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Michigan Athletics Scope 3 Analysis and NCAA Power 5 Landscape Assessment

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Executive Summary

As the University of Michigan and other universities set net zero goals, a key area of focus is integrating sustainability within athletics. College sports are evolving at an unprecedented pace, from conference realignments and expanded football playoffs to NIL deals and massive new broadcasting agreements. This accelerated growth will raise emissions, as a recent study suggests that some conference realignments could nearly double emissions in football, underscoring the importance of proactive sustainability measures¹. This report details the third iteration of a research project, sponsored by the Erb Institute at the University of Michigan, that aims to enhance sustainability within Michigan (U-M) Athletics.

The 2023-2024 project team consisted of five Erb undergraduate fellows: Ashley Dukellis, Natalie DeSarbo, Ella Simon, Rohan Shah and Andrew van Baal. Erb Fellows alumni CY Cheng and Zachary Marmet as well as Professor Sara Soderstrom served as advisors for these student leaders.

The previous 2022-2023 project team assessed Scope 1 and 2 emissions from the U-M Athletic Department, and in their final report, they identified which Scope 3 categories were material to U-M Athletics and outlined the data collection process for each category.

Leveraging the prior groundwork, this 2023-2024 project team carried out a Scope 3 emissions assessment for U-M Athletics and a landscape assessment of athletics sustainability initiatives within the broader Power 5 (Big 10, SEC, ACC, Big 12 and PAC-12) conferences.

The team estimated Scope 3 emissions from three categories—waste, business travel, and purchased goods and services—using the GHG Protocol. The data pointed to purchased goods and services as the largest emitter, followed by business travel and waste emissions. Discussions with key personnel, paired with our findings, underscored the need for better data management and tracking within these Scope 3 categories, establishing partnerships between U-M Athletics and external stakeholders to advance sustainability, and strengthened collaboration between the Office of Campus Sustainability and U-M Athletics.

The team conducted a landscape analysis of the universities within the Power 5 conferences over seven different categories:

1. **Are there university-wide sustainability goals?**

2. **Is the university reporting to AASHE Sustainability Tracking, Assessment & Rating System (STARS)?**

3. **Are there university-wide sustainability personnel?**

4. **Are there athletic-department-specific sustainability goals?**

5. **Are there university-wide GHG emissions data?**

6. **Are there student-athlete or athletic-department-driven initiatives?**

7. **Are there athletic department waste initiatives?**

Each university was ranked from 0 to 3 for each category with category-specific targets, and earned a final averaged score of 0 to 3. This assessment indicated a need for U-M to align sustainability initiatives sponsored by U-M Athletics with those of key competitors (such as Ohio State University and the Big 10).

The team had two high-level recommendations for U-M. The first recommendation is to support a student-led, student-athlete/Erb Undergraduate Fellows student organization focused on advancing sustainability within U-M Athletics. The second is to create dedicated personnel within U-M Athletics to focus on department-level sustainability.

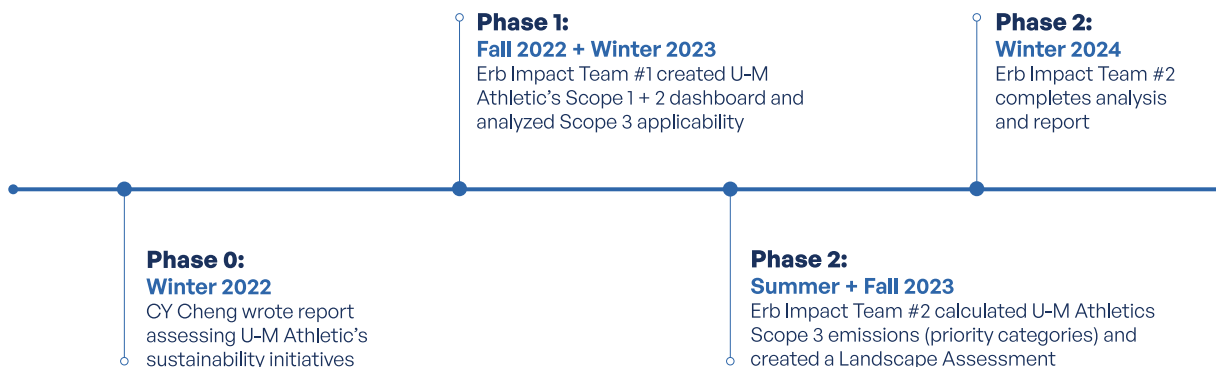
Project Overview

This project has undergone three phases: Phase 0, Phase 1 and Phase 2. Each phase’s ultimate objective has been improving environmental sustainability at U-M Athletics.

The current team focused on Phase 2 of this project, which had two main objectives:

- 1. Scope 3 Emissions:**
Organizing and analyzing data from high-priority subcategories of the Athletic Department’s Scope 3 Greenhouse Gas (GHG) Emissions
- 2. Landscape Assessment:**
Performing a sustainability landscape assessment on the universities within the Power 5 conferences

Project Timeline:



The assessment of U-M Athletics’ sustainability began with CY Cheng’s capstone project for Professor Sara Soderstrom’s Environ 391: Sustainability and the Campus course at U-M (Phase 0). The work was further formalized into an Erb Impact Project (Phase 1), a funded extracurricular opportunity for [Erb Institute](#) students.

The Phase 1 team consisted of student researchers Abby Williams, Chloe Valentino, Zach Marmet, Julia Kaplan and Zane Jones, as well as faculty advisor Soderstrom. Their work quantitatively assessed U-M Athletics’ Scope 1 and 2 (natural gas and electricity) emissions, and qualitatively explored Scope 3 emission strategies. The published written analysis and interactive Tableau dashboard can be found here: [Michigan Athletics Scope 3 Analysis and NCAA Power 5 Landscape Assessment](#).

Michigan Athletics Scope 3 Emissions Analysis and NCAA Power 5 Landscape Assessment

U-M Athletics Background

University of Michigan’s Athletics Program, a proud member of the Big Ten Conference, is home to 27 men’s and women’s sports teams. Its storied history, dating back to 1865, is dotted with numerous national championships across a variety of sports, highlighted by a strong football legacy. The program is supported by state-of-the-art facilities like the iconic Michigan Stadium and emphasizes holistic student-athlete development, ensuring success both on and off the field. As the program looks to the future, it remains committed to being the “Leaders and Best” by competing at the highest level, pursuing innovative sustainability practices, and continuously investing in student-athlete development.

Project Context

In a collaboration between the Erb Institute and Michigan Athletics, this project explores Scope 3 indirect emissions from Michigan Athletics and maps out a sustainability landscape assessment across the former NCAA Power Five conferences. The analysis covers Scope 3 emissions related to U-M Athletics’ purchased goods and services, waste, and travel data, and benchmarks specific sustainability metrics across the collegiate landscape. This storyboard provides detailed insights into U-M Athletics’ greenhouse gas (GHG) inventory, compares sustainability rankings across the Power Five, and shares details of our research process based on interviews and roundtable discussions.

Michigan Athletics Scope 3 Emissions Analysis and NCAA Power 5 Landscape Assessment

Conclusion

Our project focused on creating a baseline emissions assessment for high-emitting GHG categories, pinpointing emission hotspots within U-M Athletics data. Our work also provided greater visibility into the sustainability efforts across the collegiate landscape and offered deeper insights into U-M Athletics’ position relative to its peers. As the University of Michigan outlines its university-wide climate action strategy, our mission is to continue supporting the Athletics program, which we believe has the unique opportunity to build on its past successes and serve as a blueprint for sustainable athletics.

Future Recommendations

Short-term: Establish a student-led, Student Athlete/Erb Undergraduate Fellows student organization focused on advancing sustainability within U-M Athletics

Long-term: Appoint a dedicated role within U-M Athletics to focus on program-level sustainability initiatives

Scope 3 Emissions Recommendations

- Improve data management and tracking for business travel, waste, and procurement to better monitor and reduce emissions
- Establish partnerships between U-M Athletics and external stakeholders (e.g., key suppliers) to promote sustainability
- Strengthen collaboration between the Office of Campus Sustainability and U-M Athletics to unify sustainability efforts

Landscape Assessment Recommendation

- Align sustainability initiatives sponsored by U-M Athletics with those of key competitors (e.g., Ohio State University, Big Ten)

The Phase 2 team consisted of student researchers Natalie DeSarbo, Ashley Dukellis, Ella Simon, Rohan Shah and Andrew van Baal, with alumni project leads Zach Marmet and CY Cheng, as well as continued faculty guidance from Soderstrom. Inspired by insight gathered at Phase 1 roundtable sessions, Phase 2 focused on two objectives: collecting and analyzing U-M Athletics’ Scope 3 emissions data, and assessing sustainability performance and initiatives across Power 5 conferences.

The Phase 2 team held a roundtable discussion in December 2023 to discuss preliminary findings. Attendees included U-M Athletics student-athletes, faculty from the Erb Institute, School for Environment and Sustainability and Ross School of Business, U-M Athletics administrators and staff, and Office of Campus Sustainability staff. Feedback from this roundtable trended positive, with attendees suggesting that our next steps focus on increasing collaboration among diversified stakeholders within U-M Athletics, as well as cultivating media attention for lesser-known sustainability endeavors that U-M sponsors currently. The project began in June 2023 and concluded in June 2024.

Scope 3 Emissions Overview

Scope 3 emissions refer to indirect emissions that occur in the reporting organization’s value chain, including both upstream and downstream emissions. Scope 3 emissions, unlike Scope 1 and 2, are beyond a company’s direct control, complicating tracking due to challenges including data availability and quality, scope boundaries, complexity within supply chains and varying emission factors/methodologies. Scope 3 emissions often make up the bulk of an organization’s emissions, making detailed accounting critically important². The University of Michigan, with over 50,000 enrolled students³ and over 10,000 faculty and staff⁴, set scope-based emissions targets. These include achieving Scope 2 net zero by 2025 and Scope 1 net zero by 2040, and establishing targets for Scope 3 net zero by 2025.⁵

The Phase 1 team offered methods for Scope 3 emission data extraction and identified the categories most relevant to U-M Athletics’ operations. Following their recommendations, the Phase 2 team estimated emissions related to the following categories aligned with the GHG Protocol. Categories were determined based on the availability of data and the overall estimated impact of emissions:

- Purchased goods and services (Category 1)
- Waste generated in operations (Category 5)
- Business travel (Category 6)

Methodologies from the GHG Protocol were applied based on the defining metrics of each category (for example, determining air travel emissions from flight data). Emissions calculations were made for fiscal year 2023 (FY23), resulting in 4,089 MTCO₂e for Category 1, 267 MTCO₂e for Category 5, and 2,596 MTCO₂e for Category 6, totaling 6,952 MTCO₂e.

Scope 3 Categories (GHG Protocol)	Emissions Generated in FY23 (MTCO ₂ e)
Purchased goods & services (Category 1)	4,089
Waste generated in operations (Category 5)	267
Business travel (Category 6)	2,596
Total	6,952

This total is equivalent to the emissions generated from 334 National Football League (NFL) games or roughly 19.6 regular seasons from one NFL team⁶. With the University of Michigan developing a plan to manage its Scope 3 emissions, our team is focused on identifying opportunities for near-term abatement strategies for U-M Athletics.

Landscape Assessment Overview

The landscape assessment focused on the Power 5 conferences⁷:

- Atlantic Coast Conference (ACC)
- Big 10 Conference
- Big 12 Conference
- Pac-12 Conference
- Southeastern Conference (SEC)

These collegiate conferences were selected for their leading status in athletic performance, viewership and revenue. They feature 68 universities playing at the NCAA Division I level. U-M Athletics is a member of the Big 10 Conference.

We conducted a nationwide landscape assessment across the Power 5 conferences to best understand the implementation and extent of sustainable initiatives within NCAA athletics programs. Benchmarking U-M Athletics against these programs highlights both its achievements and areas needing improvement to maintain competitiveness and advance sustainability efforts.

Our research showed that sustainability initiatives are more common at the university-wide level than within athletic programs or operations. Following this, the team concentrated on pinpointing universities that have effectively implemented sustainability within their athletics programs. This multi-leveled research process led to the development of recommendations for U-M Athletics to adopt, aiming to position the program as a leader in sustainability among its peers.

Methodology

Scope 3:

Interviews were conducted with the Office of Campus Sustainability (OCS) and U-M Athletics to understand the operations and collect preliminary data for the Scope 3 categories assessed. Interviewees included:

- Alison Richardson, Program Manager, OCS
- Ken Keeler, Senior Sustainability Representative, OCS
- Paul Dunlop, Associate Athletic Director, U-M Athletics
- Andra Krievs, Chief Financial Officer, U-M Athletics

These interviews provided insight into U-M's data collection methods. Following these interviews, the key personnel provided our team with data that was then used to estimate emissions. The GHG Protocol served as guidance for our emissions calculations.⁸

Landscape Assessment:

Our team analyzed the universities within the Power 5 conferences. Each university earned an average score of 0-3 on our rating scale, which includes seven different categories analyzing sustainability initiatives from the university-wide level to the athletic department. Data was collected from online, publicly available sources for each university.

The following seven categories define the categories for the rating scale:

1. Are there university-wide sustainability goals?
2. Is the university reporting to AASHE Sustainability Tracking, Assessment & Rating System (STARS)?
3. Are there university-wide sustainability personnel?
4. Are there athletic-department-specific sustainability goals?
5. Are there university-wide GHG emissions data?
6. Are there student-athlete or athletic-department-driven initiatives?
7. Are there athletic department waste initiatives?

Scores within each category vary in criteria, but all scores follow a scale from 0 (low performing) to 3 (high performing). To learn more about the methodology of this project, please follow this [link](#).

Findings

Scope 3 Emissions

Key findings are presented below from the analysis of the three most significant Scope 3 categories for U-M Athletics: purchased goods and services (Category 1), waste generated in operations (Category 5) and business travel (Category 6). For a better understanding of metric tons of CO₂, explore these articles that help illustrate the scale of emissions (found [here](#) and [here](#)).

These three categories had a total of 6,952 metric tons of CO₂e.

1. Purchased Goods and Services (GHG Protocol Category 1)

Purchased goods and services contributed 4,089.84 MTCO₂e of emissions. The top 10 highest-emitting subcategories include:

Purchased Goods and Services Categories	MT CO ₂ e
Food service contractors	853.34
Sporting and athletic goods manufacturing	390.82
Landscaping services	316.09
Janitorial services	210.28
Security guards and patrol services	205.29
Full-service restaurants	139.02
All other specialty trade contractors	94.94
Other industrial machinery manufacturing	90.69
Software publishers	84.53
Plumbing, heating and air-conditioning contractors	78.99

Table: Purchased goods and services emissions by top 10 subcategories.

In FY23, U-M Athletics allocated about \$75 million to purchased goods and services, accounting for almost 33% of FY23’s operating expenses. The emission hotspots highlighted in the chart above correspond with key operations within U-M Athletics. While many categories are hard to abate, owing to their complexity or because they are entirely outsourced, we believe U-M Athletics should prioritize the highest-emitting areas, including food service contractors, sporting and athletic goods manufacturing and landscaping services. Food service contractors represent 21% of the category emissions and are driven by activities including catering, food and beverage, and concessions services at athletic events. Landscaping services contribute roughly 9.6% to category emissions, encompassing activities such as turf maintenance and lawn care. Although not directly related to U-M Athletics, U-M has taken steps to reduce emissions from landscaping activities, notably with custodial and ground services purchasing battery-powered lawn and landscape equipment to replace existing fossil-fuel-based equipment.⁹ Sporting and athletic goods manufacturing accounts for 7.6% of category emissions, and it includes various products and equipment for training, competition and overall athletic operations. This includes but it is not limited to sports equipment, athletic apparel, protective gear and training and strength equipment.

2. Waste Generated in Operations (GHG Protocol Category 5)

Emissions in this category are measured by calculating the waste collected from each athletic building. Waste emissions were evaluated at 26 different facilities in the Athletic Department.

Waste data	FY 21-22	FY 22-23
Compost emissions (MTCO ₂ e)	30.6	31
Recycling emissions (MTCO ₂ e)	25.6	30.5
Landfill emissions (MTCO ₂ e)	178.8	205.9
Total emissions (MTCO ₂ e)	235.1	267.3

From FY22 to FY23:

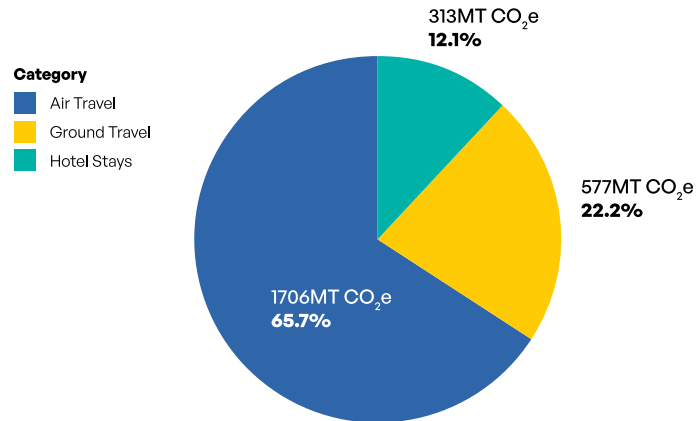
- Landfill emissions: 13.13% increase
- Recycling emissions: 15.81% increase
- Compost emissions: 1.08% increase

3. Business Travel (GHG Protocol Category 6)

Business travel contributed 2,596.22 MT CO₂e of emissions in FY23. Within business travel, three prominent subcategories were found:

- Air travel
- Ground travel
- Hotel lodging

Figure: Business travel CO₂e emissions by subcategory (air travel, ground travel and hotel stays).



Air travel makes up the majority (65.7%) of business travel emissions, totaling 1,706 MT CO₂e.

Length of Trip	Amount of Times Traveled
Short-distance trips (< 300 miles)	335 (18%)
Medium-distance trips (> 300 miles and < 2300 miles)	1,488 (73%)
Long-distance trips (> 2300 miles)	80 (4%)

Table: Frequency of FY23 trips by flight distance category. Explains the percentage breakdown of individual flight distances for the total routes U-M Athletics traveled in 2023, the total number of trips traveled being 1,923.

Our research identified that the high emissions in this subcategory are driven by a high concentration of medium-haul trips and indirect long-distance flights (multiple stops were taken within long-distance flights). Our analysis suggests that, in many instances, direct flights and/or more frequent use of ground transportation when possible could significantly reduce emissions. Although cost constraints make it difficult to always choose direct flights, increasing ground transportation use and leveraging Michigan’s sustainable aviation fuel partnership with Delta Air Lines can help address this challenge.

Flight Path	Total Miles	Total Emissions MTCO ₂ e	If Indirect, % More Emissions than Direct
DTW › LAX	1979	0.257474431	
DTW › SLC › LAX	2242	0.291691599	+ 13.29% emissions
DTW › ATL	524	0.07728136	
DTW › STL › ATL	924	0.120215449	+ 55.57% emissions

Table: Common U-M Athletics flight paths and their resulting emissions. Direct and indirect flights to the same destination are included to show the emissions increase resulting from multi-flight trips.

Ground travel is the second highest-emitting subcategory of business travel (522 MT CO₂e), driven by car and motor coach travel. Rail travel—a lower-emission ground transit option—was used too infrequently to lead to notable emission reductions. Opting for rail travel when possible in place of a car or motorcoach would reduce emissions, as rail travel produces .00021 kg CO₂e per dollar compared to .000499 kg CO₂e by motor coach.¹⁰

The methodology marks a key difference between ground and air travel data. Air travel was analyzed with a distance-based method, and ground travel was analyzed using a spend-based method. A distance-based method produces more accurate emissions data.¹¹ Therefore, detailed records of distances traveled by ground travel would provide more accurate emissions calculations.

Landscape Assessment

Key findings are presented below from the sustainability rating system our team created (see Methodology).

1. Trends Across Power 5 by Conference

The Pac-12 is the leading conference in terms of an averaged total score of the seven categories (1.7).

The Big 10, which includes U-M Athletics, ranked third among the conferences (1.52).

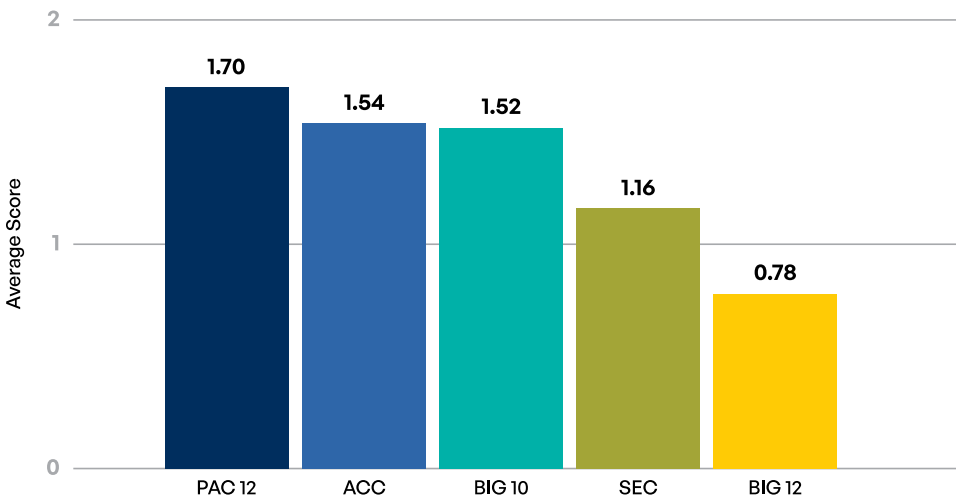


Figure: Average total score by conference. The value was derived from averaging the composite scores of all universities within a conference.

Both the Pac-12 and the ACC currently host annual conferences related to sustainability, the Pac-12 Sustainability Conference and the ACC Sports Sustainability Conference.¹² The Pac-12 and the ACC had the two highest conference averages of the Power 5 conferences, indicating a correlation between conference-wide initiatives and higher conference ratings for our landscape assessment. A similar Big 10 conference-wide initiative could strengthen sustainability within Big 10 athletics.

The data also reveals that no conference average total score was higher than 2 on a 0-3 possible scale. This shows great room for improvement at a conference level, particularly with major realignments in the 2024-25 athletics season, with much of the Pac-12—our data’s top sustainability performer—shifting into the Big 10.

2. Trends Across Power 5 by Individual School

The University of Colorado Boulder (UC-Boulder) ranks first among all the universities (2.57), boosted by its athletics-program-specific climate goals; it scores a 3 in this category on a 0-3 scale. Most programs, including U-M Athletics, do not have this level of strategic planning clearly outlined. UC-Boulder Athletics is also a signatory to the UN Sports for Climate Action; it is the first intercollegiate athletic program to sign on and adhere to the UN Sports for Climate Action guiding principles.

Within the 15 top-scoring Power 5 athletics programs, 10 are from the Pac-12 and ACC (5 and 5 respectively), 4 are from the Big 10, and 1 is from the SEC; none are from the Big 12. U-M Athletics’ score is ranked behind 13 other university programs, with many universities tied at higher scores. Given similarities among high-ranked programs and the large ranking ties, U-M Athletics has a unique opportunity to make pivotal changes and step ahead of many programs.

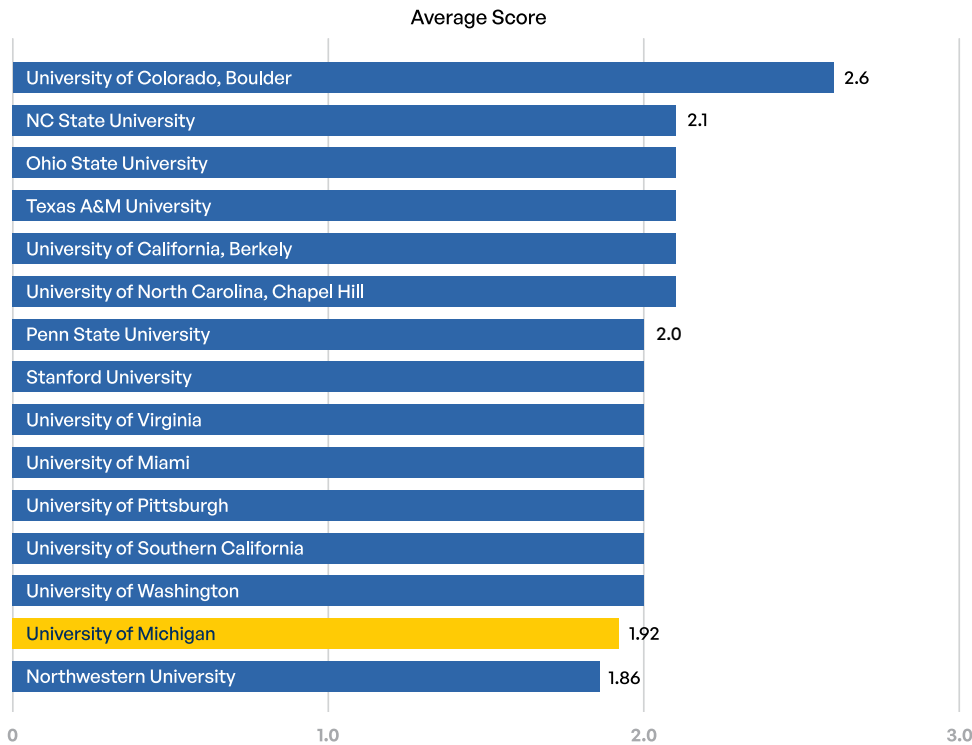


Figure: Fifteen top-scoring university athletics programs based on average total score. The University of Michigan is highlighted in yellow, showing its performance behind 13 higher-scoring programs. UC-Boulder has the highest individual average score.

In analyzing the universities with the lowest scores, only five universities average below 0.50, and 14 universities average below 1.00. Most of these schools were located in the Big 12 and the SEC, showing regional differences in sustainability efforts.

3. Trends Across Big 10 Conference by Individual School

The Big 10 conference average score is higher than the Power 5 average. In the Big 10, 8 out of 14 schools scored above 1.5, and 9 scored above the NCAA-wide average of 1.34.

Ohio State had the highest average score within the Big 10 at 2.14. Iowa and Purdue tied for the lowest score in the conference at 1.00.

The highest-scoring category on average was university-wide sustainability goals at 2.85. Only the schools with the lowest conference-wide average, Iowa and Purdue, scored below a 3 in this category.

The lowest-scoring category on average was athletic-department-specific sustainability goals at 0.38. Nine out of 14 schools scored a 0 in this category, with no school scoring above a 1. Outlining athletic-department-specific sustainability goals should be one of the first steps in driving change within athletics; this low ranking indicates a conference-wide need for greater attention toward varsity athletics sustainability in general.

4. The Big 10 vs. the Power 5

The Big 10 outperformed the Power 5 conference average in all seven of our categories except for athletic department sustainability initiatives. The highest positive difference in this area was within university-wide sustainability goals, where the Big 10 scored 0.51 points higher than the Power 5 average. The negative discrepancy exhibited within the athletic department sustainability initiatives was 0.10 below the Power 5 conference national average.

Overall, the Big 10 is leading the Power 5 conferences in adopting university-wide sustainability goals and other sustainability-focused actions. However, the Pac-12, ACC and SEC have seen greater engagement from their athletic departments, leading to more concrete goals and stronger initiatives.

5. University of Michigan vs. Ohio State University

Ohio State’s average score of 2.14 was 0.21 points higher than U-M’s average score of 1.93.

Ohio State scored higher than U-M in one category: student-athlete or athletic-department-driven initiatives. Ohio State has the Leadership of Environmental Athletes for Sustainability (LEAFS) cohort, which provides opportunities for student-athletes to create positive, sustainable changes within their team.¹³ Meanwhile, U-M lacks any student-athlete initiatives that focus on sustainability in sports.

U-M scored the same as Ohio State in the remaining six categories.

	University of Michigan	Ohio State
University-wide sustainability goals?	3	3
AASHE Sustainability Tracking, Assessment & Rating System (STARS)?	3	3
University-wide sustainability personnel?	2	2
Athletic-department-specific sustainability goals?	1	1
University-wide GHG emissions data?	1	1
Student-athlete or athletic-department-driven initiatives?	1.5	3
Waste management initiatives: athletic department?	2	2
Averaged Total Score:	1.93	2.14

Recommendations

Following a comprehensive analysis of Scope 3 emissions and a collegiate landscape assessment, coupled with broad stakeholder input, the team has developed six strategic recommendations to advance sustainability within U-M Athletics:

High-level recommendations:

- 1. Short term**
Support a student-led, student-athlete/Erb Undergraduate Fellows student organization focused on advancing sustainability within U-M Athletics
- 2. Long term**
Create dedicated personnel within U-M Athletics to focus on department sustainability

Key recommendations—Scope 3 emissions management:

- 3. Improve data management/tracking for business travel, waste and procurement**
- 4. Create partnerships between U-M Athletics and external stakeholders (such as key suppliers) to promote sustainability**
- 5. Increase collaboration between the Office of Campus Sustainability and U-M Athletics**

Key recommendation—Landscape assessment:

- 6. Align sustainability initiatives sponsored by U-M Athletics with those of key competitors (Ohio State University, Big 10)**

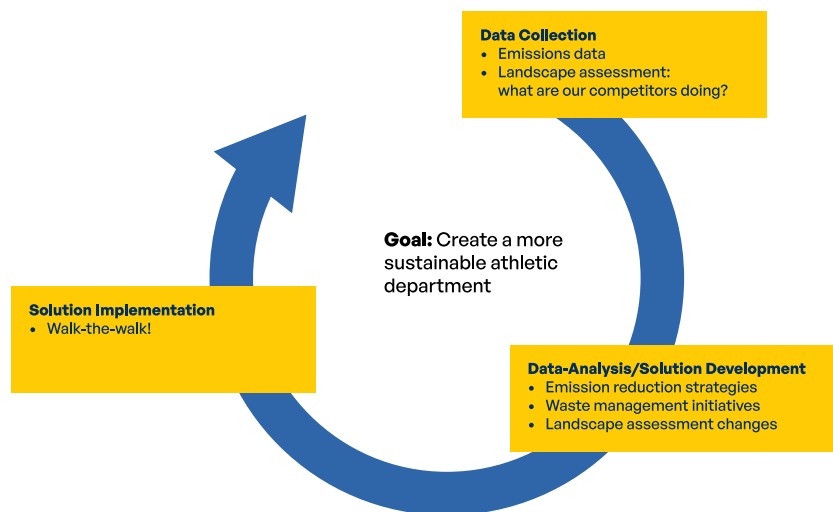
Further information about these recommendations is below.

- 1. Support a student-led, student-athlete/Erb Undergraduate Fellows student organization focused on advancing sustainability within U-M Athletics.**

Our team aims to pave the way for future student engagement in sustainability within U-M Athletics. The department will face increased pressure to expand sustainability initiatives in response to U-M’s carbon neutrality commitments. By partnering with the Erb Undergraduate Fellows program and its developing expertise, we believe U-M Athletics can draw from student-athlete perspectives to map out the best path forward.

A student-led, student-athlete/Erb Undergraduate Fellows organization would allow our research team to implement and build on our findings in a cyclical system of data collection, data analysis, solution development and implementation. This club aims to fulfill several important functions within this framework, including U-M Athletics Scope 1, 2 and 3 emissions tracking and implementing sustainable initiatives to make U-M Athletics greener. This club will integrate the passion of sustainability-minded U-M student-athletes and Erb Undergraduate Fellows with the expertise of students, OCS staff, athletics officials and Erb faculty to achieve these actions. Also, students and faculty involved in the club will serve as a go-to resource for various U-M administrators making decisions on sustainability for U-M Athletics.

Student-athlete/Erb Undergraduate Fellows student organization surrounding sustainability



2. Create dedicated personnel within U-M Athletics to focus on department sustainability.

Our team laid important groundwork to further sustainability within U-M Athletics; however, the project’s scope was constrained by data limitations and a need for greater insight into Athletic Department operations. The necessity for consistent data collection, recording and analysis underscores the importance of establishing a permanent role dedicated to operational sustainability within U-M Athletics. As Shana Weber, Associate Vice President of Campus Sustainability, begins to roll out a campus-wide climate action plan that includes U-M Athletics, we advise appointing dedicated sustainability personnel to work closely with the Athletic Department. Key responsibilities include collecting and evaluating GHG inventory data to track U-M Athletics progress toward net zero, in tandem with designing targeted sustainability initiatives to address high-emitting areas of athletics.

A dedicated role serves as a bridge between the OCS and U-M Athletics, along with robust support from the emerging student-athlete/Erb Undergraduate Fellows student organization surrounding sustainability. This collaboration blends academic and industry experience with a unique athletic perspective, which can build real momentum and secure university-wide support to position U-M as the leading sustainable athletics program in the nation. Our project team hopes that U-M Athletics also recognizes this opportunity and includes our foundational work in developing this new role.

3. Improve data management for the analyzed GHG Protocol categories

Due to data limitations, specific assumptions were made in our methodology. To accurately track Scope 3 emissions, U-M Athletics must enhance its data collection and management processes:

Purchased Goods and Services:

U-M Athletics provided the first 50 supplier good/service descriptions, and our research team filled in the remaining supplier descriptions to align with the EPA’s supply chain emission factors. Our team’s product/service descriptions, which were based on public data, may be prone to inaccuracies and misclassifications. Due to the vast number of suppliers, the Athletic Department could not verify our generated descriptions. Improving data accuracy begins with using detailed descriptions of products and services provided by contracted suppliers. This will ensure more accurate alignment with the EPA’s supply chain emission factor database, which includes over 1,000 goods and services in the U.S economy.¹⁴ The next step involves transitioning the emissions calculations from a spend-based method to a combination of secondary data using average

data and spend data. The spend-based method provided a high-level assessment of carbon hotspots within U-M Athletics procurement, but it lacks accuracy and specificity. The average-data method improves product/service-level emission accuracy by using relevant units of goods or services purchased, backed by life cycle assessment data. Where applicable, the number of units of purchased goods or services (such as kilograms, hours spent, kWh) should be used, with spend data filling in the gaps.

Examples for U-M Athletics include:

- **Food service contractors: Quantities of each type of food/beverage purchased (such as number of hot dogs)**
- **Sporting and athletic goods manufacturing: Units of athletic goods purchased, categorized by material (number of cotton shirts)**
- **Landscaping services: Square yards of sod/turf purchased**

Waste Operations:

The collection and disposal of all nonhazardous waste and recyclable materials at U-M Ann Arbor are operated internally through U-M’s Waste Management Services, a unique advantage to U-M, as many U.S. universities depend on external contractors for waste management. This, in turn, streamlined the emission calculation process, since the waste data was already organized by building and waste stream. To further enhance the accuracy and quality of waste data, we recommend transitioning from an average-data method to a waste-type-specific method.

A waste-type-specific method involves identifying the type of waste disposed of (plastics, food waste) and the waste diversion method (incinerated, landfilled, recycled, wastewater). U-M periodically conducts detailed waste audits on select buildings. For instance, in dining locations, compostable disposables were estimated to account for 10% to 20% of the waste by weight, while organics (food waste) make up 80% to 90%.¹⁵ More periodic waste audits can provide insights into waste types for select buildings, aiding in emissions calculations.

Business Travel:

U-M Athletics should improve data tracking for ground transportation and hotel stays by reporting distances in miles for ground travel, recording the type of vehicles traveled and tracking the total number of nights per individual trip. These tracking enhancements can improve the existing calculations, which relied on assumptions including a standard hotel night “price” and a standardized average emission factor for all vehicles traveled. The granular detail in travel logistics can improve the accuracy of emission calculations.

4. Create partnerships between U-M Athletics and external stakeholders (such as key suppliers) to promote sustainability

Purchased Goods and Services:

Sodexo, which represents nearly 80% of U-M Athletics’ spend on food service contractors, is a central figure in managing catering, food and beverage, and concession services across all athletic venues. To achieve substantial emission reductions, Sodexo and U-M Athletics launched a sustainability partnership program, ensuring all food and drink items are served in recyclable or compostable packaging.¹⁶ While other U-M Athletics suppliers implement their own sustainability initiatives, Sodexo remains the sole supplier that has an established sustainability partnership program with U-M Athletics. Our review of U-M Athletics’ major suppliers reveals that many are already committed to sustainability practices (such as food donations, recycled material in athletic gear and enhanced efficiency fertilizers). We recommend evaluating both existing and prospective suppliers for their sustainable offerings, with an eye toward developing new sustainability partnerships with U-M Athletics. Examples include:

- **Nike’s online store offers select Michigan merchandise made with at least 20% sustainable material, incorporating a blend of recycled materials.¹⁷ We propose a strategic partnership program that amplifies Michigan and Nike’s commitment to sustainability across their distribution channels. This initiative includes expanding the sustainable product line available under Michigan Athletics, incorporating more recycled material in athlete uniforms, and raising awareness of the sustainable product range through marketing campaigns.**

- U-M Athletics can partner with food service contractors to introduce more plant- or vegetable-based alternatives (such as Beyond Meat and Impossible Foods) in athletic venues. This measure would reduce U-M Athletics’ carbon footprint from food, as a 2022 study in the American Journal of Clinical Nutrition found that just one meal substitution from beef could reduce a person’s carbon footprint for that day by almost half.¹⁸

Business Travel:

The University of Michigan and Delta Air Lines have formed a partnership to promote the use of sustainable aviation fuel (SAF), making U-M the first university to partner with Delta on a SAF agreement.¹⁹ U-M Athletics uses Delta as its travel provider and under this partnership, U-M is able to reduce life-cycle GHG emissions from university-sponsored travel. We believe this type of partnership could be applied to other areas of business travel. For example, the U.S. Department of Transportation’s new fuel efficiency standards provide an opportunity for U-M Athletics to ensure ground transportation partners meet these standards.²⁰ Also, U-M Athletics can select more sustainable hotels for team trips by complying with green building standards (such as LEED).

Waste Operations:

Building on new and existing partnerships like the one with Sodexo, U-M Athletics can improve composting/recycling efforts and develop circularity within the program.²¹ Strategies include sourcing aluminum cans for water on game days, minimizing plastic items sold at concessions, and implementing a circular waste cycle that supports the resale and reuse of athletic gear and apparel.²²

5. Increase collaboration between the Office of Campus Sustainability and U-M Athletics

Considering U-M Athletics’ detailed understanding of its internal operations and OCS’s campus-wide sustainability targets, their collaboration is crucial for developing an effective Scope 3 emissions reduction strategy.

Business Travel:

Planning business travel is an area where U-M Athletics and OCS can collaborate to reduce emissions. With the Big 10 conference expanding coast to coast, a considerable number of long-haul flights and their associated emissions are expected. U-M Athletics and OCS can determine the most efficient, low-emission routes. Tracking the aforementioned sustainability standards (recommendation 4, Business Travel) for travel, as well as calculating low-carbon, multi-modal travel routes, provides opportunities to cut travel emissions while supporting student-athletes.

Waste Operations:

Previous waste collaborations between OCS and U-M Athletics have seen remarkable success. The Compost Pilot Program, in partnership with the Campus Farm at Matthaei Botanical Gardens, achieved a football game-day waste diversion rate exceeding 75%, with the compost being used to grow food for campus consumption. In addition to football, U-M Athletics has successfully hosted zero-waste pilot events for men’s soccer, women’s field hockey, men’s basketball and wrestling.²³ A major milestone was also reached with men’s gymnastics hosting the first-ever “zero-waste” NCAA Championship.²⁴ Building on these accomplishments, U-M Athletics and OCS should continue to implement zero-waste events across different sports. And as new waste challenges emerge, the Athletic Department can work with OCS to address them. In February 2024, U-M Athletics introduced alcohol sales at Yost Ice Arena and Crisler Center, with Michigan Stadium following in the fall. As the rollout of alcohol sales adds more waste, we recommend a new waste pilot initiative: implementing a reusable beer cup scheme modeled after the one used in the Tottenham Hotspur stadium.²⁵

Purchased Goods and Services:

U-M encourages sustainability in its procurement practices through advocacy, though currently, there are no mandatory policies in place. Departments are encouraged to select sustainable goods and services, and suppliers are asked a few sustainability-related questions during the competitive bidding process.²⁶ The main goal in the competitive bidding process, however, is to ensure that goods and services are secured at best value. We believe there is an opportunity for OCS and U-M Athletics to procure goods and services at fair value that also advance sustainable practices. Through the zero-waste game-day initiative at Michigan Stadium, for instance, U-M and Centerplate (U-M’s food service management company) effectively led third-party vendors to change packaging and products to compostable options.²⁷ A unified effort from OCS, U-M Athletics and Procurement Services can place greater emphasis on vendor sustainability practices and products within the procurement process, particularly in high-emitting areas. To support this effort, the supplier questionnaire should include more detailed questions on sustainability practices, helping OCS and U-M Athletics identify gaps and potential opportunities with suppliers.

6. Align sustainability initiatives sponsored by U-M Athletics with those of key competitors (such as Ohio State University and the Big 10)

Although U-M achieves moderate scores across several categories in our team’s rating system, adopting best practices from other universities could improve its performance. Our team determined U-M’s key competitors to align efforts with those in the Big 10 (updated to the 2024-2025 academic year). U-M Athletics has a great opportunity to expand sustainability initiatives and competitively strive for “Leader and Best” in the new Big 10. Our research team recommends the following:

- U-M Athletics should set goals to achieve zero-waste game days for all sports. U-M has sponsored zero-waste initiatives at several sporting events, including gymnastics, soccer, basketball, field hockey, wrestling and football games. However, U-M has not yet reached the milestone of a fully zero-waste game. In comparison, the University of Southern California, an incoming Big 10 member and a key competitor, has successfully implemented a zero-waste game-day initiative for football, with a 91.3% diversion rate²⁸ ([see data](#)). One approach is to launch a Big 10 Zero Waste Challenge; drawing from the Pac-12’s Zero Waste Challenge initiative, the competition among sports rivals can incentivize greater collective efforts to achieve zero waste.²⁹ Beyond games, U-M Athletics can also sponsor campaigns to reduce overall waste generated by the department. A team of current U-M student-athletes launched The SunBundle³⁰ in 2023, a 501(c)3 nonprofit dedicated to providing wellness care packages to people in need by upcycling used U-M athletic gear. The Athletic Department can take a hands-on approach to sponsoring similar innovative initiatives. U-M’s goal to “reduce waste sent to landfills by 40 percent and to strengthen the culture of sustainability on campus”³¹ by 2025 should drive additional internal incentives for U-M Athletics waste reduction efforts.
- U-M Athletics should set internal, long-term sustainability goals that are in line with the university’s broader climate action road map. Now is the ideal time to prioritize this, as new executive leadership for climate and campus sustainability begins to coordinate sustainability efforts across U-M into an integrated climate action plan. U-M Athletics plays a significant role in the university’s broader commitments. Setting long-term internal goals ensures robust accountability, promotes sustainability awareness among high-level personnel and sets the stage for more ambitious future targets as short-term projects are initiated.

Conclusion

This report showcases the focused efforts of our Erb Undergraduate Fellows Impact Team over the past year. Our mission was to establish a baseline emissions assessment for high-emitting categories within U-M Athletics’ GHG inventory and to create data-driven recommendations for operational sustainability. Although our initial calculations offer valuable insights, more work is needed to fully account for U-M Athletics’ entire GHG inventory. From a conference-wide perspective, the landscape assessment demonstrates that U-M Athletics is showing strong results, yet with forthcoming conference changes that will dramatically alter the collegiate landscape, plenty of sustainability challenges lie ahead. Our recommendations aim to address these complex challenges, and we look forward to continuing our support of the Athletic Department’s sustainability efforts.

Appendix

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