About the Institute

The Graham Sustainability Institute is a University of Michigan Provost’s unit. We foster sustainability at all scales by leading stakeholder-centric activities that systematically integrate talents across all U-M schools, colleges, and units. Our work focuses on three key areas:

**Translational Knowledge**
We lead vibrant collaborations of academics, practitioners, and other stakeholders to advance sustainability scholarship and influence real-world decisions.

**Transformative Learning**
We cultivate sustainability leadership by helping students engage across disciplines, appreciate diverse perspectives, think systemically, and pursue action-based learning worldwide.

**Institutional Leadership**
We propel sustainability excellence throughout the University of Michigan by guiding discussions, planning, coordination, and management for university-wide sustainability strategies and activities.

Number of U-M people financially supported in FY14

Distribution of FY14 Graham Support by U-M School/College

- 30% LSA
- 18% SNRE
- 17% Engineering
- 11% Business
- 10% Architecture & Urban Planning
- 5% each Public Policy, Law, Art & Design
- 3% Public Health
- 2% each Medicine, Information, VP Research
- 1% each Law, Architecture & Urban Planning, Public Health, Public Policy, Social Work, Medicine, Theatre & Dance
Welcome to the FY2014 Annual Report for the University of Michigan’s Graham Sustainability Institute. It was an exciting year, with existing programs growing and gaining momentum, and the seeds of new programs being sown. We also attracted critical new resources to support the Institute and programs we run. Most notably, the Graham Family Foundation made another significant commitment to continue supporting core activities, and the Water Center won a five-year, $20 million grant from NOAA to support management of the nation’s 28 National Estuarine Research Reserves.

It was also an important year for defining the Institute’s future. Our entire staff worked to create a 2020 Vision that paints an illustrative picture of where we want the Institute to be six years from now. In the coming year, an external evaluator will engage with our stakeholders to assess our past efforts, and we will use that assessment to inform a five-year strategic plan for implementing this bold vision.

The following pages summarize our most significant work from the past year, but only begin to describe the full range of our efforts. We are also continually experimenting with new approaches to advance our impact in the sustainability field. Recent examples include: convening the directors of sustainability institutes at 10 peer universities to increase our collective impact through collaboration; working with social scientists across U-M to launch an applied research partnership with Environmental Defense Fund; leading U-M’s effort to build sustainability research partnerships with Brazilian universities; and joining with U-M’s Energy Institute, Erb Institute, and Risk Science Center to both produce a new blog devoted to high-level conversation about sustainability and to win a 2015 Michigan Meeting grant, which will focus on Academic Engagement in Public and Political Discourse.

In reflecting upon the past year and looking toward the future, I am grateful for the countless people who make our important work possible and impactful. From our talented staff, to the students and faculty we engage, our external collaborators, the U-M leaders who empower us, the advisors who provide us invaluable guidance, and to our generous financial supporters who make it all possible. Thank you.

— Donald Scavia

From the Director
Number of U-M units involved to date in Graham Integrated Assessments

16

Number of U-M faculty involved to date in Graham Integrated Assessments

70
Our Integrated Assessment Center engages subject matter experts, decision-makers, and key stakeholders in analyzing options so decision-makers can make better informed choices. Last year, we sponsored nine Integrated Assessments (IAs) and in the process engaged hundreds of stakeholders through public events, webinars, and via the IA Center webpages, which had more than 25,000 page views in FY14 from over 18,000 unique visitors. Since 2009, the IA Center has engaged more than 70 faculty and 150 students from 16 different U-M units.

Completed Projects

We concluded two related Detroit efforts during the past year—Sustainability and the HOPE Village Initiative, and Detroit Sustainability Indicators. Results from the former are being used to guide progress towards the goals for the HOPE Village Initiative (to ensure that 100% of residents are educationally well-prepared, economically self-sufficient, and live in a safe and supportive environment by the year 2031) and to inform the creation of an Urban Learning and Leadership Collaborative (partnership of Focus HOPE, U-M, Michigan State University, and Wayne State University). Building on our Detroit Sustainability Indicators project, we collaborated with Data Driven Detroit to implement a series of workshops designed to empower community stakeholders to make data-driven decisions. We also concluded two Livable Communities through Sustainable Transportation IAs—one focusing on consumer decision making around multi-modal transportation options (driving, public transit, biking, walking) and the other examining policy options and the sustainability impacts of autonomous vehicles. The research teams presented findings to the US Department of Transportation at the Transportation Research Board Annual Meeting, and at the 2014 World Congress of Intelligent Transportation Systems in Detroit. Final reports will be posted to the Graham website this fall.

Active Projects

We continued work on two Water and Health IAs: examining the maternal-child health impacts of small-scale gold mining in Ghana; and examining the relationship between drinking water contamination and gastric cancer in Peru. Both projects are entering their third and final year and are developing key policy recommendations following a final series of stakeholder workshops. The IA Center also produced a compelling video covering both projects.

Our IA on Hydraulic Fracturing in Michigan gathered substantial interest following the release of seven technical reports in September 2013, which were downloaded from the Graham website more than 1,500 times in the past year. In the fall of 2014, our final IA report will be released for public comment and peer review by a panel of national experts.

Established as a partnership with our Water Center, the Great Lakes Water Levels IA was announced in early 2014 and will examine options for local, state, and regional entities to better adapt to changing lake levels. A bi-national advisory committee of government, environmental NGO, and research representatives is in place, and in the fall of 2014 we will form analysis teams to begin working on this important issue.
Number of institutions supported by the Water Center in FY14

55

Number of people supported by the Water Center in FY14

183

Number of U-M faculty (from 12 units) supported by the Water Center in FY14

54
With generous support from the Fred A. and Barbara Erb Family Foundation, our Water Center continued its foundational work of identifying, supporting, and facilitating exceptional research and leveraging the information we’re generating to influence policy and management decisions. Our recent work focuses on three specific outcomes: 1) prioritizing knowledge gaps and enhancing regional dialogue; 2) filling those gaps; and 3) providing input to key regional drivers, including developing a science framework for the next Great Lakes Restoration Initiative (GLRI).

With input from our multi-sector Advisory Committee and review panels, we have thus far supported 37 projects involving 183 researchers across 55 institutions. Within U-M alone, our projects supported 54 faculty from 12 units. By receiving broad-based input, the rigorous selection process enables us to most effectively identify and begin filling key knowledge gaps. Examples of high-impact projects include: assessing the effects of microplastics on lake ecosystem health; optimizing regional approaches for restoring native fish migrations while controlling invasive species; improving water quality and well-being in Detroit; and restoring lake ecosystem health under a changing climate.

This year we continued to sponsor activities that bring stakeholders and faculty together to enhance regional dialogue. Examples include convening Soil and Water Assessment Tool (SWAT) modelers to identify the most pressing model development gaps, and bringing together a diverse group of faculty from across the university to lay the groundwork for a new undergraduate water minor through U-M’s Program in the Environment in the College of Literature, Science, and the Arts (LSA).

The Water Center is increasingly seen as a place to bring challenging issues. For example, Environment Canada and the US EPA are funding us to lead a team of modelers to inform the new nutrient loading targets for Lake Erie under the revised Great Lakes Water Quality Agreement. The State of Michigan Department of Environmental Quality Water Resources Division asked us to assist them in determining the best strategy for increasing and sustaining the state’s investments in water quality facilities, personnel, and training. The National Wildlife Federation supported our modeling work on the potential impacts of a pipeline spill in the Straits of Mackinac that has since enabled them to attract additional funds for us to conduct a more detailed assessment of potential ecological and economic impacts of such a spill.

We are encouraged by the unveiling of the second GLRI Action Plan, which incorporates a science-based adaptive management framework that was missing from the initial plan. This need was something the 20 leaders of Great Lakes Centers and Institutes, convened by the Water Center, emphasized in their input to the GLRI revision process.

Going forward, we will greatly increase the impact of our work through our recent award of $20 million to manage a five-year program focused on providing user-oriented science in support of NOAA’s network of 28 National Estuarine Research Reserves. This significantly expands our reach into the marine environment and will broaden the Center’s impact beyond our core work on the Great Lakes.
Number of stakeholder engagement activities sponsored by Climate Center in FY14: 24

Number of participants in Climate Center FY14 stakeholder engagement activities: 1168
As the climate continues to heat up globally and locally, our Climate Center is on the front line of providing useful and useable climate information to decision makers across the Great Lakes Region.

In its fourth year, our Great Lakes Integrated Sciences and Assessments (GLISA) program, a partnership with Michigan State University, continued to support myriad users across the region. With strong partnerships in the agricultural, public health, natural systems management, urban adaptation, and tribal communities, GLISA embraces its mission of contributing to the long-term sustainability of the region in the face of a changing climate. Last year, we provided financial and technical support to five boundary organizations that connect their stakeholders with our scientific guidance:

- **Michigan Sea Grant**: Educating Great Lakes harbor and port operators about how climate change will impact their operations and business
- **Macalester University**: Engaging low-income and minority neighborhoods in St. Paul, MN around risks from flooding and heat waves
- **Four Native American Tribes**: Integrating anticipated climate changes into their approach to foresight planning in the region
- **Alliance for the Great Lakes**: Understanding how changes in climate will alter ravine ecosystems in Northeast Illinois and Southeast Wisconsin
- **Huron River Watershed Council**: Building a multi-jurisdictional approach for integrating climate impacts into hazard mitigation plans

Nationally, we played a leading role in the Fourth National Climate Assessment (NCA), with our researchers co-leading the Midwest Chapter and editing a book on climate impacts that provided critical input to the NCA. We also co-hosted the Midwest Rollout of the NCA and produced a synthesis report focused on the Great Lakes region.

With key support from the Kresge Foundation, our Great Lakes Adaptation Assessment for Cities (GLAA-C) project supported additional urban-focused climate adaptation initiatives across the region and organized a regional convening of climate adaptation practitioners, researchers, and municipal decision makers. Supported projects included:

1. **City of Kingston, Ontario**: Integrate health impact assessment findings into a public school campaign and extreme weather impact analysis into emergency management plans.
2. **City of Ann Arbor, Michigan**: Created informational videos on local impacts of climate change and what residents can do to adapt.
3. **City of Toledo, Ohio**: Promoted green infrastructure incentives and engaged private land holders to bolster stormwater management practices in a vulnerable area.
4. **City of Thunder Bay, Ontario**: Developed a community outreach campaign focused on low impact development as a mechanism for stormwater management.
5. **City of Dayton, Ohio**: Conducted a survey of residents’ climate perceptions to inform a city-wide climate awareness campaign.
6. **City of Flint, Michigan**: Rehabilitated the wetland portion of Flint’s largest park, and developed educational signage connecting wetlands and climate change.

To maximize the impact of our work across the Climate Center, we also embedded social science analysis of the effectiveness of our engagement and intervention approaches. This analysis led to new understandings of how knowledge is disseminated throughout regional and social networks and how various intervention strategies can be leveraged to reach different audiences.
"The Dow Fellowship has in many ways defined the culminating years of my doctoral work. It has provided a space to distill some of the broader ideas in my work and gain perspective on how these ideas fit into other disciplines.”

— 2014 Dow Sustainability Fellow

Number of Dow Sustainability Fellows Supported in FY14 96

Percent of U-M Schools/Colleges participating in the Dow program to date

- 6% Law
- 8% Public Health
- 8% Architecture
- 12% LSA
- 12% Business
- 20% Policy
- 23% SNRE
- 2% each Information, Medicine, Education, Art & Design, Music, Theatre & Dance
- 1% each Medicine, Education, Music, Theatre & Dance
- 2% each Information, Art & Design, Education

U-M School/College Affiliations for All Supported Students to Date
ade possible through a transformational gift from The Dow Chemical Company, the university-wide Dow Sustainability Fellows Program spans academic levels and draws upon diverse disciplines across the U-M Schools and Colleges. Dow Sustainability Fellows are committed to finding interdisciplinary, actionable, and meaningful sustainability solutions on local-to-global scales. The program aspires to prepare future sustainability leaders to make a positive difference in organizations worldwide. On behalf of the U-M Provost, we administer this innovative program.

At all three fellowship levels—masters/professional, doctoral, and postdoctoral—Dow Sustainability Fellows explore complex sustainability topics in forums that draw on expertise and perspectives across a broad range of disciplines. Spanning a dozen U-M Schools and Colleges and dozens more departments therein, fellows tackle issues and subjects as wide ranging as:

- Electric Vehicle Impacts
- Responsive Building Envelopes
- Biofuels and Water Quality
- Cell Phone Supply Chains
- Energy Entrepreneurship
- Acoustic Ecology
- Rainforest Biodiversity
- Bacteria in Drinking Water
- Pollution & Birth Outcomes
- Onshore Wind Development
- Sustainability in K-12 Curriculum
- Wastewater Recovery Perceptions
- Resilience to Climate Change
- Driverless Taxis
- Community-based Reforestation
- Chemicals in Products
- Water and Energy Stressors
- Electric System Futures
- Local Food Systems

The program also fosters interaction across cohort levels. For example, doctoral and postdoctoral fellows participate in joint workshops to build critical professional skills such as communicating research outcomes to the media and general public. As the program grows, cross-cohort interactions will continue to expand, including through an annual symposium beginning Fall 2014 that will bring together fellows across all levels for a full-day workshop to learn with and from one another.

The Dow Distinguished Awards for Interdisciplinary Sustainability competition is also producing positive results with innovative projects emerging from multi-disciplinary student-led teams across the university. Award winning projects last year focused on:

- Developing a comprehensive inventory of greenhouse gas emissions in Detroit
- Implementing incentives for landlords to implement energy efficiency upgrades in rental units
- Retrofitting a 112-year-old house to be self-sustaining in energy needs and water resources
- Investigating how water-demand management in India contributes to climate change resiliency

To expand its reach across the university, the competition now provides seed grants for up to 20 teams, with each team representing at least three U-M units. Based on progress achieved and potential impact, the teams with the most impressive results will receive larger awards to continue and expand their work.

After only two years of activity, the program is proving to be an innovative learning platform and a tremendous success. There is a high degree of enthusiasm for the program across the university, with 74% of U-M Schools and Colleges participating to date. The Dow program has brought on more than 100 Fellows at the Masters/Professional, Doctoral and Post-doctoral levels, and dozens more U-M students have been supported through the Distinguished Awards competition. All of these students have been inspired to reach across disciplinary boundaries and incorporate diverse perspectives as they pursue their passion for making the world more sustainable.
Graham Sustainability Scholars

At the completion of its fourth year, this innovative program has produced 67 alumni and includes 60 current students. The program continues to achieve high levels of success and satisfaction among students and other stakeholders. In recognition of the increasing number of alumni, we created several networking opportunities including a revised alumni newsletter, a LinkedIn group, and an alumni panel discussion for current undergraduates. Our two core seminars—Systems Thinking for Sustainability and Sustainability Leadership Development—continued their evolution toward a case-based, engaged learning methodology that focuses on personal reflection and skills development. Our second annual orientation at Sleeping Bear Dunes began this process through formalized activities and instruction as well as informal cohort-building. Our annual outing to the U-M Challenge Program focused on identifying individual leadership strengths and weaknesses. We also placed increased emphasis on our “coffee with practitioners” series, which brought in 12 diverse sustainability professionals—including entrepreneurs, school teachers, corporate sustainability managers, community activists, venture capitalists, organic farmers, and nonprofit program managers—for informal discussions and networking with current students. The program continues to receive widespread recognition, with several conference talks dedicated to the program as well as two peer-reviewed articles and one book chapter. This past year’s exit surveys were particularly strong in expressing how the program was a core part of our students’ academic, co-curricular, and social experience at U-M. The program is often cited as a “formative” and “path altering” experience for participants.

127

Number of Graham Sustainability Scholars to date

27

Number of distinct academic programs represented among FY14 Graham Scholars
Curricular Collaboration

During the past year, we supported four action-based, interdisciplinary sustainability courses: “Food, Land & Society (Cuba)”, “Maternal/Child Health, the Environment, and Pollution in Africa (Ghana)”, “Sustainability & Fossil Energy: Causes & Consequences (Wyoming, USA)”, and “Sustainability & the Campus (Ann Arbor, USA)”, which continued to connect students with U-M operational staff to advance campus sustainability.

We continued efforts to integrate sustainability across the curriculum by catalyzing curricular initiatives and increasing access to and awareness of sustainability-related course offerings. For example, we helped shape and supported discussions leading to new undergraduate minors in sustainable water and sustainable food. We also continued to maintain an online database featuring all U-M sustainability course offerings, as well as provided data for sustainability “course tags” in the LSA course guide.

Michigan Journal of Sustainability

Initiated by a team of Doctoral Fellows, the Michigan Journal of Sustainability is open-access, student-run, and indexed by Google Scholar. Organized around U-M’s sustainability research themes of Water, Climate, and Livable Communities, the journal aims to publish timely, innovative, stimulating, and informative articles that translate scholarly sustainability research into useful formats for practitioners and policy makers. The first issue was released in September 2013 with seven feature articles, three Teaching & Learning pieces, and one Lab & Field Note covering topics ranging from climate change adaptation to new and creative forms of environmental education. MJS had an open call for abstracts in early 2014, with the second issue scheduled for publication in Fall 2014. A third issue, focused specifically on climate adaptation, is planned for Spring 2015.

“Graham Scholars opened up a new field of interest for me and has steered my career path in a new direction that emphasizes sustainability as a leadership form.”
– 2014 Graham Sustainability Scholar
Cultural Indicators

The Sustainability Cultural Indicators Program (SCIP) is a multi-year survey that assesses the culture of sustainability on U-M’s Ann Arbor campus. Two rounds of data collection have been completed with over 4,500 respondents each year. Survey results are discussed with operations personnel to generate intervention ideas that can drive progress toward campus sustainability goals. In general, students, faculty, and staff report high levels of commitment to sustainability but lower levels of awareness, behavior, and engagement on a range of topics such as recycling, energy conservation, and transportation. Last year, there were 571 views of the project website and the Year 1 report was among the top ten downloads from the Graham website. More than 40 requests have been received for copies of the survey instrument from institutions throughout the world. Three book chapters and one journal article have been produced and SCIP has been accepted for presentation at 10 conferences.

Planet Blue Ambassadors

As of July 2014, there are over 900 staff/faculty and 500 student certified Planet Blue Ambassadors (PBA) who completed all five training modules and made over 40,000 pledges of action on the campus sustainability goals. In the past year, Ambassadors participated in nearly a dozen in-person events, including a highly successful “Healthy Holidays, Healthy Stuff” open house. We partnered with U-M programs such as Property Disposition, Climate Center, Waste Management, Michigan Dining, and the Office of Campus Sustainability to jointly promote sustainability efforts. Our annual sustainability guide (“Welcome to Planet Blue”) was distributed to nearly 11,000 students and staff, including all new U-M staff members, all students living in University Housing, and many other students through a partnership with Beyond the Diag. Driven by data from the Sustainability Cultural Indicators Program and feedback from our participants,
we significantly updated and overhauled our messaging and communication, including the much-read monthly newsletter.

Through the **Planet Blue Student Leader Program (PBSL)**, 24 students living in U-M Housing served as peer-to-peer sustainability advisors and participated in an experiential-learning seminar each semester. These students also led Kill-a-Watt (an inter-dorm energy saving competition) and RecycleMania (a national inter-campus waste reduction competition) in the residence halls. Successful engagement events included working with dining staff to stop using disposable tableware for onsite meals in the North Quad Dining Hall on weekends. East Quad students worked with Java Blu, an in-house café, to promote the use of reusable mugs. As a culminating project, PBSLs developed a “Sustainability in Housing” visioning report, which was very well received by Housing leadership.

**Student Innovation Fund**

The **Planet Blue Student Innovation Fund** provides competitive grants for student-led campus sustainability projects that are innovative, transformative, and visible.

Projects approved for funding in FY14 include:

- Solar-Powered Workstations on central and north campus
- Honeybee Sanctuary on a central campus rooftop
- Native Grass Restoration around the pond by the School of Music, Theatre and Dance
- Community Composting Collective expansion to four additional schools
- Food Recovery Network expansion to all dining halls on campus.
- Environmental Community Program pilot within Michigan Community Scholars Program

“Being a Plant Blue Ambassador has motivated me to raise the bar on my personal goal of sustainable commuting from one day per week to two or three times. I’ve been successful since May 2013!”

— U-M Senior Architect
To learn more about the Graham Sustainability Institute, or to schedule a visit to one of our administrative or research offices, please contact us at (734) 615-8230 or graham-institute@umich.edu

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