

SNAPSHOTS

The collegiate sports greening movement is now so widespread that it is impossible to feature all of the impressive environmental initiatives undertaken at campus athletics and recreation departments. Below are 20 “snapshots” of noteworthy collegiate sports greening successes that demonstrate the reach of this movement.

PENN STATE UNIVERSITY, HOME OF THE NITTANY LIONS

FIRST LEED-CERTIFIED BASEBALL STADIUM IN THE UNITED STATES

Since 2006, Penn State has been designing to LEED standards, beginning with Medlar Field at Lubrano Park, the first U.S. baseball stadium to be awarded LEED certification. Penn State Athletics’ green building practices include retrofitting campus gyms and athletic buildings with energy-efficient lighting and other energy efficiency improvements. “Maintenance improvements and energy savings were the driving force for these projects; better lighting and noise reduction were an added plus,” says Mark Bodenschatz, Associate Athletic Director, Penn State Athletic Facilities & Operations. These changes have cut electricity use across many athletic facilities, including a savings of 57 percent at the indoor swimming pool, 21 percent at the football practice field, 25 percent at the multisport complex, and 13 percent at the White Building fitness complex from lighting retrofits alone. Penn State’s new ice rink, set to open in fall 2013, is expected to consume 18 percent less energy than an average campus building. Penn State anticipates that the rink will achieve LEED Gold certification.

All Penn State sports facilities have used environmentally preferable cleaning products and processes since 2008, contributing to better air and water quality. Recycling bag dispensers in tailgating areas and a growing in-stadium recycling program have helped the 111,000-seat Beaver Stadium reach a 35 percent waste diversion rate and save Penn State \$12,500 in litter cleanup costs after every home football game. The Lions divert 85 tons of materials to recycling at each game and donate all proceeds to the United Way, with such proceeds topping \$85,000 since 1995. The impetus for these programs, according to football head coach Bill O’Brien, is to be a strong community role model. “Sustainability is a great way to lead our community, and we all have a role to play,” he says.

To help identify additional sustainability options, Penn State Athletics created a Green Team staff committee in early 2013 to help reduce the department’s environmental footprint. The 14-member team includes the director of athletic facilities, facilities managers, coaches, and student-athletes. The Green Team is working to include more student-athletes to provide them with educational and professional development opportunities. Women’s soccer head coach Erica Walsh says, “As leaders in our community, it is vital for us to seek educational opportunities in the discipline of sustainability for our staff and student-athletes. It is critical that we do our part to help continue the positive momentum of this movement and effect change both on and off the field.”

“AS LEADERS IN OUR COMMUNITY, IT IS VITAL FOR US TO SEEK EDUCATIONAL OPPORTUNITIES IN THE DISCIPLINE OF SUSTAINABILITY FOR OUR STAFF AND STUDENT-ATHLETES,” SAYS WOMEN’S SOCCER HEAD COACH ERICA WALSH. “IT IS CRITICAL THAT WE DO OUR PART TO HELP CONTINUE THE POSITIVE MOMENTUM OF THIS MOVEMENT AND EFFECT CHANGE BOTH ON AND OFF THE FIELD.”

Photos courtesy of Penn State University.



UNIVERSITY OF TEXAS, HOME OF THE LONGHORNS

RECYCLING AND COMPOSTING LEADER

University of Texas (UT) Athletics first adopted more sustainable stadium operations in 1996. What started as a plastic container recycling effort on football game days has evolved into a campus-wide collaboration that includes recycling, composting, and other forms of resource conservation. “We want to continue to get better at reducing our carbon footprint during events and daily operations,” says Merrick MyCue, UT assistant athletics director for stadium operations.

In 2008, UT Athletics began to explore additional ways to reduce resource use and associated operations costs. “Through renovation and preventive maintenance as well as behavior change within each department, Athletics has reduced its annual utility expenditures by 15 percent,” says Jim Walker, director of sustainability on the UT campus. “The greatest savings have come from reducing water costs, which is very important in a state in the midst of a severe drought.”

Since 2009 UT Athletics has been enhancing DKR–Texas Memorial Stadium’s environmental profile. In early 2009 the department installed an artificial playing surface that lasts longer than natural turf, requires less maintenance, and saves 3 million gallons of water annually as well as 700 gallons of paint. UT also installed energy-efficient lighting. Beginning in 2011, UT Athletics teamed up with Keep Austin Beautiful to launch a composting program on football game days. In its second year, the program collected 16,600 pounds of compost. Forty-three tons of plastic were also collected for recycling during the 2012 football season, saving 141 cubic yards of landfill space and the equivalent of 16,235 gallons of oil and 299,068 gallons of water.

“UT ATHLETICS IS LEADING THE WAY BY ENGAGING EMPLOYEES, STUDENT-ATHLETES, AND FANS,” SAYS JIM WALKER, DIRECTOR OF SUSTAINABILITY. “AS A UNIVERSITY, WE ARE WORKING ON INTEGRATING SUSTAINABILITY INTO ALL ASPECTS OF CAMPUS LIFE, AND ATHLETICS IS A MAJOR PART OF THAT.”

In 2013, UT Athletics assembled a Green Team with about 30 members representing nearly every sport and division within the department. The Green Team implements energy conservation, paper reduction, and battery recycling events. It also helps students develop sports greening projects. “UT Athletics is leading the way by engaging employees, student-athletes, and fans,” says Walker. “As a university, we are working on integrating sustainability into all aspects of campus life, and athletics is a major part of that.”

UNIVERSITY OF CALIFORNIA, LOS ANGELES, HOME OF THE BRUINS

LEED GOLD SPORTS FACILITIES

UCLA boasts 109 NCAA championships and huge student participation in a wide variety of recreation programs. “Sports and recreation are a central part of life at UCLA for students and staff,” observes chief sustainability officer Nurit Katz. “Health and sustainability are inextricably linked, and the greening of sports is critical to creating a healthy and sustainable campus.”

According to Mick Deluca, executive director of recreation and campus life, “UCLA is taking an integrated, campus-wide approach to sports greening.” The Pauley Pavilion arena, which is anticipating LEED Gold certification in 2013, is designated as a “zero waste” operation, helping contribute to UCLA’s broader “zero waste” goals. The Spieker Aquatic Center, an outdoor 50-meter swimming pool and diving complex, received LEED Gold status in 2012, and the renovation of 13,000 square feet of existing space on campus into the Kinross Recreation Center, completed in July 2012, is also expected to receive LEED Gold certification. The recreation and athletics departments also collaborated with UCLA’s facilities division and a local gas company in winning a grant to pay for covers for the university’s five outdoor swimming pools, which reduced the cost of heating the pools by 34 percent.

Another example of interdepartmental collaboration on sports greening is the Community Bike Shop, launched jointly by the UCLA transportation and recreation departments. The Bike Shop, which is promoting an ecologically preferable form of transport, offers self-service bike repair stations as well as bike rentals, loaner bikes, and bike-sharing programs. Other recreation facility projects include the installation of low-flow showerheads and self-powered exercise equipment funded through the Green Initiative Fund (TGIF), a student grant fund for sustainability. Students taking courses at the Institute of the Environment and Sustainability have formed Action Research Teams to implement sustainability projects including athletic facility lighting improvements, recycling enhancement at sports venues and events, and a community garden with a rain catchment station at UCLA’s Sunset Canyon Recreation Center.

UNIVERSITY OF PENNSYLVANIA, HOME OF THE QUAKERS

STUDENT-ATHLETE ECO-REPS

Penn's Athletics Eco-Reps team, comprising 13 student-athletes at its launch in September 2012, is part of Penn's Green Campus Partnership, which works throughout the university to promote better environmental practices and policies. The team is led by Dan Schupsky, assistant swim coach and pool facilities manager, with support from staff members in Penn's sustainability and athletic departments. "The Eco-Reps act as an internal consulting group that researches how each team can be greener," says Schupsky. "we also plan to tackle issues related to Penn's recreation facilities."

The Athletics Eco-Reps develop programs that help Penn's sports teams and facilities adopt more sustainable practices. Each Eco-Rep chooses an environmental topic to research and then formulates practical solutions to help improve the environmental impact of Penn Athletics' operations. Topics that Eco-Reps have focused on include energy conservation in Athletics facilities, waste and recycling practices among athletes, water conservation strategies, alternative transportation, and environmental education. "Identifying issues and benchmarking were crucial to getting the program off and running," says Athletics Eco-Rep and gymnast Sara Allen, class of 2015.

The Athletics Eco-Reps team is a fundamental part of Penn's overall sports greening efforts, which also boast an impressive LEED Gold weight training center in Weiss Pavilion, a 24-acre urban park, athletics facility, and former brownfield site in Penn Park; and Shoemaker Green, a 2.75-acre public commons that is a pilot for the American Society of Landscape Architect's Sustainable Sites Initiative. "Prospective varsity athletes have expressed enthusiasm and admiration for Penn's Athletics EcoReps program," says Schupsky. "As the program evolves, it could potentially be used as a recruiting edge for attracting a well rounded student athletes."

One example of a successful recruiting tool has been Penn's ultraviolet (UV) pool disinfection system, installed by Penn's Department of Intercollegiate Athletics and Recreation in 2011. The UV system has reduced the concentration of chlorine in their pools by approximately 50 percent. "It has dramatically improved the air and water quality and directly benefits the health of our athletes," says Schupsky. "We've seen a marked decline in respiratory health issues among our swimmers since decreasing the chlorine concentration. It directly benefits our varsity athletes' ability to train at a high aerobic level as healthier athletes allows for more consistent training and better results in the long-term. So it's no surprise the UV system is a great draw during recruiting—parents and athletes ask about the indoor air and water quality of our facility all the time."

Also in 2011, student volunteers helped staff Penn's first "zero waste" basketball game. The students worked with Penn Athletics to replace trash cans with composting and recycling bins and partnered with the stadium's vendors to switch to compostable or recyclable serviceware.



Photo courtesy of University of Pennsylvania.

BOWDOIN COLLEGE, HOME OF THE POLAR BEARS FIRST LEED-CERTIFIED HOCKEY ARENA IN THE UNITED STATES

Bowdoin College has taken a comprehensive approach to incorporating sustainability into sports operations. The college built the first LEED-certified ice hockey arena (the Watson Arena) in the United States in 2006. In fact, Bowdoin is home to two LEED-certified sports venues, the Watson Arena and the Buck Center for Health and Fitness. Bowdoin treats its athletic fields almost exclusively with organic fertilizer and has installed high-efficiency light fixtures at its basketball courts, track, and indoor tennis courts. Bowdoin is also implementing programs to transition to paperless sports operations, using Quick Response Codes, for instance, that can be scanned by smartphones.

“Partnerships between the athletics department, the sustainability office, and the facilities management department are critical to successful sports greening at Bowdoin,” says Bowdoin Green Athletes cofounder Alex Tougas, class of 2014. “Student sustainability groups are important for strengthening those partnerships.” Bowdoin Green Athletes, formed in the spring of 2012, is a group of student-athletes committed to developing and implementing projects to enhance the sustainability of sports on campus. The group includes an executive committee that manages student-athlete representatives from all 50 campus sports teams to help shift the culture toward supporting the college’s sustainability goals. “Our athletics department, campus community, and local environment have benefited considerably from the work completed by Bowdoin Green Athletes,” says director of athletics Timothy M. Ryan. “We seek to complement the sustainability efforts under way at the college and to promote environmentally conscious behavior by our teams and supporters at all of our athletics contests.”

Green Athletes operates numerous recycling initiatives at athletics contests, including participation in the Game Day Challenge at the homecoming football game in the fall of 2012, where they achieved an 82 percent waste diversion rate. Green Athletes achieved a waste diversion rate of 88 percent at a 2012 men’s basketball game with the help of fan education campaigns and added infrastructure. Other projects include on-campus speaker events and an athletic shoe recycling project, done in conjunction with the charitable organization “Rerun Shoes,” which supports micro-entrepreneurs in Liberia, Guinea, and Mali, among other locations in West Africa.

“OUR ATHLETICS DEPARTMENT, CAMPUS COMMUNITY, AND LOCAL ENVIRONMENT HAVE BENEFITED CONSIDERABLY FROM THE WORK COMPLETED BY BOWDOIN GREEN ATHLETES,” SAYS DIRECTOR OF ATHLETICS TIMOTHY M. RYAN. “WE SEEK TO COMPLEMENT THE SUSTAINABILITY EFFORTS UNDER WAY AT THE COLLEGE AND TO PROMOTE ENVIRONMENTALLY CONSCIOUS BEHAVIOR BY OUR TEAMS AND SUPPORTERS AT ALL OF OUR ATHLETICS CONTESTS.”



Photo courtesy of Bowdoin College.

UNIVERSITY OF CALIFORNIA, BERKELEY, HOME OF THE GOLDEN BEARS PLAY GREEN RECREATION CENTER

In 2008, UC Berkeley’s recreational sports department launched a Play Green initiative to showcase its efforts to reduce its ecological footprint and encourage recreational athletes to take greener actions. “We wanted to use our relationship with students to educate and inspire them, but also connect them with other sustainability groups on campus,” says Mike Weinberger, Berkeley’s director of recreational sports. “There are a lot of student sustainability groups at Berkeley, and we weren’t sure they were all talking to each other. We thought we could facilitate that by building a community that’s focused on green initiatives.”

“WE WANTED TO USE OUR RELATIONSHIP WITH STUDENTS TO EDUCATE AND INSPIRE THEM, BUT ALSO CONNECT THEM WITH OTHER SUSTAINABILITY GROUPS ON CAMPUS,” SAYS MIKE WEINBERGER, BERKELEY’S DIRECTOR OF RECREATIONAL SPORTS.

Weinberger first looked at how the recreation department could set a greener example for the campus. He started by asking, “What are we doing as a department? What are the things that we can do to save energy or reduce pollution?” He was able to save 25 percent of the Recreation Center’s energy use right away by rescheduling custodial work to take place during regular operating hours, allowing the building to go completely dark between its closing at midnight and reopening at 6 a.m. “Inevitably, there were complaints: ‘I’m working out and somebody’s mopping the floor next to me,’” Weinberger says. “We had to educate our users, explain what we were doing, the resource benefits, and kind of sell it.”

In March 2008, the Recreation Center upgraded Underhill Field with a new synthetic turf called Sprinturf, made with recycled rubber from used tires. Other green elements of the project included recycling the concrete from the demolition of the previous surface, reusing the soil excavated for the project to construct a playing field in West Berkeley, and reducing herbicides, paint, and water use.

Also in 2008, Berkeley upgraded the Recreational Sports Facility Field House lighting system to reduce energy use, lower maintenance costs, and provide better lighting in the gyms. Throughout the Field House, existing light fixtures were replaced with high-efficiency, high-output fluorescent lamps and transformers, which were equipped with occupancy sensors that switch off lights automatically when an area has been unoccupied for 20 minutes. The change also made good business sense because installing new lighting equipment is one of the quickest and least expensive ways to reduce electrical demand. Energy use was cut by 252,000 kilowatt-hours per year for a savings of \$25,000 annually. The total cost for the lighting improvement project was approximately \$114,000, 80 percent of which was covered by a grant from Pacific Gas and Electric. Thus, the net cost was \$23,000, which was recouped in less than a year. The reduction in energy use also removes the equivalent of 132,000 pounds of CO₂ per year from the air.

UNIVERSITY OF CALIFORNIA, IRVINE, HOME OF THE ANTEATERS

GREENER RECREATION CENTER DESIGN

In the spring of 1996, UC Irvine students voted to support the construction of the \$27 million Anteater Recreation Center (ARC) with a \$70 per-term student fee. The design committee for the 90,000-square-foot facility, managed by the department of campus recreation, prioritized sustainable design even before the U.S. Green Building Council developed the LEED certification program. By 2008, campus recreation was able to achieve LEED Gold certification for its 26,000-square-foot ARC expansion. One of the highlights of the expansion is a teaching kitchen, which is used to teach sustainable cooking to the university community. Other green features include 100 percent reclaimed water use for irrigation, a cool roof (using white paint to reflect heat from the sun and reduce cooling needs), recycled rubber flooring, variable frequency drives on all mechanical equipment, and existing building recommissioning.

In 2013, the ARC also became one of UC Irvine's first "zero waste" facilities, which involved installing recycling and composting bins throughout the facility. The facilities management recycling team provided training for department custodians. This initiative helped the ARC contribute to the University of California's system-wide goal of reaching "zero waste" by 2020.

Another campus sustainability program, sponsored by UC Irvine's departments of campus recreation, human resources, and environmental health and safety, is "Green Up." The program aims to raise the environmental awareness of faculty and staff and provide tips on greener living. It is part of an annual program to improve the well-being of the campus community. In 2012, 905 faculty and staff participated in the program, along with more than 1,700 students.



Photo courtesy of University of California.

HARVARD UNIVERSITY, HOME OF THE CRIMSON

SOLAR ARRAY ATOP TRACK AND TENNIS FACILITY

In June 2012, Harvard Athletics completed construction of a 2,275-panel solar photovoltaic system, the university's largest solar energy project to date, spanning 1.5 acres of roof space atop the Gordon Indoor Track and Tennis building. The project creates approximately 650,000 kilowatt-hours of electricity annually, enough to power more than 50 average homes, and reduces carbon dioxide emissions by approximately 500 metric tons annually. "Harvard Athletics is proud of this project and the many initiatives we've undertaken to help Harvard achieve its sustainability goals," says athletics director Bob Scalise.

The solar panels deliver electricity directly to Harvard's electrical grid to power lighting for athletic fields and nearby buildings. (The electricity produced and the solar panels themselves are owned by Harvard Athletics.) The solar power helps the university meet its obligations under the Massachusetts Renewable Portfolio Standard, which requires Harvard to buy a specified percentage of its electricity from renewable sources (15 percent by 2020). The solar project cost approximately \$2.1 million, with the majority of up-front installation costs covered by a university grant for green infrastructure upgrades. The \$80,000 to \$85,000 in projected annual savings will pay back the investment within approximately eight years. "Harvard Athletics is showing that sports and sustainability go hand in hand," says Heather Henriksen, director of the Harvard Office for Sustainability. "By building Harvard's largest solar project, the athletics staff are not only producing clean, renewable energy that will help us get one step closer to our goal to reduce greenhouse gas emissions, but they are also demonstrating a pragmatic approach to operations that will ultimately reduce costs."

"HARVARD ATHLETICS IS PROUD OF THIS PROJECT AND THE MANY INITIATIVES WE'VE UNDERTAKEN TO HELP HARVARD ACHIEVE ITS SUSTAINABILITY GOALS," SAYS ATHLETICS DIRECTOR BOB SCALISE.

The commitment to sustainability by Harvard Athletics also includes recycling at football games and in tailgating areas, creating a student-led recycling green team, installing occupancy sensors in sports facilities, and installing a cogeneration unit to heat water used in the pool and for showers at the Malkin Athletics Center complex. The cogeneration unit generates heat and electricity from a single power source, avoiding the production of 197 tons of greenhouse gases annually. "We have also installed multiple variable frequency drives in our sports facilities, including on our hot water and pool pumps," says Jason Waldron, assistant manager of operations for Harvard Athletics. "In 2013 we will replace our 700-watt arena fixtures with 358-watt LED fixtures at our basketball, hockey, and track and field arenas and our strength and conditioning facilities." This lighting upgrade involves replacing more than 150 fixtures and will save the athletics department an estimated 256,357 kilowatt-hours and more than \$32,000 each year.

WASHINGTON STATE UNIVERSITY, HOME OF THE COUGARS

AUTOMATED BIKE RENTALS

"There is tremendous student interest in cultivating the 'go green' spirit," says Kathleen Hatch, director of Washington State University's recreation department. "Because it is an institutional arm that reaches 85 to 95 percent of WSU students, the recreation department is a great place to model different practices." The department started a Wellbeing Program in 2006 to promote the critical role that a healthy environment plays in individual health. According to Erin Carroll, wellbeing coordinator at WSU, "In the same way that student interest in health and fitness has driven the recreation center development boom of the past 20 years, a growing concern among students about environmental wellbeing is now having a direct influence on how these facilities are run."

In 2010, the recreation department launched a "Green Bike" bicycle rental program with a fleet of 40 bicycles after first piloting the idea during 2009 with five bikes. The goal was to help reduce car use, decrease traffic congestion, reduce carbon emissions, improve student health through physical exercise, and increase awareness of sustainable methods of transportation. In the first year and a half of this program, 585 people used the bikes, checking them out 2,800 times and traveling a total of 12,000 miles. In 2012, students voted to continue to fund the program by approving a student fee for automated checkout stations and for the purchase of another 40 bikes. "Since September of 2010, the automated Green Bikes have been checked out over 43,000 times and we have had over 10,000 unique users," says Carroll. "We calculate that we have saved approximately 23.7 metric tons of carbon emissions relative to the use of passenger cars."

"THERE IS TREMENDOUS STUDENT INTEREST IN CULTIVATING THE 'GO GREEN' SPIRIT," SAYS KATHLEEN HATCH, DIRECTOR OF WASHINGTON STATE UNIVERSITY'S RECREATION DEPARTMENT. "BECAUSE IT IS AN INSTITUTIONAL ARM THAT REACHES 85 TO 95 PERCENT OF WSU STUDENTS, THE RECREATION DEPARTMENT IS A GREAT PLACE TO MODEL DIFFERENT PRACTICES."

University recreation used the success of the bike program to launch a "Crimson Revolution" campaign later in 2010. The campaign highlights the WSU Recreation Center's sustainability efforts and encourages students to pledge to adopt greener behaviors. "The Crimson Revolution is aimed at changing behavior and positively impacting our community," says Hatch. "We had students lining up to give their 'green pledge' at a back-to-school celebration... everything from pledging to buy local, walking to school, and riding a bike more often to considering fair-trade purchases." WSU's recreation department also leads by example; for instance, in 2010, it pledged to recycle at least 40 percent of the waste produced in the Rec Center, a diversion rate that it continues to reach annually. The center also committed to reducing office paper use by 15 percent in 2010 and exceeded that goal by a wide margin, cutting paper use by 45 percent in 2011. It established a goal of decreasing electricity consumption by 2.5 percent in 2010 and actually reduced it by 18.52 percent. It also saves \$6,000 annually in reduced energy costs thanks to upgrades to their washer and dryer system. The rec department also cut natural gas use by 21 percent in 2010 and cut paper towel use by 23 percent between 2010 and 2012.



Photos courtesy of Washington State University.

UNIVERSITY OF CONNECTICUT, HOME OF THE HUSKIES

FIRST LEED-CERTIFIED ATHLETIC FACILITY IN THE NCAA

The University of Connecticut's Burton Family Football Complex and Mark R. Shenkman Training Center became the NCAA's first LEED-certified building when it was completed in the summer of 2006. UConn Athletics achieved LEED Silver certification for the football complex by incorporating a variety of environmentally preferable features into the venue design. These include low-flow fixtures, native landscaping, locally manufactured building products, building materials made with recycled content, rain gardens, and highly reflective windows. The energy-efficient features have helped the facility cut energy use by 35 percent below 1999 ASHRAE standards, saving \$35,000 to \$40,000 per year. The water-efficient features have reduced the building's water use to a level 35 percent below EPA standards. The division of athletics agreed to cover the up-front cost premium of achieving LEED certification and today hosts green building tours for classes and outside groups.

According to Richard Miller, the university's director of environmental policy, more than three dozen features of the complex promote environmental sustainability, including site selection, building design, choice of construction materials, energy and water conservation, and indoor environmental quality. The university earned LEED points for using 7,000 cubic feet of peat excavated from the site to help restore and replace wetlands that were affected by the cleanup and construction activity atop the former UConn landfill. Steel with 100 percent recycled content was used in constructing the athletic facility, and the synthetic turf for the indoor field was made using recycled material. Ninety percent of regularly occupied spaces in the complex use natural daylight, which allows passive solar heating to reduce energy costs in the winter. Permeable pavement and bioswales around the facility also help clean stormwater and reduce runoff that might otherwise cause sedimentation, erosion, and flooding. As UConn's first LEED building, the football complex paved the way for a green building policy instituted in 2007 that requires all new university buildings to achieve a minimum of LEED Silver certification.

WILLIAMS COLLEGE, HOME OF THE PURPLE COW

HOCKEY RINK ENERGY USE CUT IN HALF

In 2009, Samantha Tarnasky (class of 2009) completed a senior project that identified ways to cut energy consumption in half at the Williams College hockey rink. "This project was great because it let us go after a big chunk at once," says Todd Holland, energy conservation project manager for the college's Zilkha Center for Environmental Initiatives. With support from a Zilkha Center internship program, Corey Benson (class of 2011) spent the summer of 2010 developing an implementation plan for Tarnasky's research proposal. The college hired Clark and Green Architects to design the renovations in partnership with Gary Guerin, associate director for athletics operations, the hockey and tennis coaches, the facilities department, and the staff at the Zilkha Center.

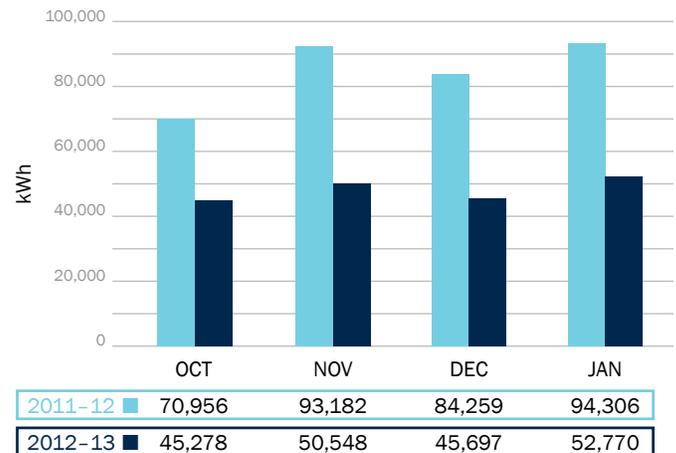
Coupling the energy upgrades with a broader renovation plan for the 60-year-old facility—including adding new locker rooms, flooring, and coaches' offices—was a major selling point for the athletics department. "They realized they could improve the performance of the facility and save thousands of dollars each year in utility costs," explains Stephanie Boyd, director of the Zilkha Center.

With all upgrades in place, the electricity savings from the first four months of 2013 came to 148,411 kilowatt-hours. Williams is on track to meet or exceed the estimated annual savings of 230,000 kilowatt-hours. Significantly, every energy-efficient decision that was made had a positive impact on the games played in the facility. "The improvements significantly improved air quality, the ice is smoother and more consistent, the building is colder, and the lighting is sharper," says Boyd.

"The first thing we noticed was the improvement to the lighting," agrees Mark Lyons (class of 2013), 2012-2013 men's hockey co-captain. "Quality lighting makes a huge difference in a high-speed game like hockey."

Next, Williams Athletics is pursuing LEED green building certifications, on-site solar, and improved waste diversion. "We will begin construction on a new football facility, which is targeted to be LEED Gold-certified," Boyd says. "We are exploring thermal solar or solar electric systems, or both, for the top of the gym and pool, and we are looking into a new dehumidification system for the pool." Through efforts of the athletics and grounds departments, the college has also been improving recycling infrastructure at athletic venues. Boyd explains that athletics projects are ideal for sustainability work because they engage both the student body and alumni supporters.

ICE RINK ELECTRICITY USE



"THE IMPROVEMENTS SIGNIFICANTLY IMPROVED AIR QUALITY, THE ICE IS SMOOTHER AND MORE CONSISTENT, THE BUILDING IS COLDER, AND THE LIGHTING IS SHARPER," SAYS STEPHANIE BOYD, ZILKHA CENTER DIRECTOR.

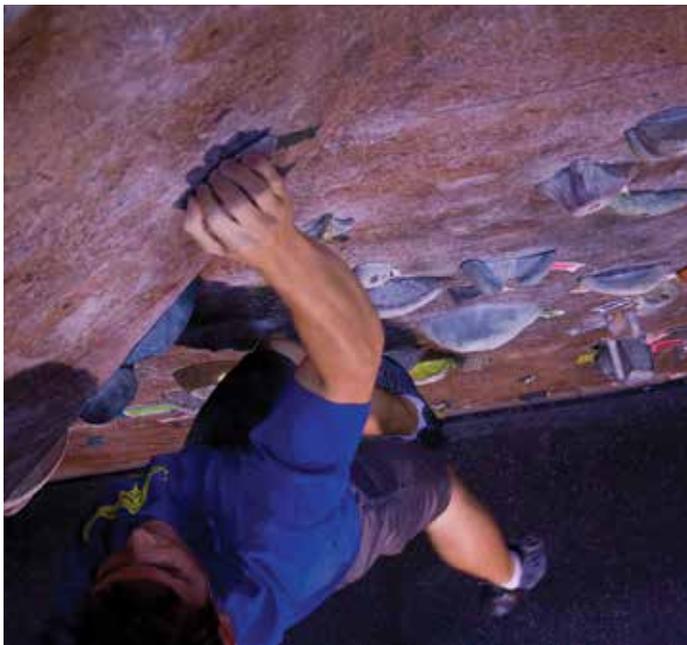
UNIVERSITY OF CALIFORNIA, SAN DIEGO AND SAN DIEGO STATE UNIVERSITY

LEED PLATINUM-CERTIFIED AQUATIC CENTER WITH ONSITE SOLAR

In 2007, San Diego State University (SDSU) and UC San Diego (UCSD) collaborated to install 5,000 square feet of thermal solar panels atop their co-owned Mission Bay Aquatic Center (MBAC) to heat the facility's 50-meter pool. The panels cost approximately \$100,000 and paid for themselves in energy savings in two years.

Also in 2007, SDSU installed 24-foot ceiling fans inside the school's 10-year-old recreation center to minimize air-conditioning costs. "Rec centers are not the most energy-efficient places in the world. We use a lot of electricity, we use a lot of water in bathrooms and showers, and we use a lot of air-conditioning," says Eric Huth, SDSU's recreation director. "Our building has a \$300,000 annual energy bill, and if I can reduce that by 10 or 15 or 20 percent, I can create a substantial savings for our budget."

The recreation department collaborates with an organization called the Associated Students of San Diego State, a student-led group that encourages campus sustainability efforts to be integrated into both infrastructure and operations. During the 2007 winter break, the recreation staff broke into groups of five to develop ways to mitigate the department's environmental impact. Ideas ranged from implementing greener cleaning polices to encouraging users to turn off entertainment monitors on cardio machines after use. This kind of thinking was in line with a campus-wide "Green Love Initiative" that seeks to encourage sustainable practices in all SDSU facilities. "We really got on board with the initiative and have been working since the 2008 fall semester to do as much as we can," Huth says. "I think there's been a tipping point in sustainability in the last couple of years, and it just seems like it's on everyone's agenda."



In May 2013, student-driven greening efforts helped foster a student-managed collaboration between SDSU and UCSD to achieve LEED Platinum certification (Existing Building, Operations & Maintenance) for the 40-year-old Mission Bay Aquatic Center. The certification for the facility was coordinated by only two staff members with the help of more than 30 student volunteers. The students from SDSU and UCSD (mostly members of SDSU's Green Love Committee or student chapters of the U.S. Green Building Council at both schools) completed most of the project planning over 12 months.

"Engaging the emerging generation in this mission is as important as the built environment we strive to improve," says Michelle Perez, a sustainability analyst at UCSD. "The students shared their talents, bringing fresh perspective to the project at every step. By engaging students in the MBAC LEED certification effort, both universities continue to green their schools from within." Glen Brandenburg, director of MBAC, adds that there is a strong business case for greener buildings, as well as an educational opportunity. "When we first built the MBAC we included a lot of design elements that were meant to have a long-term impact on keeping operating costs down," says Brandenburg. "And while our decision at the time was based on economics, the conservation aspects of the design features that are being implemented today have both an economic and ecological benefit. It's a win-win."

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Photos courtesy of NRS&A, San Diego State University



CORNELL UNIVERSITY, HOME OF THE BIG RED BEARS

ENERGY-EFFICIENT LIGHTS CUT COSTS

In January 2012, Cornell Athletics upgraded the lighting system at its Reis Tennis Center with new lights that deliver twice the brightness of the previous lighting and use 70 percent less energy. Lower energy costs from these lights save Cornell approximately \$20,000 per year. The old lights took a long time to warm up, so once they were turned on, they were left on. The new lights turn on and off quickly and are fitted with occupancy sensors that cover the six indoor courts. If there is no movement for 15 minutes on a court, the lights automatically shut off. The shutoff sensors not only save energy but lengthen the lifetime of the bulbs to an estimated seven years as compared with the previous bulbs' two-year life span. This saves Cornell \$2,000 annually in maintenance costs, since the new lamps do not need to be replaced as frequently as the old ones did.

The system, designed and installed by an energy services company called CleanTech Solutions, can be dimmed for moderate lighting during recreational use and turned on fully for varsity tournaments, which require brighter lighting for taping or TV. It also mixes direct and indirect light to reduce on-court shadows. "We went from the lowest to the highest light levels among Ivy League NCAA tennis facilities," says Marty Johnson, the tennis center manager, "and now others are following suit."

Cornell spent \$100,000 on this project but received a \$47,000 energy rebate from the New York State Energy Research and Development Authority, and the school expects that the improved lighting will pay for itself within three years. Cornell is now looking to install similar systems in other athletic facilities. "My hope is that we can parlay the success at Reis into an effort to retrofit more athletic spaces," says Lanny Joyce, director of energy management in the facilities services department. "Lighting is the most visible form of energy waste. Innovative lighting and controls are part of our overall energy and climate goals, and we appreciate the athletics department for bringing this forward." Perhaps most important, the lights improve the quality of play, according to women's head coach Mike Stevens. "These new lights are just much nicer to play under. They make a big difference in how you can see the ball."

SANTA CLARA UNIVERSITY, HOME OF THE BRONCOS

RECREATION CENTER PILOTS GREEN BUILDING UPGRADES

Starting in 2006, Santa Clara University used its 45,000-square-foot Malley Fitness and Recreation Center to test new sustainability-related equipment. According to the director of the Office of Sustainability, Lindsey Cromwell Kalkbrenner, “Malley Center was the first building on campus to use dual-flush toilets, the first to test compost collection of paper towels, and the first to install occupancy sensors for lighting in storage closets and workrooms.” The facility uses treated wastewater for landscaping. The collaboration between the recreation department and the sustainability office fostered stronger campus-wide understanding of the benefits of green building practices, including an improved indoor environment, user wellbeing, and cost savings.

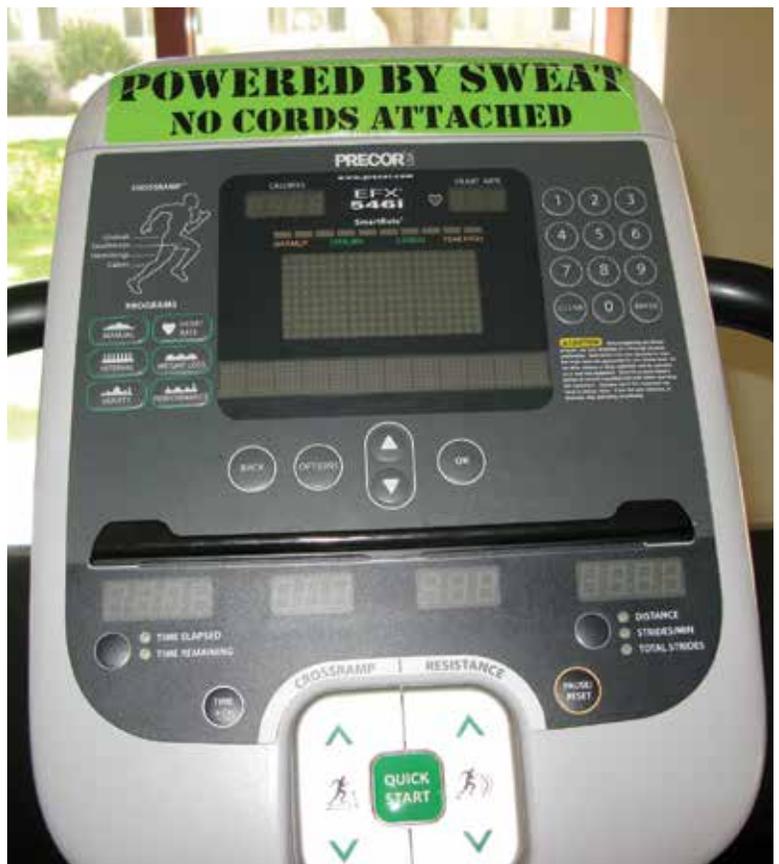
In 2008, the director of recreation, Janice DeMonsi, took advantage of growing campus support for environmental responsibility to justify a myriad of sustainability-related purchases, such as pool tarps that minimize heat-loss, saving energy and reducing heating costs. Campus recreation also implemented a new software program in 2008 that eliminated the need for three-page carbon-copy paper membership agreements and locker rental forms. This led to a department-wide paperless initiative. Now, all department news and other information is available only online, and a single laminated news sheet is posted in the gym instead of circulated on multiple flyers. Signature forms are now half or a third of a page, among other paper reduction initiatives.

In 2011, the athletics department partnered with campus recreation and the Office of Sustainability to create a paid undergraduate sustainability internship for athletics and recreation. In January 2012, intern Megan Anders (class of 2014 and NCAA Division I volleyball player) helped advance and publicize the variety of sports greening initiatives happening across the Santa Clara campus. Anders started by educating the 1,200 daily gym-goers about the 33 self-powered cardio machines in the Malley Center. She designed “Powered by Sweat” stickers for all of the machines and produced large educational posters about the environmental benefits of the self-powered machines. These posters reminded students that by using these cardio machines during workouts, they were saving the rec center 6,330 kilowatts of electricity each month (equivalent to the amount of energy generated by 489 gallons of gas, or enough electricity to run an average laptop for five years). The self-powered machines also avoid the release of 4.4 metric tons of greenhouse gas emissions every month.

Anders also created an energy efficiency display in the gym lobby, where users could test two of the self-powered treadmills. The display, which stood for two weeks, encouraged students to think about their environmental impact and undertake greener actions in sports facilities as well as campus-wide. Anders’ eye-catching posters change quarterly and are mounted in the student-athlete training room, Leavey Event Center restrooms, and throughout Malley center. “As an athlete, I already have connections with my coaches, other coaches, media, and athletic staff. This allows me to go directly to them with requests for our greening work,” says Anders.



Photos courtesy of Santa Clara University



COLUMBIA UNIVERSITY, HOME OF THE LIONS

SPORTS CENTER BUILT TO LEED SILVER STANDARDS

In March 2013, Columbia University opened its Campbell Sports Center, the first new building at the Baker Athletics Complex in more than 60 years. The 48,000-square-foot facility, designed by Stephen Holl Architects, is expected to achieve a minimum of LEED Silver certification. The five-story center includes a variety of more sustainable building practices that reflect the university's commitment to green architecture, reinforced by Columbia's campus-wide 2012 LEED Platinum certification for Neighborhood Development and its Gold rating from AASHE's STARS program. The sports complex's green features include low-flow fixtures, high-efficiency equipment and lighting, building materials made with recycled content, bike racks, demand-control ventilation, daylighting, and rain-screen cladding (an outer layer of insulation that helps moderate the temperature of the building throughout the year and reduce energy use).

Columbia Athletics also integrates greener practices into its operations. For example, the athletics department donates all prepared but untouched concession food in partnership with the nonprofit Rock and Wrap It Up. This helps feed local people in need, saves energy and water that would have been used to make additional meals, diverts waste from landfills and incinerators, and reduces greenhouse gas emissions (from decomposing food waste in landfills). In January 2012, student-athletes also formed a Columbia Athletics environmental organization called "EcoLions." The students launched a shoe reuse program with Shoebox Recycling and have donated more than 200 pairs of shoes for reuse to date. They have also worked closely with the athletics department to roll out an environmental education campaign, posting signs and green tips throughout team locker rooms and athletics buildings.

"EcoLions is a group we created as part of the Student-Athlete Advisory Committee," says varsity athlete and EcoLions founder Emma Tuzinkiewicz (class of 2015). "We work closely with the athletics administration and have support from the Columbia Office of Environmental Stewardship to help make Columbia's sports operations more environmentally friendly. We are very excited to expand our sports greening projects in partnership with the Ivy Green Initiative and with help from the Natural Resources Defense Council." Next, Columbia Athletics will work to expand its sports facility recycling programs.



Photo courtesy of Columbia University.

"ECOLIONS IS A GROUP WE CREATED AS PART OF THE STUDENT-ATHLETE ADVISORY COMMITTEE," SAYS ECOLIONS FOUNDER EMMA TUZINKIEWICZ. "WE ARE VERY EXCITED TO EXPAND OUR SPORTS GREENING WORK IN PARTNERSHIP WITH THE IVY GREEN INITIATIVE."

UNIVERSITY OF SOUTHERN CALIFORNIA, HOME OF THE TROJANS

USING HUMOR TO ENCOURAGE RECYCLING



Photos courtesy of University of Southern California.

During the 2012 football season, the University of Southern California (USC) launched a tailgate "zero waste" diversion and certification program. This program enjoyed a very successful inaugural year. Accomplishments included engaging nine student team leaders and 410 student "peer educators," educating 40,000 to 65,000 fans per game, and diverting more than 11,581 pounds of recyclable material (including more than 23,000 plastic cups) and 2,820 pounds of compostable material from landfill. During the 2012 football season, USC Athletics partnered with USC's Office of Sustainability to conduct a waste audit and pilot a venue recycling program. The Office of Sustainability is currently partnering with the operations team at USC's Los Angeles Memorial Coliseum to map out strategies to reduce waste during game days in 2013.

"While the program is enjoying some early success, there is still a long way to go in reaching a truly sustainable game day campus experience," says Halli Bovia, sustainability program manager at USC. "For the 2013 season, we expect student peer educator recruitment to be easier as we become more established. Additionally, we are focusing on reaching out to the larger, more organized tailgates to assist them in coming on board as 'zero waste' tailgates." One of USC's most successful recycling outreach efforts to date contributed to the game day atmosphere with humor. "Rather than becoming the 'trash police,' we emphasized a more jovial educator approach," explains Bovia. "Our student team worked on program marketing and came up with a variety of ways to encourage recycling while making people laugh." The team laminated and posted humorous signs based on popular Internet memes near waste diversion stations around athletic venues and in the tailgating areas at football games. "These signs were so popular that many of them went missing by breakdown time," says Bovia. "And while the popularity of the signs is waning, we will continue to look for fun and engaging ways to create a cultural shift regarding waste on campus."

UNIVERSITY OF MARYLAND, HOME OF THE TERRAPINS

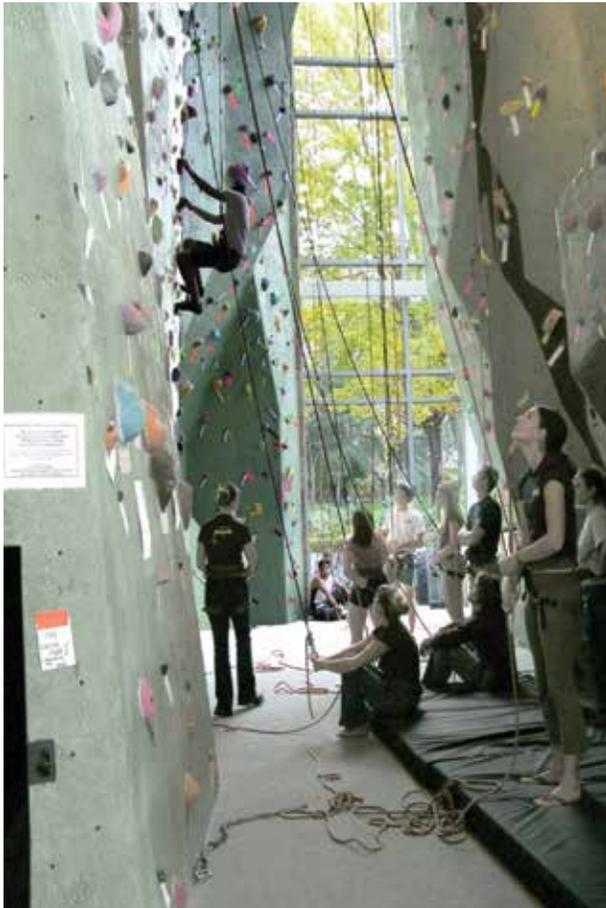
“FEED THE TURTLE” ATHLETICS RECYCLING AND COMPOSTING PROGRAM

The University of Maryland’s campus recycling rate increased from 17 percent in 2003 to 63 percent in 2010, thanks to support from its athletics program. To help boost the campus’s overall waste diversion rate, in the fall of 2006 Maryland Athletics implemented a football game recycling program in collaboration with the department of transportation services (which cleans parking lots after games) and the department of facilities management (which maintains campus grounds and facilities and transports recyclables and solid waste). The program yielded an average of two tons of recyclables at each game.

In the fall of 2008, the departments of athletics, facilities management, and dining services, with support from the administration, collaborated to develop a “Feed the Turtle” pilot program to expand recycling and institute food waste composting at all home football games. “Maryland Athletics is excited about launching Feed the Turtle as a pilot program for the rest of campus,” said Cheryl Levick, executive senior associate athletics director, at the program launch in 2008. “We are committed to the president’s sustainability initiatives and look forward to rolling out the program to 50,000 of the best football fans in the country.” The goals of the program, according to Maryland Athletics, were to divert solid waste from landfills, improve the game experience in and around Byrd Stadium, and provide environmental outreach to fans. As part of the program, Athletics distributed 140,000 recycling and trash bags to tailgaters. To promote the initiative, concessionaires gave away 5,000 reusable totes to students and other fans at the first home football game.

The program included new, custom-built containers made of recycled plastic to collect recyclables and food waste in the stadium, tailgater “valet recycling” (recycling bag pickup in select tailgating lots), and an event staff training plan. Dining services replaced polystyrene takeout containers with compostable containers made of bagasse, a plant-based product derived from the waste produced from processing sugarcane. Since the bagasse containers were more expensive, dining services launched a campaign to encourage diners to “eat in” using washable dinnerware, which resulted in a 15 percent reduction in the use of takeout containers. This helped offset the increased cost of the containers while increasing the percentage of waste that was compostable. Over the course of seven home games, the Feed the Turtle program resulted in the diversion of nearly 59 tons of solid waste from landfills and an average waste diversion rate of 41 percent for the 2008 football season. The program was expanded to include home basketball games in 2009 and to more sports in 2010, and it continues to be strongly supported by fans.

Photo courtesy of Sonoma State University.



SONOMA STATE UNIVERSITY, HOME OF THE SEAWOLVES

RECREATION CENTER GREEN BUILDING LEADERSHIP

Sonoma State University (SSU) set out in 2000 to build a recreation center that would become a model for sustainability. “Sustainable design and operations in collegiate recreation centers is not a fad. The case can be made for designing buildings that combine health, saving money, and a beneficial impact on the environment,” says Pam Su, SSU’s director of campus recreation. “Ultimately, it is the right thing to do, and the students and the campus benefit from going green. Being an early adopter and helping others in NIRSA learn from us through tours, presentations, and information have been goals from the start. We share our recreation center greening achievements in order to help others achieve success on their campuses.”

SSU recreation prioritized a concept called “biophilic design,” which involves using natural light, outside views, and outside air to improve the wellbeing of Rec Center users. Though the campus recreation department decided not to pursue LEED certification, it did use the U.S. Green Building Council’s LEED building standards to guide the design, construction, and operations of the center. “LEED credit systems remain a key resource that we return to over the years. Although we have not pursued LEED certification, we used LEED-NC to guide design and LEED-EBOM to guide operations of the SSU Rec Center,” says Su, referring to standards for new construction and the operation of existing buildings. “The information and guidance provided by these standards set our expectations, educate our staff, and inform practices throughout the facility.”

The Recreation Center’s green features include occupancy sensors, dimmable and programmable lighting, a customized building management system, efficient landscaping, low-flow faucets, 100 percent reclaimed water to flush toilets, reclaimed water for the fire sprinkler system, furniture constructed with recycled

“THE REC CENTER HAS HELPED SHAPE STUDENT EXPECTATIONS ABOUT NEW BUILDINGS AND OTHER PRACTICES ACROSS THE CAMPUS,” SAYS PAM SU, DIRECTOR OF CAMPUS RECREATION. “BECAUSE STUDENTS ARE EDUCATED ABOUT THE EFFORTS AT THE BUILDING, THEY ASK WHAT IS BEING DONE IN OTHER BUILDINGS ON CAMPUS.”

and reused materials, and environmentally-oriented educational signs throughout the building. SSU also surveyed the educational impact of the Recreation Center’s green features on the local community. “A recent occupant satisfaction survey revealed that 85 percent of those working in the Rec Center are positively influenced to go green in their personal lives because of working in the Rec Center. Many of our student employees share stories of adopting practices they learned on the job, bringing them home to ask their parents to make changes or bringing them to the workplace in their first job out of college,” says Su. “The Rec Center has helped shape student expectations about new buildings and other practices across the campus. Because students are educated about the efforts at the building, they ask what is being done in other buildings on campus.”

Photo courtesy of Sonoma State University.



PRINCETON UNIVERSITY, HOME OF THE TIGERS

WATER-EFFICIENT FIELD HOCKEY TURF

In 2012, Princeton Athletics renovated its field hockey turf to incorporate an upgraded drainage system that can hold water longer, reducing the need to re-water while also providing rapid surface drainage to prevent puddles. Jeff Graydon, Princeton’s associate athletic director for facilities, worked with AstroTurf engineers to select a system with a 3mm urethane backing and a uniform pattern of drainage holes. This allows the field to retain the right amount of moisture for the best ball movement during play while still enabling the field to drain. The turf drainage system allows the water to recharge groundwater and eliminates runoff into the stormwater system. It is designed to retain 100 percent of the water from a 100-year storm, exceeding Princeton’s sustainability goal for stormwater management. “We wanted to create a very efficient and consistent surface that gives the team with the highest skill level the best opportunity to win,” Graydon says.

“WE WANTED TO CREATE A VERY EFFICIENT AND CONSISTENT SURFACE THAT GIVES THE TEAM WITH THE HIGHEST SKILL LEVEL THE BEST OPPORTUNITY TO WIN,” SAYS JEFF GRAYDON, ASSOCIATE ATHLETIC DIRECTOR FOR FACILITIES.

In the past, Princeton’s water cannon system used as much as 12,000 gallons of water to wet the field for every practice and every game. The upgraded turf requires only 1,200 gallons and a single pass of the new, more efficient water cannons, saving at least 10,000 gallons of water each time the field is used. Even on a hot day the field needs two passes at most, using less than 2,000 gallons of water. Field hockey coach Kristen Holmes-Winn has a smartphone application that allows her to control the water cannons remotely. Princeton Athletics also developed a new method of turf placement for all irrigation heads that eliminates water loss.



UNIVERSITY OF SOUTH CAROLINA, HOME OF THE FIGHTING GAMECOCKS

TAILGATING RECYCLING IN PARTNERSHIP WITH ESPN

“The development of a waste diversion program at our athletics events has been a long-standing goal at the University of South Carolina,” says Larry Cook, university recycling coordinator. “To date, the main focus of these efforts has been football games at Williams-Brice Stadium and the surrounding tailgating areas.” The stadium can hold 80,250 fans and draws several times that number in the tailgating lots. “The costs of cleaning up after events are significant, and a successful recycling program can have many benefits,” Cook notes.

Though the University of South Carolina (SC) previously provided recycling at some football games, the permanent recycling program began during the 2009 football season, when the school hosted ESPN’s “College GameDay.” ESPN was interested in instituting environmental initiatives at the event and reached out to SC to encourage implementation of a recycling program in the stadium and at tailgating sites. During the fall of 2012, SC engaged 74 volunteers, handed out 4,400 recycling bags to tailgaters, collected 4,210 pounds of tailgater recyclables, and collected 40,700 pounds of recyclables in the stadium. The program cost SC a total of \$3,530 for bags, volunteer T-shirts, 44 hours of staff labor, and media outreach.

In working to establish an effective tailgate recycling program at University of South Carolina home football games, the organizers experienced challenges common to most recycling programs. These challenges included providing adequate access to recycling resources, educating participants about the availability of those resources and how to properly use them, reducing contamination of the collected material (especially food waste), collecting recyclables efficiently and effectively, and funding the staff and materials for the program. In the future, the athletics department, Sustainable Carolina, and the facilities department plan to expand the program’s focus to address issues of accessibility, awareness, collection efficiency, and funding to build on the tailgating program and to create consistent access to recycling resources.