

sustainability @ ASU

2012 sustainability accomplishments

highlights



teaching
discovering
solving



how do we create a sustainable way of life?

“ASU is a New American University promoting excellence in its research and among students, faculty and staff, increasing access to its educational resources and working with communities to positively impact social and economic development . . . through research and freely shared knowledge, we can create a socially, economically, and ecologically responsive society—a global community that understands the consequences of our actions and acts accordingly.”

—President Michael M. Crow

A university-wide commitment to sustainability encompasses all units at all four campuses. As the hub of Arizona State University's sustainability initiatives, the Global Institute of Sustainability is proud to report the sustainability-related accomplishments of the university for July 2011 through June 2012.

downtown campus

west campus

Global Institute of Sustainability

ASU's sustainability commitment reaches across all colleges and institutes

| |
|-------------------------------------------------------------|
| Biodesign Institute |
| W. P. Carey School of Business |
| Herberger Institute for Design and the Arts |
| Mary Lou Fulton Teachers College |
| Ira A. Fulton Schools of Engineering |
| Graduate College |
| Health Solutions |
| Barrett, the Honors College |
| Walter Cronkite School of Journalism and Mass Communication |
| Sandra Day O'Connor College of Law |
| School of Letters and Sciences |
| College of Liberal Arts and Sciences |
| New College of Interdisciplinary Arts and Sciences |
| College of Public Programs |
| School of Sustainability |
| College of Technology and Innovation |
| University College |

sustainability scientists and

Inaugurated in December 2011 with 215 faculty from across the university, ASU's sustainability scientists and scholars grew to 253 by the end of fiscal year 2012.

Ann Kinzig and Charles Perrings co-authored a group paper in the journal, ***Nature***, calling for action to preserve Earth's remaining biodiversity. The group's conclusions stem from an analysis of more than 1,000 ecological studies.

Several sustainability scientists and scholars joined 3,000 world experts to discuss climate change, geo-engineering, and international governance (in London) at the **2012 Planet Under Pressure** forum.

Harvey Bryan was lead university researcher on the **U.S. Department of Energy SunShot Initiative**.

Kenneth Abbott, along with 30 other scientists from around the world, authored a ***Science*** journal article advocating the need for a roadmap to successful sustainability governance within the next decade.

Vijay Vittal led ASU's **Power Systems Engineering Research Center's** work in developing a more sustainable electric grid system.

Ann Kinzig led a study published by the journal,

Science, that assessed the promise and pitfalls of mechanisms to pay for public ecosystem services like climate regulation and habitat provision.

Christiana Honsberg was chosen to direct an \$18.5 million **Engineering Research Center** for Quantum Energy and Sustainable Solar Technologies.

George Basile and James C. Hershauer co-authored, along with several other sustainability experts, ***The Business of Sustainability: Trends, Policies, Practices, and Stories of Success***; a book explaining how businesses can become more sustainable.

Enrique Vivoni and School of Sustainable Engineering and the Built Environment doctoral student Alexander Baish developed a **sustainable water management** system for Monterrey, Mexico.

At the 2012 meeting of the **American Association for the Advancement of Science**, Patricia Gober shared findings that show Phoenix water shortages are the result of high outdoor water use and fragmented governance, not climate change.

L to R: ASU sustainability scientists Ann Kinzig, Harvey Bryan, Christiana Honsberg, Netra Chhetri, Lee Hartwell.



scholars

Kerry Smith's research on bonds appeared in ***The Economists' Voice***. He suggested that bonds can help mitigate considerable risks of large, environmental construction processes, like drilling and fracking, and hold those responsible for the risks.

Aaron Golub's work on retrofitting an Avondale cul-de-sac was featured on a **National Public Radio** broadcast.

Cun-Zheng Ning and engineering student Derek Caselli designed a new solar photovoltaic cell system that produces **more electricity at a lower cost**.

Netra Chhetri and the Consortium for Science, Policy, and Outcomes helped launch the **U.S.**

Sustainability Scientists & Scholars



World Wide Views on Biodiversity project in Washington, D.C.

Neal Woodbury was chosen as co-director of a four-year, **\$30.7 million defense contract** for developing diagnostic technology that provides early detection of infectious disease.

Nobel Laureate Lee Hartwell led a research **collaboration between China and ASU** to advance early and predictive diagnostics for colorectal cancer.

The third floor of Wrigley Hall was renovated to offer meeting, video-conferencing and office space for sustainability scientists and scholars; holding 139 meetings throughout the fiscal year.



use-inspired research

Sustainability scientists and scholars are engaged in hundreds of research projects funded by external awards exceeding **\$70 million** annually.

Central Arizona-Phoenix Long-Term Ecological Research (CAP LTER) work on **urban heat island effects** was profiled in *Wired Magazine*.

ASU opened the world's largest national **algae test-bed facility** at its Arizona Center for Algae Technology and Innovation (AzCATI) on the Polytechnic campus.

Faculty and students engaged in sustainability research to find solutions for technical and environmental **homeland security** issues.

The Sustainability Consortium's membership grew to **96 multinational companies**, governmental and non-governmental organizations.

Central Arizona-Phoenix Long-Term Ecological Research (CAP LTER) was featured in the journal, *Bioscience*, highlighting **human impacts on 35 headwater basins**.

ASU's Center for Sustainable Health was awarded a \$3 million grant to expand its mission in **improving health outcomes** and reducing the financial and human cost of disease.

The **Swette Center for Environmental Biotechnology** was renamed after investors Brian and Kelly Swette.

National Science Foundation awarded ASU \$3 million to launch an **alternative energy doctoral program**.

McCain Institute for International Leadership was established to promote **character-driven leadership**, as well as research and decision-making in the areas of humanitarian work, human rights and national security.

The **Conservation Alliance** was formed, including ASU's CAP LTER and Ecosystem Conservation and Resilience Initiative (ECRI), to address major issues affecting metro Phoenix's mountain preserves.

Decision Theater's work in **legal preparedness** was highlighted in a *Disaster Medicine and Public Health Preparedness* journal article.



"The School of Sustainability always supported my academic and professional career. While I was conducting my doctoral studies, I earned my Certified Supply Chain Professional designation and took advantage of entrepreneurial opportunities. I was able to compete in global forums such as the MIT Clean Energy Prize, NASDAQ Marketplace, and the Walmart Better Living Business Plan Challenge."

—Marco Ugarte, Doctor of Philosophy, Class of 2011,
School of Sustainability



ASU's Southwest Center for Education and the Natural Environment (SCENE) **Research Experiences for High School Students** program on PBS's Arizona Horizon was discussed by engineering professor Nathan Newman and high school student Jean Juang.

University researchers from all departments gathered at the 2012 American Association for the Advancement of Science to speak about **solar power, village modernization, and water security.**

The Sustainability Consortium opened a **European office** and welcomed non-governmental organization members to its board of directors.

The Collaboratory at ASU's College of Technology and Innovation led **solar power training** in Aruba.

An ASU and the University of New Mexico team was chosen to compete in the U.S. Department of Energy's 2013 **Solar Decathlon.**



solar power training in Aruba



CAP LTER headwater basin research



algae test-bed facility



2013 Solar Decathlon team

university-wide awards for sustainability

ASU was given a Gold rating for **The Association for the Advancement of Sustainability in Higher Education's** Sustainability Tracking, Assessment, and Rating System (AASHE STARS).

ASU made the **Princeton Review's** 2012 Green Rating Honor Roll.

ASU made the **Princeton Review's** 2012 Guide to 322 Green Colleges.

ASU ranked 23 out of 118 schools for **Sierra Magazine's** Cool Schools.

ASU received the Solar Partner of the Year Award from the **Solar Electric Power Association**.

Sustainable Cities Network's Regional Tree and Shade Summit received **Valley Forward's Environmental Excellence Merit Award**.

Sustainable Cities Network was honored by ASU President Michael Crow with a 2012 **President's Award for Sustainability**.

Farmers Market @ the ASU Tempe campus was given a 2012 **President's Award for Sustainability**.



2012 Climate Leadership Award

Arizona State University was one of two doctoral-granting academic institutions to receive a Climate Leadership Award from the **American College and University Presidents' Climate Commitment** and its supporting organization, Second Nature. ASU was recognized for unparalleled campus innovation and climate leadership that helps transition society to a clean, just, and sustainable future.



Tempe campus farmers market

applying concepts

ASU released a **Strategic Plan for Sustainability Practices and Operations** to communicate its practices and goals in achieving campus-wide sustainability.

The **Sustainability Initiatives Revolving Fund** helped improve West campus's efficiency and installed meters on almost all university buildings.

Campus sustainability certifications now include green offices and green laboratories.

Waste Management of Arizona and ASU launched **Roadmap to Zero Solid Waste** to eliminate 90 percent of the university's solid waste by 2015.

During 12 **campus Farmers Markets**, more than 5,000 students, faculty, and staff purchased produce and locally prepared foods.



building to lead

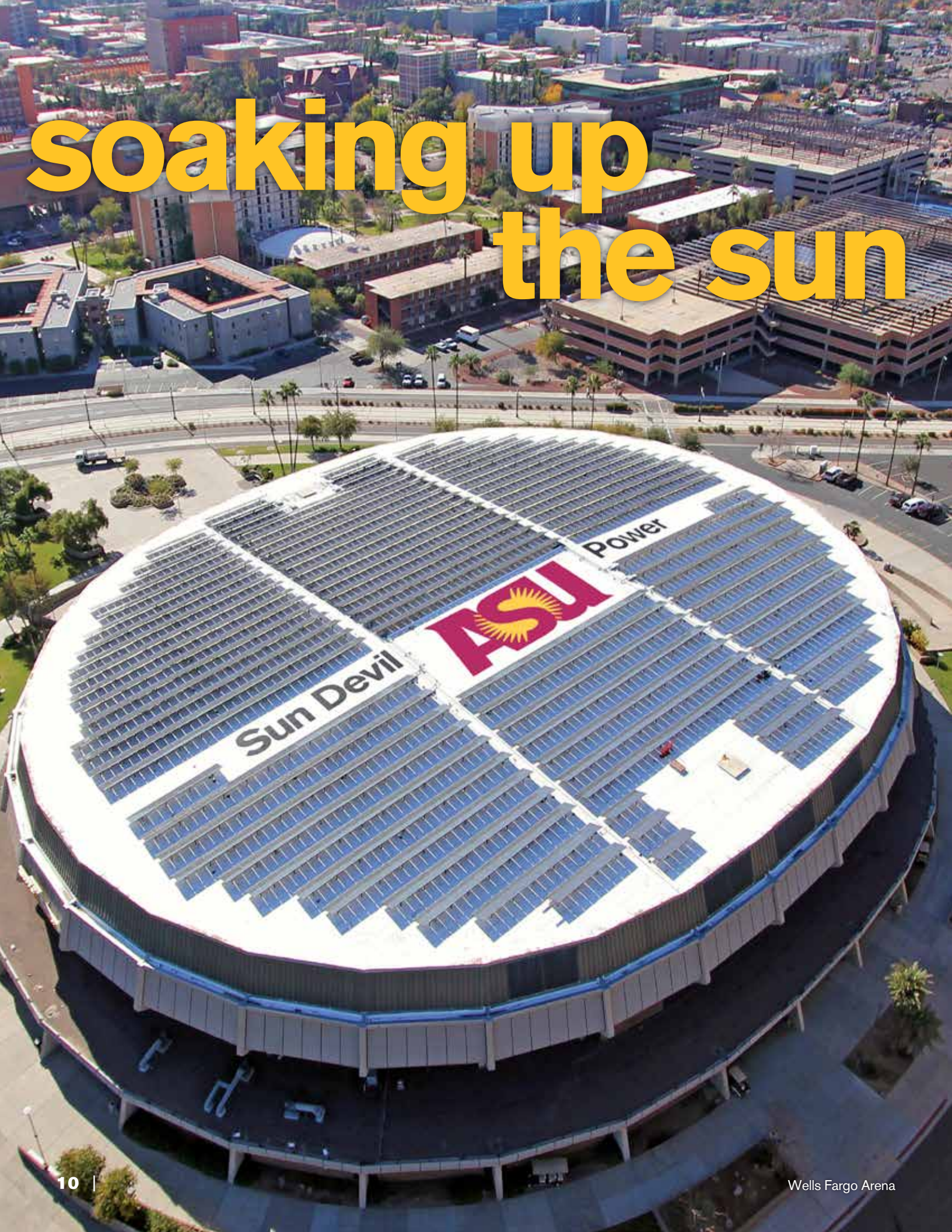
The **Weatherup Center**, ASU's basketball training facility, was awarded U.S. Green Building Council LEED Gold certification.

Out of ASU's total building square footage, 13% is LEED-certified. To date, ASU has **18 completed LEED-certified projects** comprised of 36 buildings and the Memorial Union's second floor.

"Living in the School of Sustainability Residential Community helped me smoothly transition into college and living on my own. I met a wide variety of new friends in a friendly environment who were also studying sustainability. Having the opportunity to eat pizza with the dean in our lounge was pretty sweet, too."

—Clayton Beyer, sophomore, Economics of Sustainability track, School of Sustainability





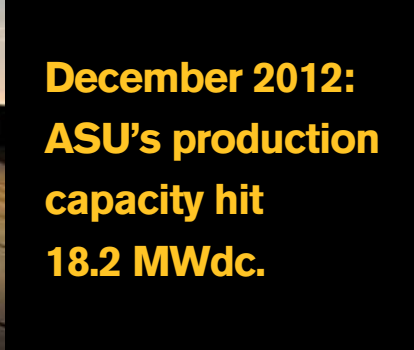
soaking up
the sun



Verde Dickey Dome



Downtown campus



Polytechnic campus



PowerParasol

December 2012: ASU's production capacity hit 18.2 MWdc.

By June 2012, ASU had installed 58 solar photovoltaic projects – **more than 62,000 panels** – across all four of its campuses. With a generating capacity of **15.3 megawatts**, this is the largest single-university installation in the country.

ASU installed the **PowerParasol**, a 5.25-acre solar panel structure that **shades more than 800 parking spaces** in Lot 59 at the Tempe campus. The installation brought the number of shaded parking spaces at ASU to more than 4,600.

ASU's **Polytechnic campus** got its first solar installation, an 800 kWdc solar power plant constructed in partnership with SRP.

A new solar installation at **Wells Fargo Arena** is visible from the airplane windows of flights into Sky Harbor Airport, reminding visitors of ASU's commitment to renewable energy.

The Walter Cronkite School of Journalism and Mass Communication installed a 77 kWdc solar array, the first solar installation on the **downtown Phoenix campus**.

For a comprehensive overview of Sustainability Operations at ASU, visit <http://sustainability.asu.edu/practice>. Look for the **Sustainability Operations Annual Review 2012** for more of ASU's sustainability accomplishments.



"As a student in the School of Sustainability, I interned for Carbon Roots International. I worked on a solar-electrification project in La Coupe, Haiti, conducting research on the demographics, daily flow, and infrastructure of the community."

—Danielle Westrom, junior, International Development and Sustainability track, School of Sustainability

walking the talk: Rob and Melani Walton Sustainability Solutions Initiatives



A **\$27.5 million investment by The Rob and Melani Walton Fund of the Walton Family Foundation** established the Rob and Melani Walton Sustainability Solutions Initiatives at the Global Institute of Sustainability.

Through eight distinct programs, the Walton Sustainability Solutions Initiatives bring together faculty, students, researchers, and global partners to **identify and solve local and global sustainability challenges**. The Initiatives deliver sustainability solutions, accelerate global impact, and inspire future leaders by combining real-world knowledge with innovative research.

Synergy among the eight programs gives the Rob and Melani Walton Sustainability Solutions Initiatives tremendous power to implement **real and meaningful change**.

Delivering Sustainability Solutions

Sustainability Solutions Extension Service

A consultancy that brings together custom teams to analyze and solve sustainability challenges.

Executive Master's for Sustainability Leadership

A degree that equips professionals to become sustainability change leaders within their organizations.

Center for Integrated Solutions to Climate Challenges

A source of research-based support tools for urban decision-makers facing climate uncertainty.

Accelerating Global Impact

Global Sustainability Studies Program

An opportunity to study and help solve sustainability problems in a global context.

Global Sustainability Solutions Centers

A collaboration with global partners to define sustainability challenges, create and implement solutions.

Inspiring Future Leaders

Walton Sustainability Fellowship Program

A network of thought leaders solving sustainability problems through research and teaching.

Sustainability Solutions Festival

A showcase for creative thinkers and entrepreneurs who develop solutions to sustainability challenges.

Next-Generation Sustainability Projects

A system to seed, nurture, and grow the most high-impact, cutting edge ideas in sustainability.

sustainabilitysolutions.asu.edu

ASU GLOBAL INSTITUTE
of SUSTAINABILITY

**Walton Sustainability
Solutions Initiatives**



School of Sustainability marked its fifth year

2011 undergraduate enrollment (total 467)



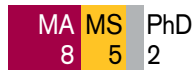
2011 graduate enrollment (total 77)



2012 undergraduate graduates (total 171)

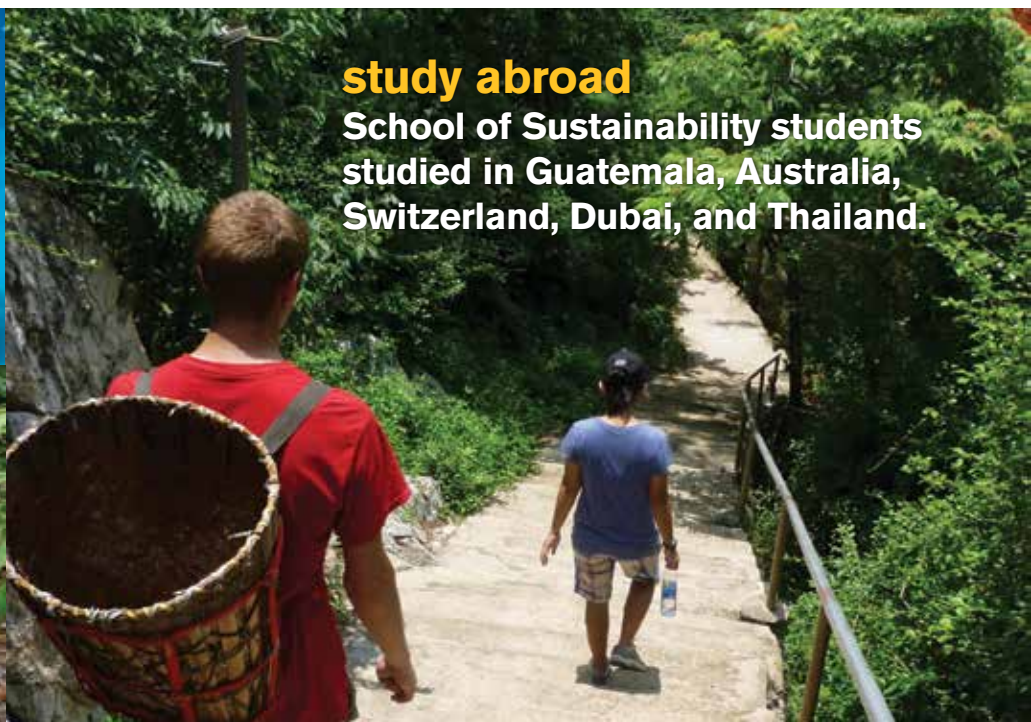


2012 graduate graduates (total 15)



alumni

The School of Sustainability established an alumni chapter with a mission to advance sustainability within and beyond Arizona State University. This 55-member chapter does this by facilitating a cohesive network of sustainability professionals; providing insight, service, and support to ASU alma mater; and through joint endeavors, to be a voice and a force for sustainability locally, nationally, and globally.



study abroad

School of Sustainability students studied in Guatemala, Australia, Switzerland, Dubai, and Thailand.



Graduate Certificate in Sustainability Leadership

First Innovations

sustainability education across ASU

150 graduate-level sustainability courses and **350 undergraduate-level** sustainability courses university-wide.

Partnering with the **U.S. Army and the Army National Guard**, the School of Sustainability created the Graduate Certificate in Sustainability Leadership to support continuing education for active duty and citizen soldiers.

ASU and the **U.S. Environmental Protection Agency** signed a Memorandum of Understanding to offer internships, projects, and research opportunities to students and faculty.

The **American Indian Policy Institute** in the College of Liberal Arts and Sciences created First

Innovations, an award-winning program where students build entrepreneurial and innovation skills for American Indian sustainability.

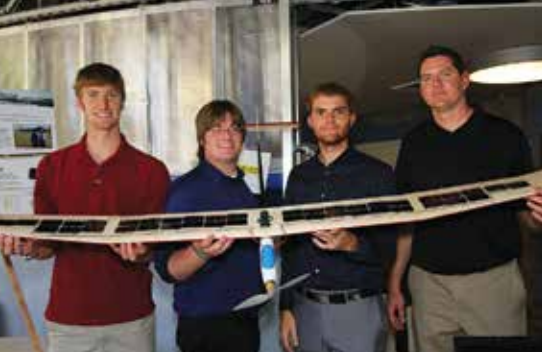
The **School for Engineering of Matter, Transport, and Energy** introduced its Professional Science Master's in Solar Energy Engineering and Commercialization.

Arnim Wiek and Aaron Golub led an ASU team that worked on a **transit-oriented development** project called: *Reinvent Phoenix: Cultivating Equity, Engagement, Economic Development and Design Excellence with TOD*.

"At the School of Sustainability, the staff genuinely wants students to succeed; they present these opportunities, like internships, that really help the students network. Real-world experience not only helps to apply the theory learned in the classroom, but also helps create relationships with people in the field."

—McKenzie Ragan, junior, International Development and Sustainability track, School of Sustainability





students as ch

Water safety in Africa

Daniel Nzengya, a Biodesign Institute researcher and doctoral student in the School of Sustainability, researched health issues and promoted sustainability education in Kenya.

Reducing negative agriculture impacts

A Human and Social Dimensions of Science and Technology student contributed to an international plan for doubling the world's food production while reducing harmful environmental impacts.

Organic waste to energy

Students in the College of Technology and Innovation designed an anaerobic digester system that converts dog waste into renewable energy to fuel a lamp at one of Gilbert's dog parks.

Rainforest ecosystems

Student teachers participating in the Desert to Rainforest program traveled to Panama to study alongside kindergarten through eighth grade teachers from Panama and Phoenix.

Solar-powered aircraft prototype

For a senior project, seven engineering undergraduates produced a solar-powered aircraft prototype and presented it to scientists and engineers from the U.S., Canada, and Germany.

Sustainability applied to youth

University doctoral students worked with middle school students and teachers from six schools to show them practical applications of sustainability science.

Containers as clinics

G3Box, company started by four ASU students, turns unused shipping containers into portable maternity and health clinics that can be shipped to countries with high mortality rates.

Sustainable solutions for waste energy

Two student-led companies, reNature Inc. and SmrtEn, developed ways to keep compostable waste out of the landfills and allow homeowners to remotely program their thermostats to save energy.





change agents

Local hunger solutions

Alumni and undergraduate student team FlashFlood created a mobile phone app for food providers to coordinate the collection and transportation of leftovers for community centers and people in need.

Water contamination

Team 33 Buckets, composed of biomedical engineering students, designed and built a water filtration system to be used at a Bangladesh school, providing 4,000 gallons of clean water a day.

Bamboo bicycles

The student group BooGood Bicycles engineered sustainable hand-cycles and bicycles to help disabled individuals in Africa get around easier in rugged terrain.

Reusing plastic bottles

Eric Beeler and Natasha Yenina each won a Pitchfork Award for Outstanding Sustainability Project for laying the groundwork to bring water bottle refill stations to campus.

Kids and conservation

School of Community Resources and Development graduate Jacqueline Ginter led environmental education programs as a ranger assistant at Oracle State Park in southeastern Arizona.

Battery drop-off boxes

Jared Doles, a film and media production major, used ASU's 10,000 Solutions website to propose on-campus boxes for safe battery disposal.

"The knowledge and thought processes that I have acquired at the School of Sustainability force me to see the bigger picture and look beyond conventional boundaries. I feel the skills I have acquired will put me in a position to make an impact in any project or job that I choose to pursue in the future."

—Amy Minowitz, master's student
School of Sustainability



sustainability student

Julie Ann Wrigley endowed the **Ray Anderson Memorial Scholarship** to honor the late entrepreneur and Global Institute of Sustainability Board Member for his contributions to the field of sustainability.

SustainabilityConnect was launched to bring together ASU individuals and professionals to work collaboratively on sustainability issues.

<https://sustainabilityconnect.asu.edu>

The Southwest Center for Education and the Natural Environment mentored eleven high school students who won awards at the Arizona Science and Engineering Fair.

Sustainability Science for Sustainable Schools piloted its first sustainability course at Tempe High School.

The Global Institute of Sustainability launched its **Thought Leader Series**, featuring commentaries on sustainability issues from prominent figures in sustainability both within and beyond ASU.

student awards



2012 Microsoft Imagine Cup



College Entrepreneurs of the Year



New Venture Championship Award



Reach for the Stars Fellowships



Moeur Awards



Sustainability Scholarship Awards



Student Sustainability Innovation and Entrepreneurship Award



Pitchfork Awards

Priscilla Richards Outstanding International Student Leadership Award

"The School of Sustainability allowed me to broaden my understanding of sustainability. Thanks to the School of Sustainability, I was able to apply what I learned in the classroom to the real world by doing an internship with Dell as a Sustainability Assistant."

—Hyejung Lim, senior, Society and Sustainability track,
School of Sustainability



honors

School of Sustainability students established **the nation's first sustainability honor society**. As a network of sustainability scholars, the honor society envisions a future where sustainable practices are a reality in a global society. Basing their vision on three pillars of sustainability—**economic, environmental, and societal**—members further sustainable economic development, advance social justice, and foster environmental stewardship.

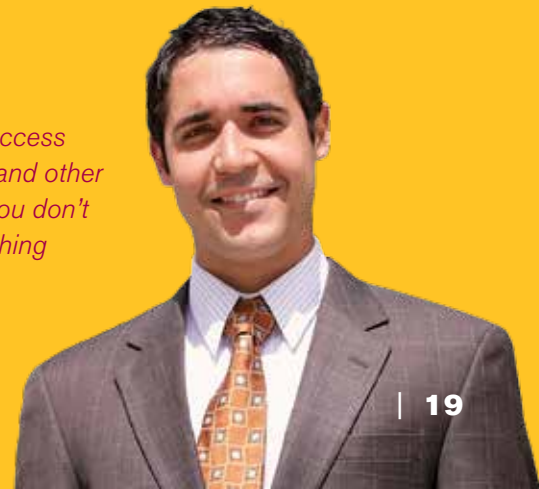


Honor Society for Sustainability, 2012



"Five years ago, I was worried about just graduating high school. I attribute my success to the relationships I've had with faculty and staff at the School of Sustainability and other team members in the honor society. It shows that if you believe in yourself and you don't take 'no' for an answer, you stop making excuses and you can do anything. Anything is possible."

—Max Scott, Bachelor of Arts, Class of 2012,
School of Sustainability



sharing knowledge





Mayoral discussion on sustainability



Law professor Robin Morris Collin discusses environmental justice

through collaboration and education

The Global Institute of Sustainability sponsored **more than 30 lectures, presentations, and panel discussions**, including a Phoenix mayoral debate on sustainability. Featured speakers included Phoenix Mayor Greg Stanton, Tempe Mayor Mark Mitchell, and Mesa Mayor Scott Smith. Author Gary Nabhan, **Wrigley Lecturers** William McDonough, Frank Sesno, Robin Morris Collin, Gernot Wagner and visiting scientists Carlo Jaeger and Wally Broecker were also featured.

With **NBC Learns**, the **National Science Foundation**, and **Discover magazine**, ASU hosted a Changing Planet town hall panel discussion on climate change and sustainable water supplies.

In partnership with the **EPA** and **American Public Media's Public Insight Network**, the Global Institute of Sustainability presented an American Innovation for Sustainability forum in Washington, D.C., to highlight environmental innovations.

Representatives from each of Arizona's state universities gathered at the event, **Climate Change in Arizona: Current Knowledge and Future Collaborations among the State Universities**, hosted by the Global Institute of Sustainability.

ASU hosted the third **International Conference on Sustainability Science**, aimed at using science to solve sustainability issues.

The Global Institute of Sustainability, in partnership with the **Council of Educational Facility Planners International**, formed a one-day symposium, What's Next for Sustainable Schools and Communities?

ASU was the meeting grounds for 16 colleges participating in the Southwest Regional Collaborative Symposium of the **American College and University Presidents' Climate Commitment**.

The School of Sustainability was a sponsor of the multi-disciplinary, boundary-breaking event: **Emerge**, uniting artists, engineers, scientists, storytellers, and designers to rethink the future of humans and the environment.



ASU hosts The Weather Channel's *Changing Planet* Town Hall



Regional Climate Commitment Symposium at ASU

School of Sustainability faculty highlights

Seventy articles published in the following scholarly journals:

Advances in Water Resources

Biogeosciences

Chinese Journal of Applied Ecology

Climate Research

Current Opinion in Environmental Sustainability

Ecohydrology

Ecological Applications

Ecological Economics

Ecological Indicators

Ecology

Ecology and Society

Economics of Innovation and New Technology

Environmental Communication

Experimental Economics

Forest Ecology and Management

Frontiers in Ecology and the Environment

Geographical Journal

Global Environmental Change

Human Ecology

International Journal of Sustainable Transportation

Journal of Arid Environments

Journal of Biogeography

Journal of Environmental Economics and Management

Landscape and Urban Planning

Landscape Ecology

PLoS ONE

Population and Environment

Review of Economics and Statistics

Science

Science and Engineering Ethics

Sustainability

Sustainability Science

Water Resources Management

new School of Sustainability faculty



David Manuel-Navarrete

Dr. Manuel-Navarrete's research investigates climate change governance, socio-ecological inequality, and knowledge systems within agriculture. He explores how the boundaries produced by tourism regulate the access of diverse social groups to ecosystem services in coastal regions.



Sonja Klinsky

Dr. Klinsky's work analyzes how climate change policy is developed and perceived in both domestic and international arenas. Dr. Klinsky is engaged in research that explores public opinion about complex sustainability policy issues.



Michael Schoon

Dr. Schoon conducts research on cross-border collaborations among landowners, governmental agencies, and nation-states. He analyzes those collaborations that cover environmental issues like biodiversity conservation, water sharing, and fire management.

2012 United Nations Champion of the Earth

School of Sustainability Dean **Sander van der Leeuw** was chosen as the 2012 United Nations Champion of the Earth for Science and Innovation.



The Global Institute of Sustainability hosted visiting scientist **Wally Broecker**, Newberry Professor of Earth and Environmental Sciences from Columbia University.

The Global Institute of Sustainability hosted visiting scientist **Carlo Jaeger**, a professor from Potsdam University, Germany, and chair of the European Climate Forum.

Associated Students of ASU named **Aaron Golub** a 2011-2012 Centennial Professor.

Kris Mayes, director of the Law and Sustainability program, received the Green Pioneer award from the Phoenix Business Journal.

Colin Tetreault MA '10, sustainability adviser to the mayor of Phoenix, was named one of Phoenix Business Journal's 40 under 40.

Four Sustainability Scientists traveled abroad as Fulbright Scholars: **James Elser**, Argentina; **LaDawn Haglund**, Brazil; **Paul Hirt**, Slovenia; **Keith Kintigh**, Ireland.

Elinor Ostrom (1933-2012), research professor and ASU sustainability scientist, was named one of **Time Magazine's 100 Most Influential People of 2012.**



"As an older and more seasoned student just retiring from a military career, I felt some trepidation returning to college. At the School of Sustainability, I found the students and faculty to be of such diversity of age, gender, education, ethnicity, and nationality that classroom discussions were engaging and enlightening!"

—Felicia French, doctoral student
School of Sustainability



Maharashtra, India



Kumasi, Ghana



Haarlemmermeer, Netherlands



trans Himalaya region, Nepal

ASU sustainability research continues to extend globally

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