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2014 highlights

World Champion

Sustainability alumna Christa Brelsford wins her division at the IFSC Paraclimbing World Championship in Gijon, Spain

sustainability.asu.edu/degrees

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School of Sustainability
Arizona State University
PO Box 875502
Tempe, AZ 85287-5502

All correspondence, changes of address and other submissions can be addressed to **sosalumni@asu.edu**.

Produced by the Julie Ann Wrigley Global Institute of Sustainability at Arizona State University.

Sustainability in Action

Greetings

Alumni and Students

Faculty and Staff

ASU honors conservationist Julie Ann Wrigley, renames institute in her honor

2014 was a memorable year for ASU's Julie Ann Wrigley Global Institute of Sustainability. Alumni employment was high, enrollment in sustainability-related programs grew and the School of Sustainability expanded its program offerings. Meanwhile, new ASU centers and initiatives were launched, solutions-focused partnerships developed, research productivity increased and thousands attended institute events.

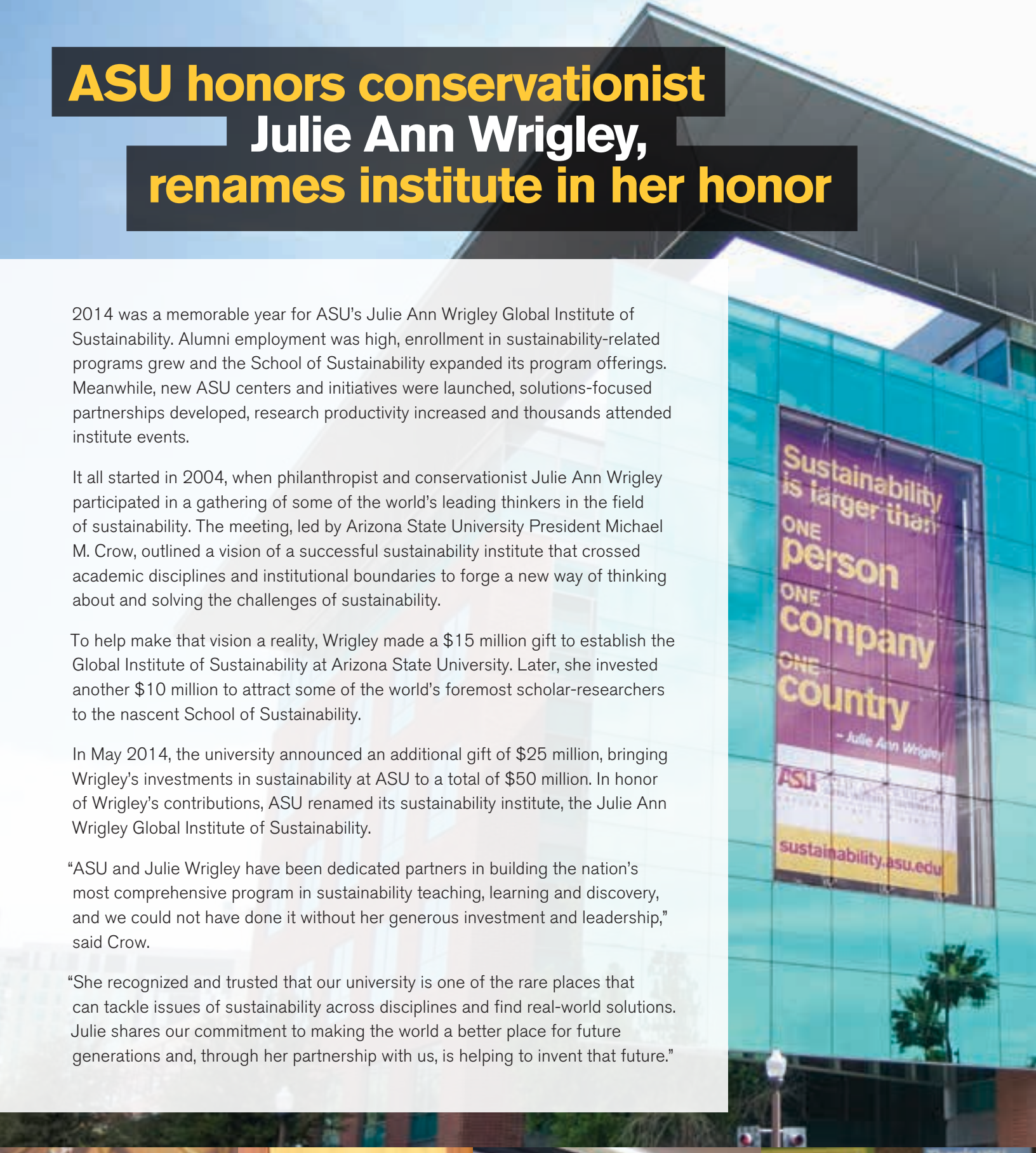
It all started in 2004, when philanthropist and conservationist Julie Ann Wrigley participated in a gathering of some of the world's leading thinkers in the field of sustainability. The meeting, led by Arizona State University President Michael M. Crow, outlined a vision of a successful sustainability institute that crossed academic disciplines and institutional boundaries to forge a new way of thinking about and solving the challenges of sustainability.

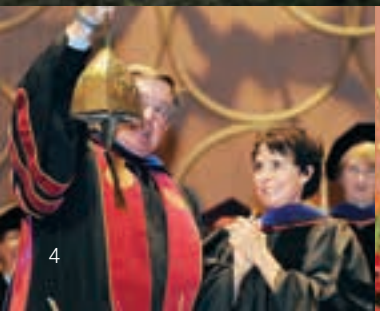
To help make that vision a reality, Wrigley made a $15 million gift to establish the Global Institute of Sustainability at Arizona State University. Later, she invested another $10 million to attract some of the world's foremost scholar-researchers to the nascent School of Sustainability.

In May 2014, the university announced an additional gift of $25 million, bringing Wrigley's investments in sustainability at ASU to a total of $50 million. In honor of Wrigley's contributions, ASU renamed its sustainability institute, the Julie Ann Wrigley Global Institute of Sustainability.

"ASU and Julie Wrigley have been dedicated partners in building the nation's most comprehensive program in sustainability teaching, learning and discovery, and we could not have done it without her generous investment and leadership," said Crow.

"She recognized and trusted that our university is one of the rare places that can tackle issues of sustainability across disciplines and find real-world solutions. Julie shares our commitment to making the world a better place for future generations and, through her partnership with us, is helping to invent that future."





A space to live & learn










A celebration in May 2014 marked the culmination of a months-long effort to recreate the courtyard of the School of Sustainability Residential Community, funded by a $5,000 grant from ASU's Sustainability Initiatives Revolving Fund.

The renovation transformed the SOSRC from a patio that was nothing more than rocks and weeds to a colorful and welcoming outdoor space designed to teach and immerse residents in the practices of living sustainably in an urban environment.

The SOSRC is located in the appropriately named "S Cluster" of Adelphi Commons II. Future plans include climbing vines for further heat mitigation and moisture retention, hanging planters and solar lights on the second story's balconies, and an increased capacity to house the School of Sustainability's growing number of students.

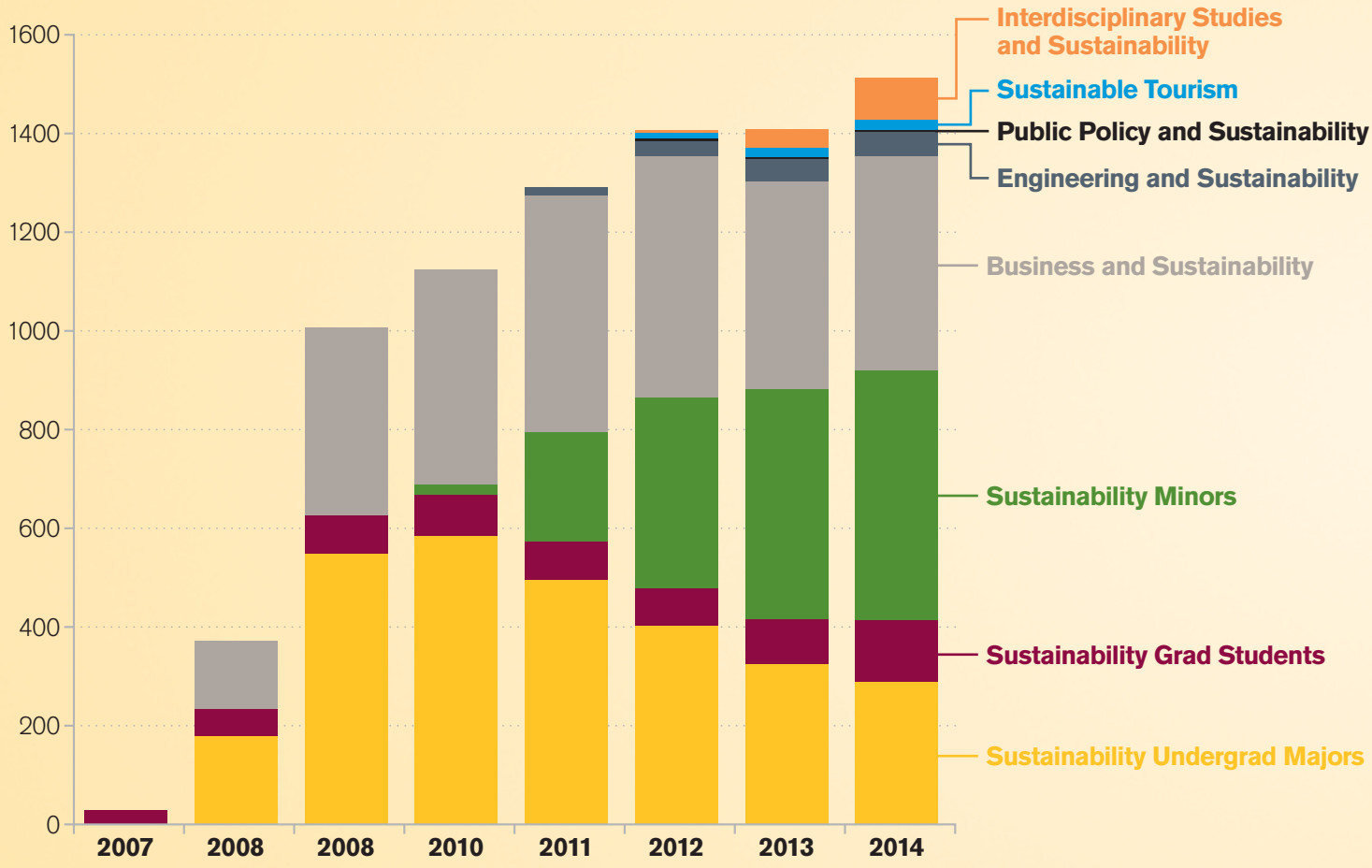
Among the sustainable features of the new space:

A new pulley **clothesline** system was installed, allowing students to dry their clothes outside and offsetting energy use.	New **rainwater barrels** were installed to capture water, which is used for the garden in conjunction with an irrigation system and hoses.
A student **gardening club** was created to plant, maintain and harvest garden produce from the new vertical garden.	**Solar outdoor lighting** captures solar energy during the day and allows students to relax in the outdoor space at night, creating a more livable space and community.

Sustainability Enrollment

The School of Sustainability continues to hold one of the highest student retention rates at ASU.

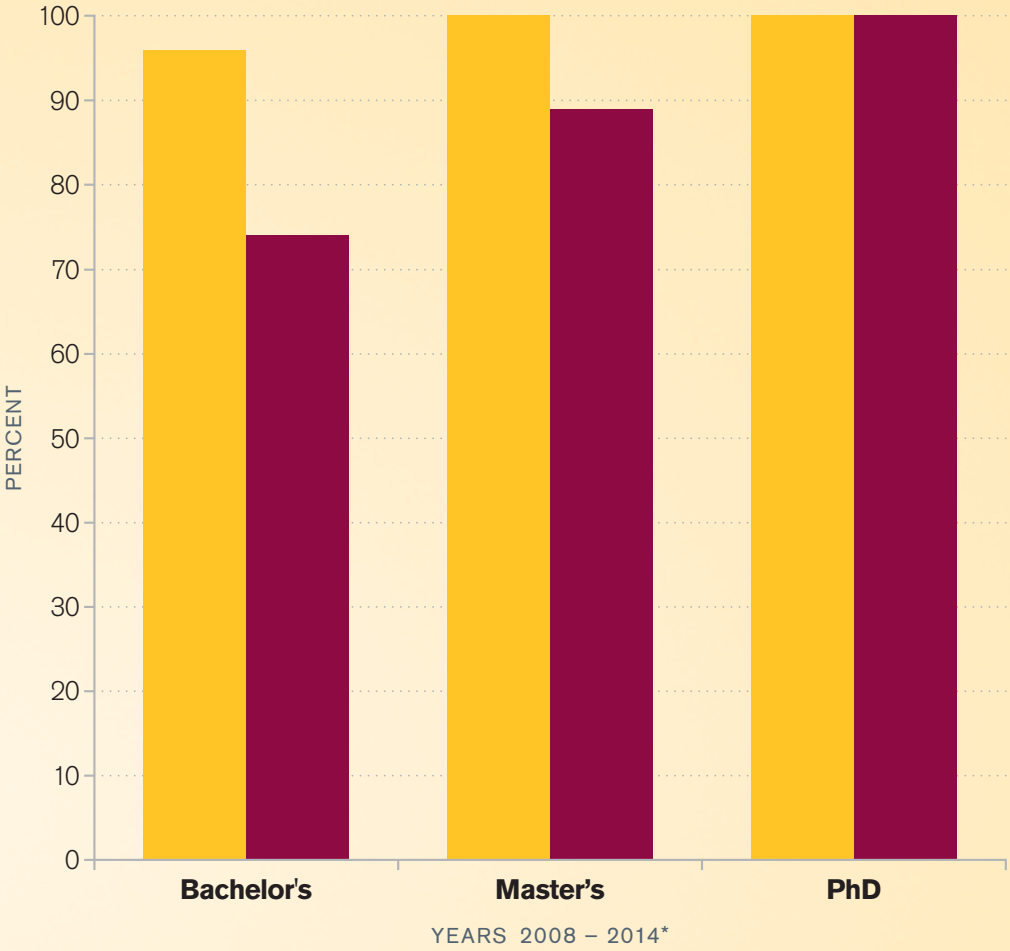
Over 96 percent of undergraduate sustainability majors who began here as first-time, full-time freshmen in Fall 2013 enrolled again in Fall 2014.



Sustainability Alumni

2014 graduates increased School of Sustainability alumni to a total of 717.

Alumni Employment



According to a 2014 School of Sustainability report, 73 percent of employed undergraduate alumni have found careers directly related to sustainability with companies like Aramark, Henkel, Intel, Waste Management, Tesla Motors and U-Haul International.

The report also shows that as educational experience increases, so does employment. Of the students surveyed, 88 percent of master's graduates and 100 percent of doctoral graduates are in sustainability careers. The private sector isn't the only one hiring – graduates have found positions with Central Arizona Project, Environmental Protection Agency and U.S. Geological Survey, as well as professorships at colleges including ASU, Illinois State University and Portland State University.

Since the first person graduated from Arizona State University's School of Sustainability in fall 2008, alumni have gone on to pioneer new sustainability positions and lead change at local, national and global organizations.

**Percentages based on student survey responses received*

Curtis Shaw
Recruitment Development and Corporate Relations
School of Sustainability
sos.asu.edu/career

Accomplishment

I can think of no better word to describe the School of Sustainability's activities over the last year. Our alumni, students, faculty and staff continue to amaze me.

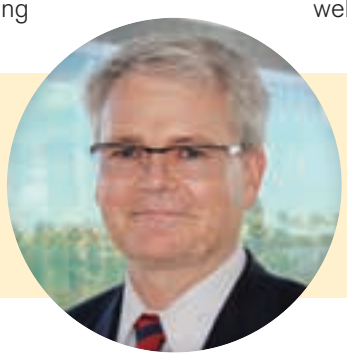
Our **graduates** are succeeding beyond expectations, finding meaningful employment at unprecedented rates and with the vast majority finding jobs directly related to sustainability. Nationally and for all undergraduate degrees, the degree-to-career match is about 25 percent. By contrast, the rate for SOS undergraduate alumni exceeds 75 percent, with even higher figures for master's and doctoral alumni. Our entrepreneurial students are convincing organizations of the critical added value of sustainability approaches to solving problems and building creative solutions.

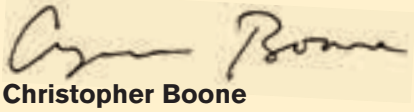
Our **students** are innovative. SOS students created the first Honor Society for Sustainability and they are assisting other universities to create their own chapters. The very first sustainability (co-ed) fraternity, Delta Alpha Upsilon, dedicated to upholding sustainability principles and the New American University Charter, is another student innovation incubated within the school.

Our **faculty and staff** are leading the way. They worked incredibly hard to expand the school's degree offerings and formulated a new set of program-level learning outcomes that will guide curriculum development and hiring in the coming years. Many are working on a project-based learning plan as an alternative to fulfilling the standard general studies requirements and as an instructional model for degree programs.

Research productivity for SOS faculty continues to be very strong, supported by over $18 million in external grants in 2014. This spring, Chuck Redman and Nancy Grimm were informed that their proposal for a $12 million Sustainability Research Network was recommended for funding by the National Science Foundation, one of only three that were awarded across the country. I am very proud of the incredibly talented faculty in SOS who continue to break ground with innovative, highly interdisciplinary, and outcome-oriented teaching and research.

The School of Sustainability is part of a university-wide dedication to **sustainability**, facilitated by its strong connections with the ASU Wrigley Institute, the Rob and Melani Walton Sustainability Solutions Initiatives, and dozens of other centers and colleges. Together, ASU faculty, staff, students and alumni have accomplished a great deal in sustainability, with the welcome promise of much more to come.





Christopher Boone
Dean, School of Sustainability
sos.asu.edu/dean

Making a world of difference

I have the great pleasure of working within the Julie Ann Wrigley Global Institute of Sustainability as we imagine the future impact the institute and school can have in our world. Sustainability is a defining value at ASU, a remarkable place where brilliant minds and devoted hearts come together to solve the problems of our society.

Having worked as a chief marketer in corporations, universities and an environmental NGO, I recognize that sustainability solutions are created at the nexus of ideas – the triple bottom line of people, planet and profit – as well as the drivers in our societies such as food, water, energy and well-being. At ASU, a powerful "synapse" occurs at these intersections, and new sustainability solutions are born.

It's my job and my joy to serve as the chief development officer at the ASU Wrigley Institute – to share our aspirations and inspire investment in the students, scholars and scientists who are, in fact, making a world of difference.

Connie Eggert
Senior Director of Development
ASU Foundation for a New American University
sos.asu.edu/invest

Featured Fellowships

USAID Research and Innovation Fellowship

Through a 2014 partnership with the U.S. Agency for International Development's Global Development Lab, the ASU Wrigley Institute administers this fellowship. Graduate students work with USAID and host organizations around the world to confront the most pressing issues faced by the developing world.

Stardust Center Student Fellowship

The Stardust Center for Affordable Homes and the Family introduced a student fellowship program in 2014 to advance inexpensive, safe and sustainable housing. Undergraduate student fellows provide welcomed assistance to partner organizations and gain valuable networking opportunities, insights and inspiration.

A field that bridges continents

The students enrolled in ASU's MasterCard Foundation Scholars Program share two key characteristics with the university: a commitment to fostering meaningful change and an enthusiasm for sustainability.

In August 2014, ASU welcomed its third cohort of scholars, representatives of 15 Sub-Saharan African nations who exemplify academic excellence and the potential for effective leadership. All 40 students came to the land of maroon and gold determined to improve their home communities when they return after four years of undergraduate schooling.

What is ASU's role in accomplishing this goal? ASU provides a high-caliber education along with the tools and capacities that innovative solutions require. As a complement to their chosen degree programs, all scholars take SOS 194: "Sustainability Issues in Africa," a course offered by the School of Sustainability.

MASTERCARD FOUNDATION SCHOLARS COMPETED IN ASU'S 2014 EARTH DAY SOCCER CLASSIC

Aryn Baxter, director of ASU's MasterCard Foundation Scholars Program and SOS 194 instructor, sees the course as a laboratory for formulating sustainable solutions to concerns in her students' home countries. Students participate in a semester-long project aimed at addressing challenges in areas that they identify, like education, entrepreneurship, food production and storage, renewable energy and clean water access.

"I see sustainability as highly relevant to equipping scholars with the critical thinking, problem-solving and leadership skills they'll need to fulfill the program's vision of creating positive social and economic change," Baxter says.

Baxter enjoys seeing the scholars' interest in sustainability pique. She reports that several are now considering minoring in sustainability, recognizing its potential to set them apart from peers and prepare them for leadership roles in their chosen fields.

"A scholar who returned to Ghana for the summer recently sent me an email asking whether – if the internet options at home were good enough – she could take an online sustainability class over the break," says Baxter. "To me, this is clear evidence that the course is having the kind of impact we'd hoped."

Study Abroad

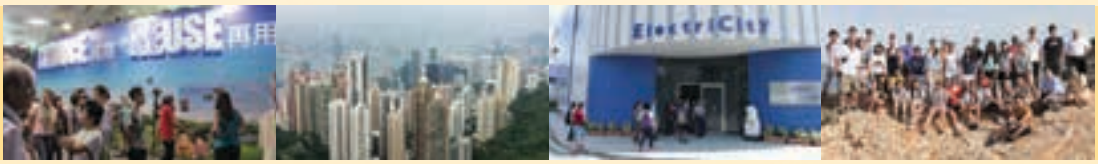
In 2014, 54 School of Sustainability undergraduate students studied abroad, including 51 who participated in programs offered through the Walton Sustainability Solutions Initiatives' Global Sustainability Studies Program. An additional 20 sustainability graduate students participated through the Walton Initiatives.

Human Rights and Sustainability in Brazil Through site visits in Sao Paulo, Curitiba, Brasilia and the Amazon, students explored the complex connections between human rights to food, housing, control over resources, and a healthy environment, with issues of conservation, indigenous populations, environmental degradation, global consumption and climate change.

Sustainable Development across the Mediterranean in Spain and Morocco Students traveled through the historic cities and diverse countryside of Morocco and Spain, two countries with similarities in culture, architecture and religion as well as close but sometimes divisive economic and political ties. Here, students learned about issues of socio-economic disparity, politics, policies and sustainable development challenges in complex and differing contexts.

Connecting with Communities in the Developing World: Trinidad & Tobago In this project-based visit to the twin island republic of Trinidad and Tobago, students worked on environmental projects including ocean wave-energy harvesting, prevention of soil erosion and producing biofuels from tropical vegetation. Students learned about issues of socio-economic contrasts, politics and sustainable energy challenges in the Caribbean.

Sustainable Solutions for Mobility and Accessibility in the Netherlands
Students met with professionals from various city departments, advocacy groups and entrepreneurs to learn first-hand about the process of implementing solutions such as bike- and pedestrian-friendly infrastructure, solar-powered cars and public transit, car- and bike-sharing programs, and transit-oriented urban development.



Urban Sustainability in Hong Kong Hong Kong was the setting of an urban case study allowing students to analyze sustainability in one of the world's largest metropolitan areas. Students learned how cities formulate and apply public policy to the challenges of local sustainability, such as greenhouse gas emissions, renewable energy, alternative transportation, water management and community resilience.

Students in the Spotlight

Sustainability grad student attends UN climate negotiations

Just before her graduation in December, MSUS student Megan Barry attended the historic COP 20 – the 20th session of the Conference of the Parties to the Kyoto Protocol, hosted by the United Nations Framework Convention on Climate Change. She attended as a research assistant and joined conference sessions pertinent to her work.

Grad student leads mural project in Phoenix Balsz neighborhood

Building on her twenty-plus years of experience in the arts and social engagement, Angela Cazel-Jahn pursued her MSUS degree with a focus on communications. Her capstone project was a participatory art installation along the Grand Canal Trail, created by the community and intended to simplify sustainability concepts and stimulate conversation about them.

ASU team wins third place in national entrepreneurship competition

Sustainability undergraduate students Akane Ota and Bridget Harding, along with engineering master's students Shota Okutsu and Vidyacharana Ramesh, finished third out of 60 teams at the Carnegie Mellon Venture Challenge for their fashion watch with an alarm and GPS tracking, developed as a personal security device for women.

Dissertation work influences water management policy in Costa Rica

Doctoral student Ben Warner used his research findings – that drought and international trade liberalization treaties have had a major impact on small farmers, making them vulnerable to global changes – to refine current water management policy in the rural, semi-arid region of northwestern Costa Rica.

Student venture wins ASU Innovation Challenge

Numerous School of Sustainability students are among the founders of GreenLight Solutions, which was one of 11 teams awarded financial support by the 2014 ASU Innovation Challenge. GreenLight Solutions enables sustainability-minded students to utilize their knowledge through experiential learning to help organizations in need of innovative, cost-effective strategies to embrace sustainability.

ASU engineering team is one of 16 selected for EcoCAR 3 competition

A team of automotive-engineering students at ASU's Polytechnic campus was selected to participate in EcoCAR 3, a competition launched by the U.S. Department of Energy and General Motors Co. that represents an effort to bring the automotive industry into a cleaner energy future.

Student tracks drought conditions using cosmic-ray sensor

Using a solar-powered sensor that determines soil moisture measurements through cosmic rays, ecohydrology graduate student Adam Schreiner-McGraw measured water availability in regions of Arizona, New Mexico and Mexico in order to assess the impacts of land cover and climate change.

Former SCENE student attends Nobel Prize ceremonies

ASU freshman Sarah Galvin's award-winning research on next-generation electronics was made possible through the ASU Wrigley Institute's Southwest Center for Education and the Natural Environment and secured her a ticket to the Nobel Prize ceremonies in Stockholm.

Alumni community gathers in the garden

What's better than spending a beautiful day outside helping those in need? If you answered playing video games in front of your 65-inch television, then this opportunity probably isn't for you.

If you enjoy gorgeous mornings outdoors, helping others and Sun Devil spirit, though, read on. The School of Sustainability Alumni Chapter hosts a garden maintenance day at the Escalante Community Garden in Tempe the second Saturday of every month during the school year, and you're invited.

Produce grown at the garden goes into emergency food boxes for local residents in need. And you never know what you might take home from the garden. It could be information on a job opportunity, a new gardening technique or maybe a new friend. **Join us!**

Stephanie Quintero
Events and Alumni Relations
School of Sustainability
sos.asu.edu/alumni

Champion of [and for] the World

Photo: Josh Larson

With her son in tow, Christa Brelsford showed up to practice before the 2014 IFSC Paraclimbing World Championship competition. She was turned away at the door – no babies allowed.

"So," says Brelsford, "I practiced on the birthday party wall and impressed all the six-year-olds."

If you spend any time with Brelsford, who graduated in summer 2014 with a doctoral degree from the School of Sustainability, you'll get the sense that this is a supremely practical person with a strong sense of self. Though her path is sometimes unconventional, Brelsford's internal compass is guided by one innate desire – to be a champion for good in the world.

Brelsford entered college at age 16, with a full scholarship to Simon's Rock University. She graduated with a bachelor's degree in physics. Then she went on to Columbia University to earn a bachelor's in civil engineering and a master's in climate and society.

Amidst academic studies, Brelsford climbed every rock from Alaska to New York. She also taught preschool, completed an immersive language program in Guatemala, and seized opportunities to help others.

It was one such opportunity that brought Brelsford to Haiti in 2010. She was spending her winter break in Port-au-Prince, volunteering with her brother on an adult literacy project. When a 7.0 magnitude earthquake struck, Brelsford was trapped under debris. She lost her leg, but felt lucky to be alive, as she told the TODAY show and other media outlets from the Jacksonville, Florida hospital where she had been evacuated for care.

After recovering from surgery, Brelsford was fitted with a prosthesis. Her experience had brought a bit of celebrity, which she has used to spotlight the needs of the Haitian people when appropriate.

At the time of the earthquake, Brelsford was a sustainability student at ASU. She had enrolled in the program after meeting Christopher Boone, now dean of the School of Sustainability, at a green jobs fair in 2007. She focused her doctoral studies on Colorado River water – water infrastructure, water demand, water rights and optimal water distribution. The School of Sustainability provided the support that allowed her to blend her diverse expertise and experience to work on real-world solutions.

Today, Brelsford is working to collect and formalize data on the properties of slums worldwide, and to analyze that data in a statistically rigorous way. In these informal neighborhoods – with no certainty about how many people live there and no roads to provide access – there are often no formal city services. "If you can reorganize the neighborhood enough to get vehicles in," says Brelsford, "the cost of providing services goes down."

In July 2014, Brelsford won her division of the first-ever USA Paraclimbing National Championships. In September, she was in Spain representing her country at the world championships, where she won her division – despite having to practice on the kiddie wall.

Even with her world champion status, Brelsford's mission remains unchanged.

"My biggest goal in life is to use careful thought to do good in the world," she says. "I was in Haiti to learn how to help, and I research and study sustainability for the same reason."

Expanded Program Offerings

In 2014, ASU and the School of Sustainability continued to expand offerings through new degrees and programs.

Professional Training and Custom Sustainability Education

The Julie Ann Wrigley Global Institute of Sustainability hired Ryan Johnson to lead a new initiative to provide non-degree professional training and custom education programs for small or large groups. The programs may be delivered in-person, online or a hybrid of both, and may consist of brief modules or multi-day sessions, tailored to an organization's needs.

Executive Master of Sustainability Leadership

The program welcomed its first cohort, consisting of students from Nigeria, the Netherlands, Canada and across the United States. The 13-month program, offered by the Rob and Melani Walton Sustainability Solutions Initiatives and the School of Sustainability, features a mix of online courses and in-person workshops that equip professionals to lead transformative and sustainable change in their respective organizations.

Concurrent Degree Arrangements with the Master of Sustainable Solutions

The School of Sustainability created a suite of concurrent master's degree arrangements between its Master of Sustainable Solutions and other ASU programs, including the Master's in Urban and Environmental Planning, Master's in Public Programs, Master's in Public Affairs, Master's in Legal Studies and the Master of Mass Communication.

Sustainability Concentrations Offered Online

ASU began to offer more sustainability courses online, which made it possible for the Bachelor's in Interdisciplinary Studies with a concentration in sustainability and the Bachelor of Arts in Business with a concentration in sustainability to be pursued through ASU Online.

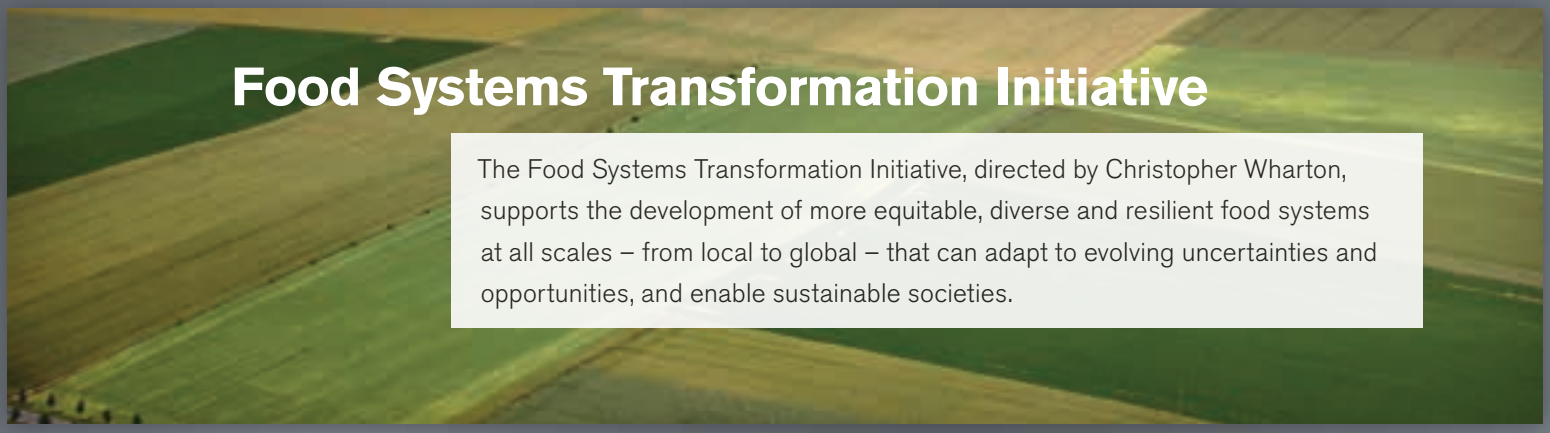
Undergraduate Certificate in Energy and Sustainability

The focus of this interdisciplinary certificate is on examining current affairs of energy, and what it will take to create a sustainable energy future. In particular, it is intended to equip students with a strong understanding of the energy landscape from both social and technical perspectives.

Undergraduate Certificate in Food System Sustainability

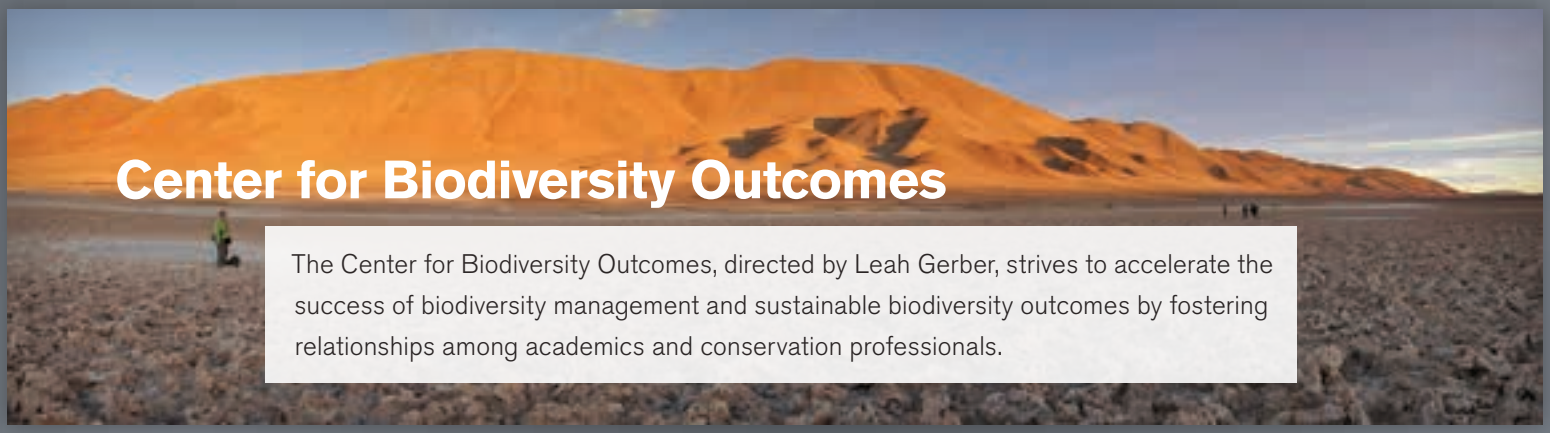
This certificate is a comprehensive, sustainability-oriented introduction to food systems, designed to complement a variety of majors. The program draws from food-related courses in the social sciences, humanities, life sciences and applied sciences to give students a holistic understanding of food-related challenges and solutions.

New Sustainability Centers and Initiatives



Food Systems Transformation Initiative

The Food Systems Transformation Initiative, directed by Christopher Wharton, supports the development of more equitable, diverse and resilient food systems at all scales – from local to global – that can adapt to evolving uncertainties and opportunities, and enable sustainable societies.

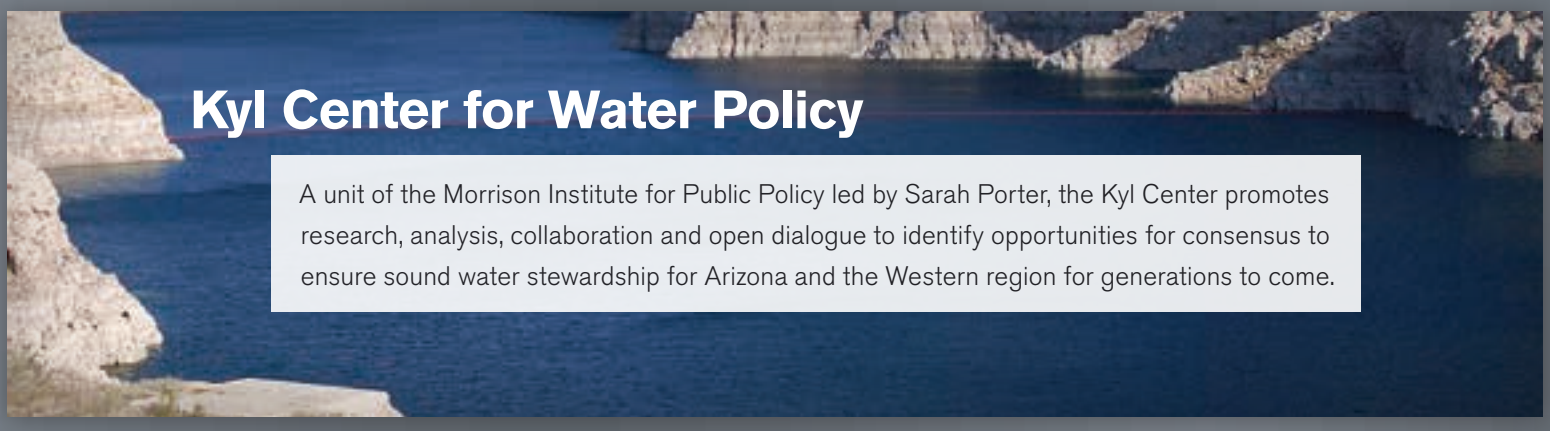


Center for Biodiversity Outcomes

The Center for Biodiversity Outcomes, directed by Leah Gerber, strives to accelerate the success of biodiversity management and sustainable biodiversity outcomes by fostering relationships among academics and conservation professionals.

Center for Biosocial Complex Systems

A partnership of ASU and the Santa Fe Institute co-directed by Sander van der Leeuw and Manfred Laubichler, this center advances understanding of problems that span biological and social systems and is poised to become a major international incubator of solution-driven transdisciplinary research.



Kyl Center for Water Policy

A unit of the Morrison Institute for Public Policy led by Sarah Porter, the Kyl Center promotes research, analysis, collaboration and open dialogue to identify opportunities for consensus to ensure sound water stewardship for Arizona and the Western region for generations to come.

Resilience, Sustainability and Social Justice

David Eisenman

Suddenly it seems to me that the whole world is talking about sustainability and resilience. In the field of disasters – my field – both are important concepts, complementary to each other and worthy of action and resources.

But frequently missing from the discussion is one of the most important determinants of sustainability and resilience – social justice. Social injustice – or the inequitable access to resources and allocation of risks, benefits and burdens – accounts for much of the suffering after disasters.

Because of inequities in social conditions – education, employment, housing, transportation – the poor and disenfranchised are disproportionately affected by disasters. In a typical disaster, much of the public expenditure of labor, money and other resources is spent dealing with the marginalized and disenfranchised segments of society, who suffer greatly and lack the personal resources for response and recovery.

Any sustainable solution to disasters must address not only the physical disaster, but also create the means for society's most vulnerable individuals to be resilient. To accomplish this, I prioritize community engagement. Within these marginalized groups is vital social capital – local knowledge, skills, trust and connections that are resources in building and maintaining resilience.

Within these marginalized groups is vital social capital – local knowledge, skills, trust and connections that are resources in building and maintaining resilience.

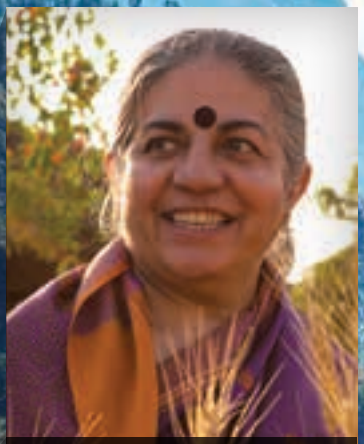
I work to network community organizations with government agencies. I try to identify the resources people use on a daily basis. I reduce barriers to available resources. But how do I know that the work I do to build a community's resilience will be sustained after I and my team depart? This falls into the arena of policy and sustainable development.

Resilient communities, like resilient individuals, can harness the resources they need to sustain well-being. As global climate change marches on and the human footprint on the planet increases, it is resilient communities that will sustain. Social justice is fundamental to progress.

David Eisenman directs the Center for Public Health and Disasters at UCLA. He and his team are collaborating with ASU to model how variations in the built environment and the provision of energy can reduce deaths and hospitalizations from heat waves.

Adapted from a longer essay. Read the full version at ***sustainability.asu.edu/thought-leader****.*

In Defense of the Earth and Women's Rights



Vandana Shiva

Over the last four decades, I have served grassroots ecological movements, beginning in the 1970s with the historic Chipko Movement in my region of Central Himalaya. In every movement I have participated in, it was women who led the actions, and women who sustained actions to protect the earth and the sources of their sustenance and livelihoods.

Women of Chipko wrapped themselves around trees to protect them from industrial logging that was leading to floods, droughts, landslides and other disasters. By 1981, thanks to the actions of these women, the Indian government was compelled to stop logging in the Central Himalaya.

In 2002, I was invited by women from a small hamlet called Plachimada to join their protest at the gates of the local Coca Cola plant, which was mining their water supply. As their water sources dried up and their wells became polluted, women were forced to walk many miles for clean drinking water. In 2004, Coca Cola was ordered to stop drawing water for commercial purposes.

Why do women lead ecology movements? I believe it is because, in the sexual division of labor, women have been left to look after sustenance – providing food and water, health and care. When it comes to the sustenance economy, women are both the experts and providers.

The women of Chipko taught us that timber, revenue and profits were not the real products of the forest.

The patriarchal model of the economy is dominated by one figure – the GDP. The dominant paradigm of forestry is based on monocultures of commercial species. Forests are seen as timber mines, producing timber, profits and revenue.

The women of Chipko taught us that timber, revenue and profits were not the real products of the forest. The real products were soil, water and pure air. Today, science refers to these as ecological functions of ecosystems. Illiterate women of the Himalaya were four decades ahead of the scientists of the world.

Vandana Shiva, originally a theoretical physicist, is an environmental activist, author and expert in ecofeminism. She presented a Wrigley Lecture during the Fall 2014 semester.

Adapted from a longer essay. Read the full version at ***sustainability.asu.edu/thought-leader****.*

Building Cities that Celebrate Life

William McDonough

We live in the age of cities, in the midst of the most dramatic transformation of urban life and the urban landscape the world has ever seen.

Urbanization on a global scale has happened in a heartbeat. It took more than 5,000 years of human development for the world's urban population to approach one billion, in the early 1960s. But by 2030, according to the latest United Nations estimates, five billion people will live in cities.

This global urban boom presents formidable challenges, but it also offers extraordinary opportunities for regenerative urban growth—growth that supports healthy communities, thriving ecosystems and productive, vigorous economies in cities old and new.

I'm very excited to be working with the Municipality of Haarlemmermeer, in the Netherlands. Together with Delta Development, we designed the first large-scale Cradle to Cradle®-inspired urban development in the country, Park 20|20.

This global urban boom presents formidable challenges, but it also offers extraordinary opportunities for regenerative urban growth.

Park 20|20 supports sustainable growth by enhancing the positive, productive effects of good design. Rather than seeking to simply minimize the negative environmental impacts of real estate development, it celebrates the use and re-use of safe, healthy materials; the generation and harvesting of renewable energy, food, clean water and oxygen-rich air; the restoration of ecological health and biodiversity.

People are finding that it is a wonderful place to be. Fresh air, sunlight and water are plentiful. The environment, indoors and out, is beautiful, comfortable and safe. People have easy access to gardens, parks, waterways and transit, as well as new ideas, knowledge and a creative, innovative community. There are markets and theaters, athletic fields and restaurants. And more.

That's the bounty cities can offer when they're designed to celebrate life. And when they are, cities can perform the essential service of 21st century urbanism: creating regenerative buildings and landscapes that produce more good for more people rather than places that are merely less bad. More clean energy, more fresh water, more fertile soil, more food, more productivity, more biodiversity—more health and well-being for all.

William McDonough is a globally recognized designer, thought leader, author, sustainable growth pioneer—and a member of the Board of Directors for Sustainability at ASU.

Adapted from a longer essay. Read the full version at ***sustainability.asu.edu/thought-leader****.*

Exploring the Politics and Practice of Indigenous Sustainability

Rebecca Tsosie

Most experts agree that Indigenous peoples are among the most vulnerable populations in the world to the projected impacts of climate change. The question is how global nation-states should respond. One approach places Indigenous peoples at the center of sustainability studies, and one relegates them to the periphery.

Indigenous peoples have survived as separate and distinct nations within often-challenging natural, political and economic environments precisely because they maintain cultural values consistent with sustainability. For most Indigenous peoples, sustainability is the result of conscious and intentional strategies designed to secure a balance between human beings and the natural world and to preserve that balance for the benefit of future generations.

Federal and state agencies within the United States, which maintain a trust relationship with over 560 federally-recognized American Indian and Alaska Native Nations, ought to consult with tribal governments as they develop sustainability policies for the future.

The place of Indigenous peoples within the politics and practice of sustainability has a substantive dimension that is deeply rooted within Indigenous cultures.

All too often, tribal consultation protocols become a procedural requirement, overlooking the substantive value of involving tribal governments in policy design. In fact, the place of Indigenous peoples within the politics and practice of sustainability has a substantive dimension that is deeply rooted within Indigenous cultures. For this reason, Indigenous sustainability might be better positioned at the center of sustainability studies.

Today, many scientists study Indigenous traditional knowledge to document climate change and design adaptation strategies. However, it is necessary to realize that Indigenous traditional knowledge systems are holistic in nature and thus, can only be appropriately governed by each Indigenous group. They should not be mined for only those bits of information that are perceived to benefit the entire world.

The dialogue about sustainability must be generated from within Indigenous thought systems, as well as from within Western thought systems, and the interchange must proceed from a platform of respect and mutual engagement. This type of intercultural sharing between and among diverse peoples will open new opportunities to discover our potential as human beings in an ever-changing natural world.

Rebecca Tsosie is a senior sustainability scientist, Regents' Professor of Law and Vice Provost of Inclusion and Community Engagement at Arizona State University.

Adapted from a longer essay. Read the full version at ***sustainability.asu.edu/thought-leader****.*

Sustainable Agriculture: The Future is Biological

Anthony Michaels

As the world population grows to nine billion people, we face many fundamental questions. How can we improve agricultural production to feed that many people? How can we reduce climate impacts, minimize the nitrogen runoff that creates dead zones in oceans and reverse soil erosion? I believe that a big part of the answer is biological agriculture.

In the middle of the twentieth century, chemical agriculture methods became the norm, more than doubling crop yields. We now realize that these improvements came at a cost. These methods, when used in excess, are expensive and damaging to the environment, and they also damage microbial soil life – thus limiting long-term soil fertility and the services that biology can provide.

Organic farming, which is inherently biological, also has its limits. A good organic farmer requires a substantial training investment, and not all soils or cropping systems are suited to organic production.

Biological farming is an intermediate between conventional and organic – a thoughtful systems approach. Biological farmers have the ecosystem provide services for free that the farmer would otherwise pay for through the use of chemistry or equipment.

Biological farmers test and then balance their soil by applying a wide range of minerals. They feed microbial soil life by using carbon from compost, manure and crop residues. They carefully manage crop rotations, apply pesticides and herbicides sparingly, and use tillage practices that preserve healthy soil structure.

Because biological farmers work with nature instead of fighting it, the environmental benefits are enormous.

The end result is a diverse, healthy ecosystem that produces higher yields at lower costs. And, because biological farmers work with nature instead of fighting it, the environmental benefits are enormous: substantial reduction in carbon footprint, increased drought resistance, improved water usage, reduction or elimination of nutrient runoff and rebuilding of soils to counteract erosion.

Bringing biological farming into the mainstream and changing agriculture as we know it – this is a challenge worthy of all of us.

Tony Michaels is an internationally known biologist and oceanographer. He is a member of the Board of Directors for Sustainability at ASU.

Adapted from a longer essay. Read the full version at ***sustainability.asu.edu/thought-leader****.*

An estimated 10 million species of "higher" organisms remain unknown to science, and the number of unknown microbial species could be even greater. Given this, the hubris of **writing laws and regulations to protect endangered species is laughable**. How can we adapt agriculture to climate change or understand complex ecosystems while remaining ignorant of 90 percent of their functional parts? What we need to do is invest in a mission to learn all species.

Quentin Wheeler, *President, SUNY College of Environmental Science and Forestry*

What will happen when the world's population expands to a predicted nine billion people? Will the people on this planet willingly forego a higher quality of life and the level of consumption that goes with it? Not likely. **We must find a way to maintain a high quality of life while consuming vastly fewer resources**. For companies, this will mean increasing the value of their products and services while reducing their resource footprint.

Kasper Rorsted, *Chief Executive Officer, Henkel*

Business is probably the only institution on the planet that is nimble and well-managed enough to respond to the global sustainability crises facing humanity. Companies that are sustainability leaders have higher and faster growing stock value, better financial results, lower risks and more engaged workforces than other companies. **Today's students need to graduate with solid sustainability skills**, not only to help save our environment, but also because this is where tomorrow's jobs will be.

L. Hunter Lovins, *President, Natural Capitalism Solutions*

Sustainability is what turns big cities into great cities. Phoenix has long benefited from visionary leaders with long-term outlooks. But we can't stop now. We must continue long-term thinking and planning or we will not thrive in the future. **Unless we get sustainability right in our own backyards, we won't be able to thrive and compete in the world around us**. We must rise to the occasion, inspire sustainability at an urban scale and help each other succeed.

Greg Stanton, *Mayor, City of Phoenix*

Excerpted from essay contributions to the Thought Leader Series. Read more at ***sustainability.asu.edu/thought-leader****.*

Partners in Change

ASU research has purpose and impact. By engaging with people and issues locally, nationally and internationally, ASU catalyzes social change and connects with communities through mutually beneficial partnerships.

Economic growth alliance

The Walton Sustainability Solutions Initiatives became the newest of 23 internationally renowned members belonging to Volunteers for Economic Growth Alliance (VEGA) – a nonprofit committed to improving life through the development and implementation of USAID-funded programs focused on energy, water, agriculture and economic development across the globe.

Sustainable education in Albania

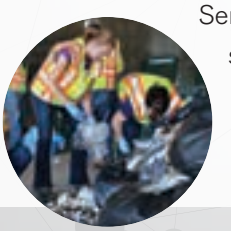
Assisting Albania's transition to sustainable national education, Walton Initiatives' Global Sustainability Solutions Services formed a partnership with the country, harnessing ASU's extensive resources to complete a cost-benefit analysis of energy efficiency in the country's public schools.

Supply chain summit in Berlin

In an effort to confront the challenges of product sustainability, The Sustainability Consortium and the Product Environmental Footprint World Forum joined forces at a combined summit meeting in Germany to address supply chain hotspots.

SRP waste diversion solutions

Wanting to maximize its waste diversion potential, increase the amount of materials recycled and reduce the environmental impact caused by its landfill, Salt River Project engaged the expertise of the Walton Initiatives' Sustainability Solutions Services to conduct a study that resulted in six waste reduction solutions that would divert an additional 866 tons of waste over 10 years and mitigate 79 metric tons of CO_2 emissions.



Sustainable development in the Netherlands

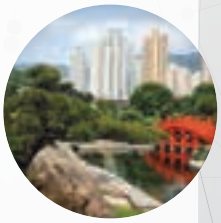
With the help of the Rob and Melani Walton Sustainability Solutions Initiatives, the Netherlands' municipality of Haarlemmermeer is working to create the world's first regional plan based on the principles of a circular economy, which closes loops related to water, energy, matter and other resources in the most efficient, economical and sustainable manner possible.

Water management in Brazil

The Decision Center for a Desert City began a cooperative project with Inter-American Development Bank to develop and operationalize an integrated set of tools and best practices that will support the state of Pernambuco, Brazil, in achieving an optimized water management and supply strategy that deals with climate variability and change, particularly droughts and floods.

Research collaboration in Japan

ASU's Decision Center for a Desert City initiated a new collaboration with the Research Institute for Humanity and Nature (Japan). ASU hosted an RIHN visiting scholar for two months in fall 2014. DCDC's co-director, Dave White, traveled to Kyoto in September to present an invited talk to the First International Symposium on Knowledge Translation: Bridging Gaps between Science and Society.



Trash into Treasure

With over four million residents, Arizona's Maricopa County has a lot of waste, and it only diverts 16 percent of it out of landfills, compared to the national average of 34 percent. City of Phoenix Mayor Greg Stanton charged his public works department with achieving 40 percent diversion by 2020, an initiative called Reimagine Phoenix.

In early 2014, the Phoenix city council gave policy approval to work with ASU on a groundbreaking public/private sustainability incubator focused on converting waste and other resources into economic value. The resulting Resource Innovation and Solutions Network, managed by the Walton Initiatives' Sustainability Solutions Services, began as a network of researchers, practitioners, organizations and businesses committed to finding uses for Phoenix's waste, creating economic value and driving a sustainable circular economy.

During the course of 2014, the network grew to include its first global partner, Sustainability School Lagos, in Nigeria. The ASU-Nigeria partnership was established to improve sanitation infrastructure in the rapidly growing city of Lagos, home to more than 20 million people.

ASU helps Nigerian leaders to create sustainability school in Lagos

Childhood friends and prominent Nigerian community leaders Olasupo Shasore, Olufemi Olarewaju and Adeyemi Adewole wanted to create a new knowledge center capable of tackling the sustainability challenges of their hometown, Lagos.

While conducting research on international sustainability institutions, Olarewaju came across ASU's Julie Ann Wrigley Global Institute of Sustainability, the nation's leader in interdisciplinary sustainability research and home of the School of Sustainability. The three friends used ASU as a basis for Sustainability School Lagos.

ASU's Global Sustainability Solutions Services is helping to make Sustainability School Lagos a reality by crafting a design and feasibility study that outlines curriculum, identifies educational needs, pinpoints knowledge gaps, inventories surrounding resources, and finds major sustainability themes and transition opportunities.

Tools and Touch Points

Sustainability scientists contribute at United Nations negotiations

A UN conference in Peru was effectively the world's last chance to get issues on the table before an international climate agreement is signed in Paris in 2015. Representatives from virtually every country in the world were in attendance, and among them were three ASU sustainability scientists. Daniel Bodansky, Kevin Gurney and Sonja Klinsky brought their expertise to a conference that will have global implications for years to come.

Kids learn science and environmental stewardship

Among the many 2014 offerings of ASU's Ecology Explorers K-12 outreach program was an after-school program offered within Homeward Bound, a transitional housing community for women and children who have been homeless, evicted or are fleeing a domestic violence. ASU student interns provided lessons on topics ranging from the water cycle to microclimates to sustainability.

A dynamic visualization tool across multiple platforms

ASU's Decision Center for a Desert City completed a major revision and redesign of WaterSim, its signature multi-platform tool that simulates climate, hydrology, decision-making and policy options for the Phoenix metro area, presenting data in an easy-to-understand visual format.

Planning for our future Earth

Recognizing that cities are a critical component in the process toward global sustainability, ASU's Urbanization and Global Environmental Change program organized three international events in 2014, including a workshop in Vietnam and conferences in England and Taiwan. Among many other objectives, these international engagements allowed the sharing of ideas and best practices for transformation in an increasingly complex world.

Designing universities and programs to meet the needs of society

Several sustainability scientists, including Lee Hartwell, Netra Chhetri and Mary Jane Parmentier, presented at a symposium in Ecuador that brought together educators from around the world to discuss the design of higher education. Dialog addressed the place of science, technology and innovation, and the role of public policy in designing universities and programs.

ASU Wrigley Institute reaches Arizona teachers

For the tenth year in a row, the ASU Wrigley Institute had a presence at Arizona Forward's Earth Fest, a venue for local environmental education organizations to share their work with Valley teachers. Representatives from ASU's Ecology Explorers and Sustainability Science for Sustainable Schools programs were in attendance.

Scientists engage audiences worldwide

Pasqualetti proposes solutions at water symposium

At a symposium on U.S.-Mexico transboundary water issues, Sustainability Scientist Mike Pasqualetti proposed that land used for irrigated agriculture in the Imperial Valley of California be repurposed in favor of renewable energy development. Such a move would save water for other uses and decrease carbon emissions from conventional generation while providing an economic benefit.

Hartwell discusses wearable sensors at sustainable health forum

In 2014, ASU's annual Forum for Sustainable Health served as a kick-off for "Project HoneyBee," an ASU endeavor to develop wearable sensors that improve patient outcomes while reducing costs. At the event, Sustainability Scientist Lee Hartwell discussed the need to develop reliable technology that will have the greatest impact on medicine and give patients control of their own health.

Pearson promotes conservation through worldwide workshops

Sustainability Scientist David Pearson travels the world, holding frequent biodiversity workshops for children, adults and university students. During a July visit to Peru, Pearson shared concepts like critical thinking, the scientific method and sustainable biodiversity with workshop attendees. The goal of Pearson's workshops is to empower the natives of each country he visits to solve ecological problems in their own way.

Boone says equitable access to parks is about more than location

Christopher Boone, dean of ASU's School of Sustainability, presented his research at a symposium on park equity, held in Los Angeles. In his presentation, Boone noted that equitable distribution of parks is laudable but is insufficient to meet standards of justice. Understanding park equity requires an assessment of process, including the fairness of institutions, decision-making and representation.

Myint discusses interdisciplinary study of climate

Sustainability Scientist Soe Myint leads an interdisciplinary study of the impacts of urban infrastructure and vegetation on local and regional climate. His team uses diverse analytical techniques like remote sensing and numerical modeling to monitor climate in five urban areas. Myint discussed his work as part of a Land-Cover/Land-Use Change webinar series on urban interdisciplinary studies.

Wu inspires graduate socio-environmental scholars

As an invited speaker for the National Socio-Environmental Synthesis Center, Sustainability Scientist Jianguo "Jingle" Wu presented a keynote presentation on socio-environmental synthesis research. Socio-environmental synthesis is a new research approach addressing the complex interactions between humans and the ecosystems in which they live.

Inaugural festival celebrates sustainability solutions & community

Themed "It's time to find a better way," ASU's first Sustainability Solutions Festival gathered a variety of audiences – from families and the university community to film buffs and leaders of industry – for a weeklong celebration of sustainability from **February 17 - 22, 2014**

The festival, one of eight programs within the Rob and Melani Walton Sustainability Solutions Initiatives, kicked off with a kid-friendly Sustainability Solutions Family Day at the Arizona Science Center.

The event was followed by the sixth annual GreenBiz Forum, a three-day conference that attracts many of the world's largest companies and defines the latest trends, challenges and opportunities in sustainable business. A first-ever GreenBiz Forum shadow conference on ASU's Tempe campus live-streamed the event, allowing the ASU community to remotely attend.

Other festival highlights included the Sedona Green Film Festival, Arizona Solar Summit, a cultural celebration at Phoenix's historic Heard Museum and a Picnic in the Park – in the spirit of farm-to-table – with great food, activities and entertainment to conclude the week.

"The Sustainability Solutions Festival exemplifies ASU's endeavor to address the world's environmental, economic and social challenges of the twenty-first century through collaborative, transdisciplinary and solutions-oriented thinking and training," said Michael M. Crow, president of Arizona State University.

"As citizens of this planet, we have an obligation to future generations to embrace sustainability as a transformational core value in order to develop a society that is more environmentally sensitive, economically disciplined and socially just."

The 2014 Sustainability Solutions Festival was presented in partnership with global leaders in sustainable business, consumer innovation, renewable energy, science and the arts. Among them were GreenBiz Group, The Sustainability Consortium, Arizona Solar Summit, Arizona Science Center, Arizona SciTech Festival, Sedona Film Festival and the City of Tempe.

sustainabilityfestival.asu.edu

The Sustainability Solutions Festival recognizes the innovative spirit of sustainability community members by presenting the Walton Initiatives' Sustainability Solutions Awards at competitions and events locally, nationally and internationally.

INTEL INTERNATIONAL SCIENCE & ENGINEERING FAIR

Lewis Nitschinsk – *The Optimal Reclamation Point of Phosphate from a Wastewater Treatment Plant*

Hans Pande – *Sustainable Water Purification System with UV Irradiation*

Shreya Nandy, Kopal Gupta – *A Unique Kit for Detection and Removal of Pesticides from Fruits and Vegetables*

Naveena Bontha – *Removing Carbon Dioxide from our Atmosphere: Using Porous Crystalline Materials for CO_2 Capture*

CREATIVE NONFICTION: THE HUMAN FACE OF SUSTAINABILITY

WINNING ESSAY

Mary Heather Noble – *"Acts of Courage"*

WINNING ARTIST

Marcy Miranda Janes – *Hand-cut paper illustration*

FUTURE CITY COMPETITION, ARIZONA REGIONALS

Zachary Price, Nathan Randall, Reagan Gillispie – *Northside Homeschoolers*

Joseph Rice, Jessica Casillas, Jalen Salazar Reyes – *Maricopa Wells Middle School*

Jonathon Gonsalves, Ryan Tran, Truman Idso – *The Accelerated Middle School at Basha High*

Abdifatah Isse Aden, Hassan Jamal Ali, Husein Jamal Ali – *Sonoran Science Academy*

Alec Blomquist, Natalie Crisci, Jesse Kisiel – *Veritas Homeschoolers*

SEED SPOT DEMO DAY

Linda Knutson – *Innovative HITECH Healthcare Solutions*

Jason Bentz – *Guardian NPX*

Janette Harwell – *Box Play for Kids*

ASU CHANGEMAKER 10,000 SOLUTIONS PROGRAM

Katelyn Keberle – *Flash Food*

Jon Irons – *Sitgreen Furniture*


Sustainability
Solutions Festival
Sustainability
Solutions Festival
February 22 - 22, 2014
sustainabilityfestival.asu.edu

Engaging Arizona Audiences

The Julie Ann Wrigley Global Institute of Sustainability sponsors and promotes events throughout the year. In 2014, the institute sponsored more than 70 lectures, presentations, panel discussions and special events.

Advancing sustainability through humor and surprise

"Trout Fishing in America and Other stories" was an art exhibition funded in part by the ASU Wrigley Institute. It followed conservation biologists working to save endangered species in the Grand Canyon and conveyed the complex processes that govern the region's inhabitants.

The role of fiction as a means to a better future

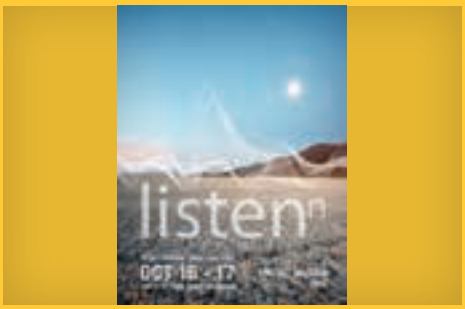
Award-winning author Margaret Atwood spoke on the roles of creative writing and imagination in addressing social and environmental challenges. Her visit marked the launch of the Imagination and Climate Futures Initiative, a collaboration among the Rob and Melani Walton Sustainability Solutions Initiatives, Center for Science and the Imagination and Virginia G. Piper Center for Creative Writing.

Water decisions in a complex policy landscape

ASU's Decision Center for a Desert City convened five Water/Climate Briefings in 2014, featuring panelists from city, county and state governments, private businesses, academia and more. Topics centered on the theme of "Communicating Sustainability in Complex Systems for Public Policy."

Groundbreaking indigenous sustainability conference

Inspired in part by the leadership of the ASU Wrigley Institute, the Conference on Indigenous Sustainability gathered indigenous scholars, sustainability scientists and tribal leaders in Tempe, Arizona to discuss the sustainability challenges facing indigenous communities.



Understanding sustainability through sound

The Listen^n Symposium, co-hosted by the ASU Art Museum and ASU Wrigley Institute, featured a series of panel discussions, musical performances and art installations that aimed to open participants' eyes to sustainability issues by opening their ears to the sonic environment.

Green growth as an approach to sustainability

A transcontinental conference that took place, in part, at ASU assembled the brightest minds in the arena of systemic solutions to global problems. The conference examined the robustness of a new approach to sustainability, termed "green growth."

US dignitaries talk sustainability

US Secretary of Agriculture speaks on 'homegrown energy'

Agriculture Secretary Tom Vilsack gave a Sustainability Series lecture during the fall semester. He discussed the renewable energy industry and its relationship to agriculture. He particularly focused on the critical role of research and innovation in ensuring that farmers can meet the needs for food, feed, fiber and biomass in a sustainable way.

US Secretary of Energy praises ASU's innovation

During a tour of Department of Energy-funded research projects at ASU, U.S. Secretary of Energy Ernest Moniz discussed the importance of engaging youth and minorities in STEM education. Acknowledging the almost $100 million in energy technology grants his department has awarded to ASU, Moniz said, "Arizona State is among the leaders in innovation in energy technology."

ASU's algae-based biofuels of interest to US Navy

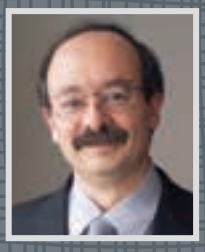
Dennis McGinn, U.S. Navy Assistant Secretary for Energy, Installations and Environment, visited ASU's Arizona Center for Algae Technology and Innovation (AzCATI) during the spring semester. McGinn expressed interest in partnering with the facility to tackle energy use and reliability concerns.

US Secretary of the Navy discusses energy security

During a brief stopover in Arizona, which included a visit to the Yuma Naval and Marine Base, U.S. Secretary of the Navy Ray Mabus gave a Wrigley Lecture Series presentation to a packed house. Mabus discussed the global presence of the Navy and Marine Corps and its importance in maintaining and promoting energy security.

2014 Distinguished Wrigley Lecturers

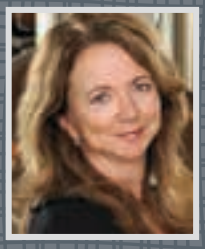
Gary Hirshberg
Chairman of the board and former CEO of Stonyfield Farm



Amory Lovins
Co-founder and chief scientist at Rocky Mountain Institute

Julian Agyeman
Professor at Tufts University and co-founder of *Local Environment: The International Journal of Justice and Sustainability*

Ray Mabus
The 75th U.S. Secretary of the Navy



Kim Jordan
CEO and co-founder of New Belgium Brewing Company

Vandana Shiva
Author, activist, pioneer, scientific advisor and mother

Watch the videos at ***sustainability.asu.edu/wrigley-2014***.

In the News

ASU listed in the Princeton Review's Guide to 332 Green Colleges

Arizona State University was listed in The Princeton Review's *Guide to 332 Green Colleges: 2014 Edition*. ASU was recognized for its solar installations, LEED-certified buildings and its signature Campus Harvest program.

College Planning & Management magazine features ASU's sustainability efforts

The August 2014 issue of *College Planning & Management* magazine includes the feature article, "Greening the Desert," about some of the operational procedures and programs that Arizona State University employs in pursuit of its climate neutrality goals.

Business Officer magazine highlights ASU's progress toward carbon neutrality

A cover story in the June 2014 issue of *Business Officer* magazine examines carbon neutrality commitments on college campuses, and features ASU's noteworthy advancements as examples of a growing trend toward alternative energy.

Climate Neutrality

Solar photovoltaic canopies totaling 1,039 kWdc were completed in August over Parking Lot 55, bringing ASU's total covered parking spaces to nearly 6,000.

Zero Waste

The Clinton Global Initiative University conference held at ASU in 2014 achieved an average waste diversion rate of 96.9 percent.

Active Engagement

Attracting more than 7,000 ASU community members, the Farmers Market @ the ASU Tempe campus produced gross sales of $103,000 in fiscal year 2014.

Principled Practice

Grounds Services reclaimed more than 1.7 million gallons of water from the Central Plant water capture project for power washing campus streets and malls.

Read the sustainability operations annual review at **zerowaste.asu.edu**.

University Achievements

Top U.S. University Think Tank
Consortium for Science, Policy and Outcomes
2014 Global Go To Think Tanks Report

Food Recovery Challenge Certificate of Achievement
Arizona State University
U.S. Environmental Protection Agency

Governor's Award for Energy Excellence
Tempe Union High School District, in partnership with ASU Sustainable Schools program
Arizona Governor's Office of Energy Policy

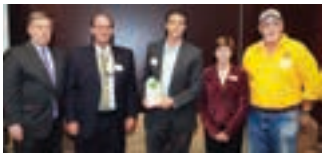
Community Engagement Classification
Arizona State University
Carnegie Foundation for the Advancement of Teaching

Gold-Level Bicycle Friendly University
Arizona State University
League of American Cyclists

2014 ASU President's Award for Sustainability

The President's Award for Sustainability recognizes ASU teams that have demonstrated excellence in fostering the successful development, implementation and promotion of sustainability principles, solutions, programs and services that support the university's teaching, learning, research and business missions.

ASU Green Labs
For actively engaging more than 450 lab employees and students and 13 ASU schools and departments in sustainable laboratory practices.



B99 Biodiesel Fueling Station
For recycling fryer oil used by campus vendor Aramark into a carbon-neutral biofuel that is used to power ASU maintenance vehicles and equipment.

ASU Solarization Program
For its 86 solar systems across four campuses, producing 23.5 MWdc of clean, renewable electrical power at ASU.

SRP Waste Diversion Program
For their recommendations that could divert 866 tons of waste from the landfill over 10 years, reducing emissions and hauling costs and increasing revenue.

Research Proposals and Awards

In 2014, the Julie Ann Wrigley Global Institute of Sustainability's proposal support team submitted 77 proposals totaling over $63.5 million. Of those, 33.3 percent were successful, for a total of over $18 million.

ASU JULIE ANN WRIGLEY GLOBAL INSTITUTE of SUSTAINABILITY
ARIZONA STATE UNIVERSITY

CHRISTOPHER BOONE

$293,504 – *U.S. Agency for International Development*

USAID Global Development Lab Research and Innovation Fellowship at Arizona State University

NALINI CHHETRI

$125,000 – *Arizona Department of Health Services*

Arizona BRACE

$18,656 – *LightWorks and Strategic Solar*

Micro-climate Effects of ASU Solar Canopies over Different Surfaces

$98,443 – *National Oceanic and Atmospheric Administration*

Informing Emergency and Risk Management Climate Knowledge in Arid Regions

LEAH GERBER

$100,000 – *ASU Foundation*

Developing Decision Support Tools for Sustainable Water Infrastructure

CORRIE GRIFFITH

$58,000 – *Univerisity of Stockholm*

Critical knowledge pathways to livable urban futures

JENNIFER HODBOD

$495,041 – *CGIAR*

Using rangeland management to create resilient livelihoods in Ethiopia

ALEX MAHALOV

$485,521 – *Air Force Office of Scientific Research*

Non-Paraxial Propagation through Strongly Inhomogeneous Ionospheric Turbulence: Solving the 3D Stochastic Maxwell's Equations

ROB MELNICK

$106,671 – *Open Society Foundation*

Albania's Sustainable Future: Energy Efficient Green Schools

DAN O'NEILL

$60,000 – *Ray C. Anderson Foundation*

Sustainable New Product Development

$1,999,999 – *City of Phoenix*

Resource Innovation and Solutions Network (RISN)

CHARLES REDMAN*

$11,999,692 – *National Science Foundation*

Urban resilience to climate change-driven extreme events

JOHN SABO

$848,071 – *National Science Foundation*

Collaborative Research: Effects of flow regime shifts, antecedent hydrology, nitrogen pulses and resource quantity and quality on food chain length in rivers

THOMAS SEAGER

$1,949,788 – *National Science Foundation*

Collaborative Research: RIPS Type 2: Resilience Simulation for Water, Power & Road Networks

PHILIP TARRANT

$17,003 – *National Science Foundation*

EAGER: Collaborative Research: Conceptualizing sustained environmental information management in the landscape of current and emerging eco-informatics infrastructure

CHRISTOPHER WHARTON

$23,263 – *U.S. Department of Agriculture*

Food system sustainability in the southwest: Developing a regional action plan to enhance resilience, livelihoods, and food security across New Mexico and Arizona

*Recommended for funding pending final approval

Sustainability Research **across the University**

Sustainability research takes place across the university every day. ASU's community of sustainability scientists and scholars now numbers over 300 and includes faculty and researchers from colleges and departments across the university and beyond. We recognize and honor their successes of 2014.

Recognition and Honors

ARIEL ANBAR, *School of Earth and Space Exploration and the Department of Chemistry and Biochemistry*

Howard Hughes Medical Institute Professor

GARY DIRKS, *Julie Ann Wrigley Global Institute of Sustainability*

Member, Governor's State Energy Advisory Board

JANET FRANKLIN, *School of Geographical Sciences and Urban Planning*

President, International Association for Landscape Ecology, U.S. National Chapter

Member, National Academy of Sciences

MARK HENDERSON, *Polytechnic School*

Making a World of Difference Award, Tempe Sister Cities

LAWRENCE KRAUSS, *Department of Physics, College of Liberal Arts and Sciences*

Laureate, International Academy of Humanists

T. AGAMI REDDY, *The Design School and the School of Sustainable Engineering and the Built Environment*

Yellott Award, American Society of Mechanical Engineers, Solar Energy Division

STUART LINDSAY, *Biodesign Institute, the Department of Physics and the Department of Chemistry and Biochemistry*

University Professor, Arizona State University

Fellow, National Academy of Inventors

SETHURAMAN PANCHANATHAN, *Office of Knowledge Enterprise Development*

Member, U.S. National Science Board

Member, National Advisory Council on Innovation and Entrepreneurship

BRUCE RITTMANN, *Biodesign Institute and the School of Sustainable Engineering and the Built Environment*

ISME/IWA Bio Cluster Award, International Water Association and the International Society of Microbial Ecology

EMILY TALEN, *School of Geographical Sciences and Urban Planning*

Fellow, Guggenheim Foundation

ENRIQUE VIVONI, *School of Earth and Space Exploration*

Walter L. Huber Civil Engineering Research Prize, American Society of Civil Engineers

Leopold Leadership Fellowship, Woods Institute for the Environment, Stanford University

ELIZABETH WENTZ, *School of Geographical Sciences and Urban Planning*

President-elect, University Consortium for Geographic Information Science

PAUL WESTERHOFF, *School of Sustainable Engineering and the Built Environment*

Vice Provost of Academic Research Programming, Arizona State University

Selected Grants and Awards

BECKY BALL

$126,110 – National Science Foundation

Climactic and Environmental Constraints on Aboveground-Belowground Linkages and Diversity across a Latitudinal Gradient in Antarctica

MARIANA BERTONI

$400,000 – U.S. Department of Energy

NeoGrowth: Technology for a Novel Silicon Ingot Growth

NADYA BLISS

$20,000,000 – National Geospatial Intelligence Agency

The Foresight Initiative

STUART BOWDEN

$900,000 – U.S. Department of Energy

Replacing Silver with Copper in the Manufacturing of Solar Energy Cells

DAN BUTTRY, PI

Co-PIs **Cody Friesen**, Vladimiro Mujica and **Ellen Stechel**

$2,900,000 – U.S. Department of Energy

Developing an Efficient and Cost-Effective Carbon Capture Technology Using an Innovative Electrochemical Technique

MIKHAIL CHESTER

$599,946 – National Science Foundation

Advancing Infrastructure and Institutional Resilience to Climate Change for Coupled Water-Energy Systems

Selected Grants and Awards
(continued)

HALLIE EAKIN
$1,443,531 – National Science Foundation

CNH: The Dynamics of Multi-scalar Adaptation in the Megalopolis: Autonomous action, institutional change and social-hydrological risk in Mexico City (MEGADAPT)

MONICA ELSER
$10,000 – ASU's Citizen Science and Engagement Seed Grant

Citizen Science to Forecast the Future of a Desert City

ZACHARY HOLMAN
$2,800,000 – ARPA-e

A Solar Concentrator Mirror Incorporating PV Cells

KIRIL HRISTOVSKI, ASU PI
$4,099,973 – U.S. Environmental Protection Agency

Design of Risk Reducing, Innovative Implementable Small System Knowledge (DeRISK) Center

STEPHEN GOODNICK
$3,900,000 – ARPA-e

High-Temperature InGaN Thermionic Topping Cells

ALEX MAHALOV
$1,161,522 – National Science Foundation

EASM-3: Physics-Based Predictive Modeling for Integrated Agricultural and Urban Applications

BEN MINTEER
$236,199 – National Science Foundation

Past, Present and Future of Conservation in Zoological Institutions

CHARLES PERRINGS
$1,450,000 – National Science Foundation

Risks of Animal and Plant Infectious Diseases through Trade (RAPID Trade)

Selected Publications

Asefi-Najafabady, S., with **K. R. Gurney** and others. A multiyear, global gridded fossil fuel CO_2 emission data product: Evaluation and analysis of results. *Journal of Geophysical Research* 119(10):213-231.

Anadóna, J. D., **O. E. Sala, B. L. Turner II** and E. M. Bennett. Effect of woody-plant encroachment on livestock production in North and South America. *Proceedings of the National Academy of Sciences* 111(35):12948-12953.

PLANT INVASION CAUSES DECREASED MEAT PRODUCTION
Distinguished Sustainability Scientists **Osvaldo Sala** and **B. L. Turner II** published a study that showed the steady encroachment of woody plants like shrubs and trees leads to diminished rangeland. Because woody plant cover in North America increases at a rate of up to 2 percent every year, rangelands are likely to experience a continued decrease in meat production.

Anderies, J. M. Understanding the dynamics of sustainable social-ecological systems: Human behavior, institutions, and regulatory feedback networks. *Bulletin of Mathematical Biology* 77(2):259-280.

Barnett, A. J. and **J. M. Anderies**. Weak feedbacks, governance mismatches, and the robustness of social-ecological systems: An analysis of the southwest Nova Scotia lobster fishery with comparison to Maine. *Ecology and Society* 19(4):Art. 39.

Barrett, S., with **J. M. Anderies** and others. Climate engineering reconsidered. *Nature Climate Change* 4:527-529.

Bartos, M. and **M. V. Chester**. The conservation nexus: Valuing the interdependent water and energy savings in Arizona. *Environmental Science and Technology* 48(4):2139-2149.

Bernstein, M. J., **A. Wiek**, K. Brundiers, K. Pearson, A. Minowitz, B. Kay and **A. Golub**. Mitigating urban sprawl effects: A collaborative tree and shade intervention in Phoenix, Arizona, USA. *Local Environment: The International Journal of Justice and Sustainability.*

Boone, C. G. Introduction to special section on urbanization, carbon cycle, and climate change. *Earth's Future* 2(10):471-472.

Boone, C. G., **C. L. Redman** and others. Reconceptualzing land for sustainable urbanity. Pp. 313-330 In: Seto, K. C. and A. Reenberg eds., *Rethinking Global Land Use in an Urban Era*. Vol 14. MIT Press.

Boone, C. G., M. Fragkias, G. L. Buckley and J. M. Grove. A long view of polluting industry and environmental justice in Baltimore. *Cities* 36:41-49.

Bozlaker, A., with **M. P. Fraser** and others. Elemental characterization of $PM_{2.5}$ and PM_{10} emitted from light duty vehicles in the Washburn Tunnel of Houston, Texas: Release of rhodium, palladium, and platinum. *Environmental Science & Technology* 48(1):54-62.

Challinor, A. J., with **N. Chhetri** and others. A meta-analysis of crop yield under climate change and adaptation. *Nature Climate Change* 4(2014):287-291.

Childers, D. L., S. T. Pickett, J. M. Grove, L. A. Ogden and A. C. Whitmer. Advancing urban sustainability theory and action: Challenges and opportunities. *Landscape and Urban Planning* 125(2014):320-328.

Choi, J.-Y. and **C. B. Honsberg**. Silicon nano-fabrication by using silica nanosphere lithography technique for enhanced light management. *Proceedings of the 40th IEEE Photovoltaic Specialist Conference* 2014:2206-2208.

Chow, W. T., T. J. Volo, **E. R. Vivoni**, G. D. Jenerette and **B. L. Ruddell**. Seasonal dynamics of a suburban energy balance in Phoenix, Arizona. *International Journal of Climatology* 34(15):3863-3880.

Clements, A. L., with **M. P. Fraser**, **P. Herckes**, and others. Chemical characterization of coarse particulate matter in the desert Southwest – Pinal County, Arizona, USA. *Atmospheric Pollution Research* 5(1):52-61.

Collins, S. L. and **D. L. Childers**. Long-term ecological research and network-level science. *EOS Transactions* 95(33):293-304.

Selected Publications *(continued)*

Collins, S. L., with **N. B. Grimm** and others. A multiscale, hierarchical model of pulse dynamics in arid-land ecosystems. *Annual Review of Ecology, Evolution and Systematics* 45:397-419.

Darnall, N. and J. A. Aragon-Correa. Can ecolabels influence firms' sustainability strategy and stakeholder behavior? *Organization & Environment* 27(4):319-327.

Dodds, W. K., with **N. B. Grimm** and others. The Lotic Intersite Nitrogen Experiments: An example of successful ecological research collaboration. *Freshwater Science* 33(3):700-710.

Eakin, H. and others. Significance of telecoupling for exploration of (sustainable) land use change. Pp. 141-162 In: Seto, K. C. and A. Reenberg eds., *Rethinking Global Land Use in an Urban Era.* MIT Press.

Eakin, H., M. C. Lemos and D. R. Nelson. Differentiating capacities as a means to sustainable climate change adaptation. *Global Environmental Change* 27:1-8.

Fan, C., B. Zheng, **S. W. Myint** and **R. M. Aggarwal**. Characterizing changes in cropping patterns using sequential Landsat imagery: An adaptive threshold approach and application to Phoenix, Arizona. *International Journal of Remote Sensing* 35(20):7263-7278.

Fenichel, E. P. and **J. K. Abbott**. Heterogeneity and the fragility of the first best: Putting the "micro" in bioeconomic models of recreational resources. *Resource and Energy Economics* 36(2):351-369.

Fenichel, E. P. and **J. K. Abbott**. Natural capital: From metaphor to measurement. *Journal of the Association of Environmental and Resource Economists* 1(1):1-27.

EQUATION ASSIGNS DOLLAR VALUE TO NATURAL RESOURCES

School of Sustainability associate professor **Joshua Abbott** and his Yale University colleague have developed an interdisciplinary equation that assigns a dollar value to natural resources. By putting natural resources on par with other forms of wealth, the equation will have widespread implications for policymakers and other stakeholders.

Foley, R. W. and **A. Wiek**. Scenarios of nanotechnology innovation vis-à-vis sustainability challenges. *Futures* 64:1-14.

Forrest, N. and **A. Wiek**. Learning from success – toward evidence-informed sustainability transitions in communities. *Environmental Innovation and Societal Transitions* 12:68-88.

Freeman, J., **J. M. Anderies**, A. Torvinen and **B. A. Nelson**. Crop specialization, exchange and robustness in a semi-arid environment. *Human Ecology* 42(2):297-310.

Gao, L., M. Zheng, **M. P. Fraser** and Y. Huang. Comparable hydrogen isotopic fractionation of plant leaf wax n-alkanoic acids in arid and humid subtropical ecosystems. *Geochemistry, Geophysics, Geosystems* 15(2):361-373.

Gober, P., D. D. White, R. Quay, D. A. Sampson and C. W. Kirkwood. Socio-hydrology modelling for an uncertain future, with examples from the USA and Canada. In: Riddick, A. T., H. Kessler and J. R. Giles eds., *Integrated Environmental Modelling to Solve Real World Problems: Methods, Vision and Challenges*. Vol 408. The Geological Society of London.

Golub, A. and K. Martens. Using principles of justice to assess the modal equity of regional transportation plans. *Journal of Transport Geography* 41:10-20.

Graffy, E. and S. Kihm. Does disruptive competition mean a death spiral for electric utilities? *Energy Law Journal* 35(1):1-44.

Groffman, P. M., with **S. J. Hall**, **K. L. Larson** and others. Ecological homogenization of urban America. *Frontiers in Ecology and the Environment* 12(1):74-81.

Hale, R. L., L. Turnbull, S. Earl, **N. B. Grimm**, K. Riha, G. Michalski, K. A. Lohse and **D. L. Childers**. Sources and transport of nitrogen in arid urban watersheds. *Environmental Science & Technology* 48(11):6211–6219.

Harlan, S. L., with **B. L. Ruddell** and others. Heat-related deaths in hot cities: Estimates of human tolerance to high temperature thresholds. *International Journal of Environmental Research and Public Health* 11(3):3304-3326.

Hondula, D. M., M. Georgescu and **R. C. Balling**. Challenges associated with projecting urbanization-induced heat-related mortality. *Science of the Total Environment* 490(2014):538-544.

HOTTER NIGHTS INCREASE HEAT-RELATED DEATHS

A study co-authored by sustainability scientists **David Hondula**, **Matei Georgescu** and **Robert Balling** indicates that increasing overnight temperatures pose a greater threat to human health in Maricopa County than daytime temperatures. More sustainable urban development strategies may decrease the number of heat-related illnesses and deaths.

Hruschka, D. J., C. Hadley and **A. A. Brewis**. Disentangling basal and accumulated body mass for cross-population comparisons. *American Journal of Physical Anthropology* 153(4):542-550.

Hutyra, L. R, with **K. R. Gurney**, **N. B. Grimm** and others. Urbanization and the carbon cycle: Current capabilities and research outlook from the natural sciences perspective. *Earth's Future* 2(10):473-495.

Iwaniec, D. and **A. Wiek**. Advancing sustainability visioning practice in planning – The General Plan update in Phoenix, Arizona. *Planning Practice and Research* 29(5):543-568.

Iwaniec, D. M., **D. L. Childers**, K. Vanlehn and **A. Wiek**. Studying, teaching and applying sustainability visions using systems modeling. *Sustainability* 6:4452-4469.

Janssen, M. A., A. Lee and T. M. Waring. Experimental platforms for behavioral experiments on social-ecological systems. *Ecology and Society* 19(4):Art. 20.

Kane, K., **A. M. York**, J. Tuccillo, L. Gentile and Y. Ouyang. Residential development during the Great Recession: A shifting focus in Phoenix, Arizona. *Urban Geography* 35(4):486-507.

Kane, K., J. Tuccillo, **A. M. York**, L. Gentile and Y. Ouyang. A spatio-temporal view of historical growth in downtown Phoenix, Arizona, USA. *Landscape and Urban Planning* 121(2014):70-80.

Selected Publications *(continued)*

Kaplan, S., **S. W. Myint**, C. Fan and **A. J. Brazel**. Quantifying outdoor water consumption of urban land use/land cover: Sensitivity to drought. *Environmental Management* 53(4):855-864.

Kim, Y., with **C. B. Honsberg** and others. Structural and optical properties of multi-stack InAs/GaAsSb quantum dots with different Sb composition. *Proceedings of the 40th IEEE Photovoltaic Specialist Conference* 2014:1056-1058.

Klinsky, S. Towards constructive fairness: Applying the social-psychology of fairness to climate policy. Pp. 10-15 In: de Coninck, H., R. Lorch and A. Sagar eds., *The Way Forward in International Climate Policy: Key Issues and New Ideas.* Climate and Development Knowledge Network.

Klinsky, S. and H. Winkler. Equity, sustainable development and climate policy. *Climate Policy* 14(1):107.

Koch, G. R., S. Hagerthey, **D. L. Childers** and E. Gaiser. Examining seasonally pulsed detrital transport in the coastal Everglades using a sediment tracing technique. *Wetlands* 54(1 Supple.):123-133.

Kupitz, C., with **P. Fromme**, **A. Moore**, **T. Moore** and others. Serial time-resolved crystallography of photosystem II using a femtosecond X-ray laser. *Nature* 513:261-265.

A CRUCIAL STEP TOWARD ARTIFICIAL PHOTOSYNTHESIS

ASU sustainability scientists **Petra Fromme**, **Tom Moore** and **Ana Moore** are among the authors of a study that used the world's most powerful X-ray to obtain images of water splitting into protons, electrons and oxygen. By revealing the mechanism of the water-splitting process, researchers are one step closer to creating an artificial leaf.

Kuzdas, C. and **A. Wiek**. Governance scenarios for addressing water conflicts and climate change impacts. *Environmental Science & Policy* (42):181-196.

Larson, K. L. and E. N. Redman. Water education for sustainability: A critique and recommendations. *Society and Natural Resources* 27(11).

Larson, K. L. and J. Brumand. Paradoxes in landscape management and water conservation: Examining neighborhood norms and institutional forces. *Cities and the Environment* 7(1):Art. 6.

Lee, J. and **C. B. Honsberg**. Limiting efficiencies of integrating single junction with intermediate band solar cells for multiphysics effects. *Proceedings of the 40th IEEE Photovoltaic Specialist Conference* 2014:1068-1072.

Lewis, D. B., J. P. Kaye and **A. P. Kinzig**. Legacies of agriculture and urbanization in labile and stable organic carbon and nitrogen in Sonoran Desert soils. *Ecosphere* 5(5):Art. 59.

Li, X., **S. W. Myint**, Y. Zhang, C. S. Galletti and **B. L. Turner II**. Object-based land-cover classification for metropolitan Phoenix, Arizona, using aerial photography. *International Journal of Applied Earth Observation and Geoinformation* 33:321-330.

Lin, T. and **N. B. Grimm**. Comparative study of urban ecology development in the U.S. and China: Opportunity and challenge. *Urban Ecosystems.*

Mahalov, A. and **M. Moustaoui**. Multiscale nested simulations of Rayleigh-Taylor instabilities in ionospheric flows. *Journal of Fluids Engineering* 136:060908-1-060908-8.

Manuel-Navarrete, D. Human environmental integration and social power in global environmental change research. Chapter 27 In: Sygna, L., K. O'Brien and J. Wolf eds., *A Changing Environment for Human Security: Transformative Approaches to Research, Policy, and Action.* Routledge.

McNall, S. G. and **G. Basile**. How to create a new narrative for sustainability that will work: And why it matters, part 2. *Sustainability: The Journal of Record* 7(1):9-20.

Miller, C. A. The ethics of energy transitions. *Proceedings of the IEEE Symposium on Ethics in Engineering, Science, and Technology* 2014:1-5.

Miller, C. A. and J. Richter. Social planning for energy transitions. *Current Sustainable/Renewable Energy Reports* 1(3):77-84.

Miller, T. R., **A. Wiek**, **D. Sarewitz**, L. Olsson, D. Kriebel and D. Loorbach. The future of sustainability science: A solutions-oriented agenda. *Sustainability Science* 9(2):239-246.

Norström, A., with **M. Milkoreit**, **M. L. Schoon** and others. Three necessary conditions for establishing effective sustainable development goals in the Anthropocene. *Ecology and Society* 19(3):8.

Oh, J., **S. Bowden** and G. Tamizhani. Application of reverse bias recovery technique to address PID issue: Incompleteness of shunt resistance and quantum efficiency recovery. *Proceedings of the 40th IEEE Photovoltaic Specialists Conference* 2014:0925-0929.

Ouyang, Y., **E. A. Wentz**, **B. L. Ruddell** and **S. L. Harlan**. A multi-scale analysis of the single-family residential water use in the Phoenix metropolitan area. *Journal of the American Water Resources Association* 50(2):448-467.

Oye, K. A., with **J. P. Collins** and others. Regulating gene drives. *Science* 345(6197):626-628.

Polsky, C., with **S. J. Hall**, **K. L. Larson** and others. Assessing the homogenization of urban land management with an application to US residential lawn care. *Proceedings of the National Academy of Sciences of the United States of America* 111(12):4432-4437.

Pyke, B. F. G., with **R. U. Halden** and others. Human fetal exposure to triclosan and triclocarban in an urban population from Brooklyn, New York. *Environmental Science and Technology* 48(15):8831-8838.

ANTIBACTERIAL PRODUCTS FOUND IN EXPECTING MOTHERS

A research team led by **Rolf Halden**, director of ASU's Center for Environmental Security, has found antibacterial compounds like triclosan and triclocarban in the urine and umbilical cords of pregnant women. These compounds may contribute to growing antibiotic resistance and may be linked to developmental and reproductive difficulties.

Selected Publications *(continued)*

Qubbaj, M. R., **S. T. Shutters** and **R. Muneepeerakul**. Living in a network of scaling cities and finite resources. *Bulletin of Mathematical Biology* 77(2):390-407.

Ravikumar, D., **T. P. Seager, M. V. Chester** and **M. P. Fraser**. Intertemporal cumulative radiative forcing effects of photovoltaic deployments. *Environmental Science and Technology* 48:10010-10018.

Redman, C. L. Should sustainability and resilience be combined or remain distinct pursuits? *Ecology and Society* 19(2):37.

Reimer, M. N., **J. K. Abbott** and J. E. Wilen. Unraveling the multiple margins of rent generation from individual transferable quotas. *Land Economics* 90(3):538-559.

Romero-Lankao, P., with **K. R. Gurney, M. V. Chester, N. B. Grimm** and others. A critical knowledge pathway to low-carbon, sustainable futures: Integrated understanding of urbanization, urban areas and carbon. *Earth's Future* 2(10):515-532.

Seo, K., **A. Golub** and **M. Kuby**. Combined impacts of highways and light rail transit on residential property values: A spatial hedonic price model for Phoenix, Arizona. *Journal of Transport Geography* 41:53-62.

Steele, M. K., with **S. J. Hall**, **K. L. Larson** and others. Convergent surface water distributions in U.S. cities. *Ecosystems* 17:685-697.

Tang, X., with **P. Ohri-Vachaspati, J. K. Abbott, R. M. Aggarwal** and others. Associations between food environment around schools and professionally measured weight status for middle and high school students. *Childhood Obesity* 10(6):511-517.

Toké, N. A., **C. G. Boone** and J. R. Arrowsmith. Fault zone regulation, seismic hazard, and social vulnerability in Los Angeles, California: Hazard or urban amenity? *Earth's Future* 2(9):440-457.

DANGEROUS FAULT ZONES ARE PLAYGROUNDS FOR THE WEALTHY
A study authored by former ASU Urban Ecology IGERT Fellow Nate Toké and two ASU faculty members shows that wealthy individuals in the Los Angeles area are choosing to live near earthquake fault zones, where prohibitions against development have created parks and green spaces. Typically, it is poor and minority communities who live near environmental hazards. The study demonstrates that social vulnerability may be more closely linked to a lack of amenities than to environmental hazards.

Vins, H., **A. Wutich**, **A. A. Brewis**, M. Beresford, A. Ruth and C. Roberts. Children's perceived water futures in the United States Southwest. *Human Organization* 73(3):235-246.

Volo, T. J., **E. R. Vivoni**, **C. A. Martin**, S. Earl and **B. L. Ruddell**. Modelling soil moisture, water partitioning, and plant water stress under irrigated conditions in desert urban areas. *Ecohydrology* 7:1297-1313.

Warner, B. P. and **M. Elser**. How do sustainable schools integrate sustainability education? An assessment of certified sustainable K–12 schools in the United States. *The Journal of Environmental Education* 46(1):1-22.

Wender, B. A., with **T. P. Seager**, **M. P. Fraser**, **D. H. Guston** and others. Illustrating anticipatory life cycle assessment for emerging photovoltaic technologies. *Environmental Science & Technology* 48(18):10531-10538.

Wentz, E. A., A. J. Wills, W. K. Kim, **S. W. Myint**, **P. Gober** and **R. C. Balling**. Factors influencing water consumption in multifamily housing in Tempe, Arizona. *The Professional Geographer* 66(3):501-510.

Wiek, A. and D. Iwaniec. Quality criteria for visions and visioning in sustainability science. *Sustainability Science* 9(4):497-512.

Wiek, A. and O. Weber. Sustainability challenges and the ambivalent role of the financial sector. *Journal of Sustainable Finance & Investment* 4(1):9-20.

Wiek, A., A. Xiong, K. Brundiers and **S. E. van der Leeuw**. Integrating problem- and project-based learning into sustainability programs: A case study on the School of Sustainability at Arizona State University. *International Journal of Sustainability in Higher Education* 15(4):431-449.

Wiek, A., B. Ness, P. Schweizer-Ries and F. Farioli. Collaboration for transformation. *Sustainability Science* 9(1):113-114.

Wiek, A., **D. Petrucci** and R. W. Foley. Imaging the future city. *Issues in Science and Technology* 31(1).

Wiek, A., S. Talwar, M. O'Shea and J. Robinson. Toward a methodological scheme for capturing societal effects of participatory sustainability research. *Research Evaluation* 23(2):117-132.

Williams, J., with **C. B. Honsberg** and others. Growth of high crystal quality InN by ENABLE-MBE. *Current Topics in Solid State Physics* 11(3-4):577-580.

Wise, R. M., with **H. Eakin** and others. Reconceptualizing adaptation to climate change as part of pathways of change and response. *Global Environmental Change* 28:325-336.

Wutich, A. and **A. A. Brewis**. Food, water, and scarcity: Toward a broader anthropology of resource insecurity. *Current Anthropology* 55(4):444–468.

Wutich, A., A. C. White, **D. D. White**, **K. L. Larson**, **A. A. Brewis** and C. Roberts. Hard paths, soft paths, or no paths? Cross-cultural perceptions of water solutions. *Hydrology and Earth System Sciences* 18(1):109–120.

Wutich, A., A. Ruth, **A. A. Brewis** and **C. G. Boone**. Stigmatized neighborhoods, social bonds, and health. *Medical Anthropology Quarterly* 28(4):556-577.

York, A., J. Tuccillo, **B. Bolin**, **C. G. Boone**, L. E. Gentile, B. Schoon and K. Kane. Zoning and land use: A tale of incompatibility and environmental injustice in early Phoenix. *Journal of Urban Affairs* 36(5):833-853.

Zhang, Z., with **J. J. Elser**, **A. J. Cease** and others. Grasshoppers regulate N:P stoichiometric homeostasis by changing phosphorus contents in their frass. *PLOS One* 9(8):e103697.

Alumni Class Notes

ASU School of Sustainability

Laura Avant — BA 2009
began working as a market research analyst for NRG Energy in Houston, Tex.

Eric Beeler — BS 2012
accepted a position as sustainability program coordinator at the University of Oregon.

Manjyot Bhan — MS 2010
was an environmental policy intern for the United Nations Environmental Programme's North America office, based in Washington, D.C.

Christa Brelsford — PhD 2014
published an article in *Scientific Reports* on her work analyzing Twitter users around the 2011 earthquake and tsunami in Japan. The article's authors describe a new way to use social media communities to study social change.

Jaleila Brumand — BS 2013

completed her Fulbright work in environmental science at Lancaster University, U.K.

Mariela Castaneda — BA 2013
was hired as a water educator for Project WET Foundation in Tucson, Ariz.

Cameron Childs — MA 2012
was hired as a product manager for Sustainable Apparel Coalition in San Francisco, Calif.

Brittany DeKnight — MA 2009
marked her fifth year as associate director of the Shi Center for Sustainability at Furman University, S.C.

Natalie Fleming — BA 2012

is partnerships lead for Hampton Creek, a food company based in the San Francisco Bay area.

Emily Freeman — MS 2011
was hired as program administrator for the City and County of Denver's Environmental Management System.

Brittni Furrow — MS 2010
was promoted to senior director of sustainability for Walmart Stores, Inc., leading the company's global sustainable food platform.

Karen Kao — MSUS 2013

works as a change management program coordinator for Boston-based GreenerU, helping colleges and universities to accelerate sustainability.

Lauren Withycombe Keeler — MA 2010
accepted a postdoctoral scholar position at Leuphana Universität Lüneburg, Germany.

Andrew Krause — BS 2009, MS 2012

was a 2014 delegate to the UN Global Accelerator. Krause is co-founder of eEcosphere, a sustainability app that was featured in HuffPo in July 2014.

Hannah La Luzerne — BS 2013

accepted a position as sustainability manager for Wholesum Harvest in Nogales, Ariz.

Genevieve Metson — MS 2011
successfully defended her PhD at McGill University, Canada. She accepted a postdoctoral position at the U.S. Environmental Protection Agency in Portland, Ore.

Did you know? Members of the ASU Alumni Association can get an ASU library card for just $25.
alumni.asu.edu/join

Stacy Meyer — BA 2011
accepted a position with San Diego-based Classy.org, a fundraising platform for social good organizations.

Kimberly Pearson — BS 2012
accepted a position as senior resource specialist for the City of Boulder, Colo.

Chad Sharrard — BA 2014
has accepted a Peace Corps post in Micronesia.

Thomas "T.C." Redd — MS 2012
was promoted to senior manager, responsible for advancing Walmart's Sustainability Index.

Kathleen Talbot — MA 2012
was hired as senior sustainability and business operations manager for Reformation, a clothing company based in Los Angeles.

Colin Tetreault — MA 2010

and wife Jenny welcomed son Connor Tennyson Tetreault in February 2014. Colin served for two years as senior policy advisor for sustainability to City of Phoenix Mayor Greg Stanton and is now a manager and faculty associate for the School of Sustainability.

Chelsi Tryon — BA 2012, MSUS 2014 manages resort-wide sustainability efforts as sustainability coordinator for Sea Island, a five-star luxury resort located in Georgia.

Get connected!

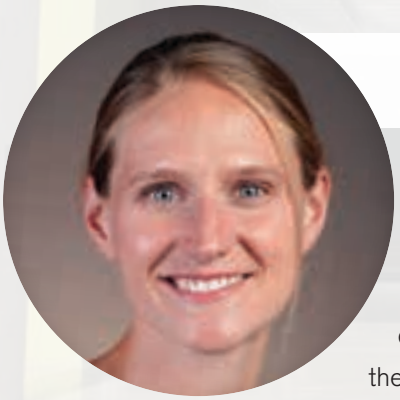
ASU Alumni Association has geographic chapters all over the U.S., plus connections around the world. Find Sun Devils near you.
alumni.asu.edu/groups

Please share your accomplishments with us.

Email them to **sosalumni@asu.edu** or mail them to Stephanie Quintero, your alumni relations coordinator.

School of Sustainability
Arizona State University
PO Box 875502
Tempe, AZ 85287-5502

Welcome
new faculty members



Hanna Breetz
Assistant Professor

Dr. Breetz is a political scientist who studies the political economy of alternative energy, focusing on biofuels and synthetic fuels. Her research investigates both the drivers of alternative energy policy – including the role of interest groups, decision-making institutions, and information about science and technology – as well as the impact of energy policy on innovation and technological change. She has a PhD in political science from MIT and a BA in government and environmental science from Dartmouth College.

Arianne Cease
Assistant Professor

Dr. Cease is a sustainability scientist with a focus on the ecology and physiology of organisms in coupled natural and human systems. Her research involves interdisciplinary approaches to understanding how human-plant-insect interactions affect the sustainability of agricultural systems. A key goal of her research is to improve sustainable ecosystem management and local livelihoods by linking fundamental research on animal physiology and ecology with economic models and policy. She has a PhD in biology from ASU and a BS in zoology from Oregon State University.

2013-14 Scholarship Recipients

Martinson Sustainability Solutions Research Grant

Designed to support and advance sustainability research and applied projects from local to global in scope.

Angela Cazel-Jahn, *MSUS Student*
Adapt & Sustain: A Mural of a Dialogue

Neely Foundation Food and Agriculture Sustainability Research Grant

Designed to support and advance research and applied projects related to food and agricultural system sustainability.

Ashwina Mahanti, *PhD Student*
Governance for food system sustainability in a globalized epoch: A case study of palm oil certification in Colombia

Jared Stoltzfus, *PhD Student*
Organic waste management as a mechanism for phosphorous cycling: Case studies from India

David Yu, *PhD Student*
Robustness of irrigation systems to environmental variability: Evidence from behavioral laboratory experiments

Ray Anderson Memorial Scholarship

Ray Anderson was a member of the Board of Directors for Sustainability at ASU for five years. In that role, he played a vital part in the creation of the institute and the school. This scholarship is intended to be a lasting legacy of Ray Anderson's vision and leadership.

Sara-Laura de la Torre Dolins, *MSUS Student*

Norton and Ramsey Sustainability Scholarship

The first endowed scholarship for undergraduate students pursuing studies about how populations facing poverty and social justice issues may be more likely to benefit from sustainability practices and/or may have ideas worthy of documenting and sharing to help society at large.

Akane Ota, *BS Student*

CannonDesign Excellence in Sustainability Scholarship

Thanks to a generous donation from CannonDesign, this will be a new scholarship opportunity for students in 2014-15.

Thank you
Julie Ann Wrigley

ASU JULIE ANN WRIGLEY
GLOBAL INSTITUTE *of* SUSTAINABILITY
ARIZONA STATE UNIVERSITY

sustainability.asu.edu

ASU SCHOOL of SUSTAINABILITY
ARIZONA STATE UNIVERSITY

School of Sustainability
PO Box 875502
Tempe, AZ 85287-5502

ZERO WASTE AT ASU

Arizona State University is committed to achieving zero solid waste across all campus locations. ASU defines zero solid waste as a 90-percent reduction in the waste it sends to landfills. The university plans to decrease its landfill waste through reduced consumption, recycling, composting and reusing or repurposing.

RECYCLE

ASU's commingled recycling program accepts a wide array of materials, including paper, plastic, metals and glass.

COMPOST

ASU is introducing green bin composting in phases. All food, including meat and dairy, as well as paper cups and napkins can be composted.

REUSE

ASU gives useful items to new owners, returns them to their manufacturers or develops new ways to use them.

The School of Sustainability is a unit of:

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ENVIRONMENTAL SAVINGS

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trees	water	energy	solid waste	greenhouse gases
2 fully grown	**8,261** gallons	**15,000,000** BTUs	**1019** pounds	**2,597** pounds

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