanced Engagement

Green Campus Operations

Engaged Sustainability Scholarship with Impact

Collaborative Methods

Sustainability Themes

Institutional Capabilities

Education | Research | Operations
EDUCATION

Engage students in learning journey that spans disciplines and instills knowledge/skills to cultivate future sustainability leaders

Co-curricular Efforts

Develop and enhance opportunities with:

**Career Development:**
Specialized Careers Guide; “MI time”; Immersion Excursions; Summer Internships

**Campus Life:**
Residence halls; Residential College; Campus Internships, Operations (e.g., Campus IA)

**Community Service:**
Michigan Community Scholars, Global Intercultural Experience for Undergraduates, Ginsberg Center
Curricular Efforts

Increased undergraduate field courses and internships

Sustainability & the Campus course - 2 offerings per year

Graham Undergraduate Sustainability Scholars program
-- First 25 Sophomores selected for Fall 2010

TODAY: discuss innovative methods for:
• embedding sustainability in existing courses?
• creating new interdisciplinary courses?
• new concentrations, minors, majors?

Follow on - Implementation planning (volunteers?)
What Knowledge and Skills are Needed?

Disciplinary?  Multi-disciplinary?  Trans-disciplinary?

What’s appropriate for undergraduates?
What is Sustainability?

... meeting the needs of the present without compromising the ability of future generations to meet their own needs.

... Brundtland Commission 1987 Our Common Future
What is Sustainability?

- Social (People)
- Environmental (Planet)
- Economic (Profit)

Sustain What?
- Actions
- Institutions
- Economy
- Humanity
- Environment

Triple Bottom Line
What is Sustainability?

A sustainable campus, city, community, state, country needs:

- Clean AIR
- Safe, reliable WATER
- Healthy, available FOOD
- Available, efficient SHELTER
- Effective and safe MOBILITY
- Clean, reliable, efficient ENERGY
- Stable ECONOMIC, SOCIAL, HEALTH systems

ECOSYSTEM SERVICES (recreation, biodiversity, waste filtering)
What is Sustainability?

THE MARKETING DEPARTMENT HAS ASKED US TO MAKE OUR PRODUCTS MORE Sustainable.

NONE OF US KNOWS WHAT THAT MEANS.

SO WE CAN EITHER CANCEL THIS MEETING AND GO ASK THEM...

OR WE CAN PRETEND THAT ARGUING WITH EACH OTHER ABOUT THE TRUE MEANING OF "Sustain" IS JUST AS GOOD.

WHILE THAT OPTION IS STUPID, IT WOULD GIVE US THE ILLUSION OF DOING SOMETHING USEFUL RIGHT NOW.

WOULD IT BE ETHICAL TO IGNORE THE LONG-TERM INTERESTS OF STOCKHOLDERS JUST TO FEEL GOOD ABOUT OURSELVES FOR A FEW MINUTES?

I THINK Sustainable. MEANS IT HAS LOTS OF FEATURES.

IT MEANS STURDY!!