As evidence of human impact on the environment mounts, the global conversation about sustaining a greener and healthier planet has taken on a renewed sense of urgency. At UD, though, “green” is more than a slogan, and we have done more than just talk about sustainability. Our commitment to environmental and alternative energy research stretches back decades. More recently, we have been working steadily to build our Newark and Lewes campuses into powerful hubs of research, teaching, technological innovation and policy development focused on one goal: helping a planet with finite resources find better and cleaner ways to serve people’s needs. This means everything from reducing pollution in the Chesapeake Bay, to unraveling the science of converting biomass into fuels, to creating synthetic “eco-leather” made from natural fibers and vegetable oil resins instead of tanned cowhide. These projects and others like them awaken our students and faculty early in the morning and keep them working late into the night.

Throughout UD, we are well on our way to achieving the goal we set in the Path to Prominence™: to be a national and international resource for others who want to be part of the solution for a sustainable planet. We have attracted and supported some of the best faculty and students while creating new research centers that are solving real-world energy and environmental problems. We have forged partnerships with government, industry and other universities to share our expertise and bolster our own capabilities.

There is yet another essential partner, however: you, our alumni and friends, who care not only about UD, but also about the world we all inhabit and will leave to our children. Whether you choose to support a faculty member or student, a project or program, or a new space or facility, you can make a critical difference in moving this work forward... on campus, throughout the region and beyond.
Greening > OUR CAMPUS

UD’s commitment to sustainability begins at home. In spring 2009, we set forth an aggressive Climate Action Plan that aims to cut campus-wide emissions by 20 percent by the year 2020. At the same time, we are building UD into a center for pioneering research and education focused on environmental issues. This is just a sampling of projects currently in action.

To read more about UD’s efforts, visit www.udel.edu/sustainability.

ENVIRONMENTAL HUMANITIES INITIATIVE

This new initiative is joining faculty from the arts and humanities, science and public policy to promote conversation about environmental issues on UD’s campus, bring in leading authors and experts for events, and build new research collaborations. The group is also working to create a new environmental humanities minor.

UD SUSTAINABILITY FUND

The UD Sustainability Fund is an offshoot of the work of the UD Sustainability Task Force, which wanted to jumpstart projects aimed at reducing UD’s carbon footprint. Since 2009, thanks to donations from faculty, students, alumni and corporations, the Fund has dispersed nearly $40,000 in grants for projects like the Colburn Green Roof and wetland development in the Cool Run Watershed. As part of a new partnership with UD, Pepsi will funnel $100,000 into watershed as part of a new partnership with UD, Pepsi will funnel $100,000 into watershed as part of a new partnership

FUEL CELL BUSES

Main Street and Campus-wide

This fall, the UD Center for Fuel Cell Research will unveil a third fuel cell campus shuttle bus, with four to be added in 2013—a significant accomplishment, given that there are only about 15 fuel cell buses in the entire nation. The fleet runs on electric power generated by combining hydrogen and oxygen in a fuel cell and the only exhaust is water vapor. With each new bus, UD researchers are able to improve power and efficiency and move the technology closer to large-scale commercialization.

BLOOM ENERGY

Bloom Energy recently broke ground on UD’s Science, Technology and Advanced Research Campus (the former Chrysler site) to build its first East Coast manufacturing center. Bloom’s Energy Server™ is essentially a power box that uses solid oxide fuel cell technology—not fuel combustion—to produce clean, reliable, affordable electricity on site at homes or businesses. Fortune 500 companies such as Google, eBay, Staples and Coca-Cola are already using the “Bloom Boxes” to generate power.

GREEN ROOF

Colburn Laboratory

UD students and staff recently finished installing a 2,200-square-foot green roof on Colburn Laboratory, a project that took root when chemical engineering professor Annette Shine and her students found themselves sweltering in the Lab’s annex classrooms. The roof lowers the peak temperature in the rooms below by several degrees, reducing energy consumption for air conditioning. During summer 2012 alone, the roof not only saved 1,150 kWh of energy, or about 1,470 pounds of CO2 emissions, but also diverted nearly 13,000 gallons of stormwater from running into nearby streams.

UD GARDEN FOR THE COMMUNITY

College of Agriculture and Natural Resources

What began as a garden for graduate students’ personal use has evolved into the UD Garden for the Community, a project that brings together students, staff and neighbors to raise fresh produce for needy Delawareans. In the past year alone, UD donated more than 8,800 pounds of vegetables and herbs to the Food Bank of Delaware. A great side benefit: hands-on experience for students interested in sustainable gardening and agricultural practices.

ISE LAB

Academy Street and Lovett Avenue

When it opens in 2013, the Interdisciplinary Science and Engineering Laboratory will not only house research teams dedicated to solving environmental and energy challenges, but also embody green building practices. The ISE Lab will feature three green roofs, thin-film solar panels, stormwater retention areas, and automatic sensors to power down equipment and lighting. Moving forward, all new UD buildings will be designed to meet the U.S. Green Building Council’s criteria for at least a LEED Silver rating (Leadership in Energy and Environmental Design).

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VEHICLE-TO-GRID CARS

Places Main and South Main

Together with NRG Energy, AutoPort and other industry partners, UD researchers in the Center for Carbon-Free Power Integration and the Departments of Computer Science and Electrical Engineering are conducting the first commercial-scale pilot of vehicle-to-grid or “V2G” cars. These specially-designed electric cars can actually send the power stored in their batteries back to the grid when they are plugged in—helping to supplement unreliable power sources such as wind and solar, stabilize the grid and provide ongoing revenue to electric car owners. A fleet of about 100 V2G cars is planned to test the technology.

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Sustaining Our Region

With the Delmarva Peninsula to the south, and Pennsylvania and New Jersey to the north and east, the University of Delaware is centered in a region with many of its own environmental challenges — from urban pollution and agricultural production to water quality and wildlife conservation. Our faculty and students use this setting as a living laboratory for understanding and addressing these challenges, which benefit us and our neighbors throughout this region.

Chesapeake Bay Conservation

Tracing Phosphorus Pollution

Excessive input of nutrients into the Chesapeake Bay has caused overgrowth of algae and formed an oxygen-depleted dead zone. One culprit is phosphorus, but no one has attempted to trace the sources of this pollutant — much to the surprise of Deb Jaisi, assistant professor of plant and soil sciences, who came to UD to do just that. Using a state-of-the-art isotope lab to analyze sediment core samples from the bay floor, Dr. Jaisi and his team will be able to tell where the phosphorus has come from over the last several decades. “To resolve this problem, we first have to know the relative roles of different sources, such as natural processes, wastewater, agriculture and so on,” he says.

UD’s WATER Team

Creating a Cleaner White Clay Creek

Each year, three to five undergraduates serve as interns for the UD WATER Project (Watershed Action Team for Ecological Restoration), a partnership between UD and the City of Newark focused on reducing stormwater runoff into White Clay Creek, which runs through campus. A recent team completed an analysis of pollutants in the Cool Run tributary and authored an action plan for creating more wetlands. This is now the blueprint for UD WATER’s work moving forward.

Lewes Wind Turbine

Generating Power and New Research

Since 2010, UD’s Hugh Sharp Campus has been fully powered by the wind turbine at Lewes. In fact, the University has not needed all of the energy generated, selling 2.3 million kilowatt hours to the Lewes Board of Public Works. But the wind turbine is much more than a clean power source: it’s a piece for UD and Gamesa Technology researchers to test new component parts, find solutions to issues such as marine corrosion and vibration, and understand the impact on bird and bat populations.

UD’s Industrial Assessment Center

Making Manufacturing More Energy Efficient

Engineering professor Keith Goossen had just started performing energy audits in 2007 when he was named director of the new UD Industrial Assessment Center (UD-IAC), one of 24 Department of Energy (DOE)-funded centers in the nation. Now the UD-IAC has been named the DOE’s 2012 Center of Excellence. Working with teams of students, Professor Goossen visits small to mid-sized manufacturing companies within 150 miles of UD to audit energy use and make efficiency recommendations. “We have completed 100 assessments and 45 percent of our recommendations have been implemented,” Goossen says. The Department of Energy recognized the UD-IAC for saving businesses more than $6 million a year.

A Data-Gathering Airship

Gaining a Bird’s Eye View

You can’t always see human impact on the environment just by standing on the ground. Thanks to a gift from Rachel Jewett Ledbetter ’44, UD researchers and students now have a lightweight airship to gather their own data and imagery from an aerial vantage point. Recent uses have included thermal imaging of water along the coastline, detecting gases emitted by landfills and mapping sediment buildup in estuaries — all essential data for improving the region’s environmental health.

Seashore Mallow Project

Protecting Low-Lying Farmlands

“In my lifetime, the sea level in Lewes has risen 9 inches,” notes Jack Gallagher, marine sciences professor. “Farmlands close to estuaries are increasingly being flooded with salt water.” This is why Dr. Gallagher and his research team are so excited by the crop potential of seashore mallow, a salt-tolerant perennial. They are studying it as a source of biodiesel, food and absorptive fiber products, and as a storehouse of carbon and nutrients in buffers bordering low-lying farmlands. Although the work has received federal funding, private donors like Pat ’72 and Charlie Robertson have played a lead role in propelling it forward.

To learn more about any of these projects, email us at insidedelaware@udel.edu.
Researchers from the University of Delaware are working on projects all around the globe to improve the health of our planet and gain a broader perspective on environmental issues. These UD ambassadors, like the ones profiled here, forge connections that increase our prominence internationally while also making a tangible difference in our world. Their work is a central part of our vision for becoming a university with global impact.

**RICHARD WOOL**

**Affordable Homes from Natural Composites**

Professor Wool, an internationally recognized expert on green chemistry, is designing and building low-cost homes from bio-based, energy-efficient materials as part of the UD ACRES Project (Affordable Composites from Renewable Sources). These include “positive net energy” homes in South Africa, which generate more energy than they use and can send power to the grid, and hurricane-resistant homes in Haiti with single-unit roofs.

**MATT OLIVER**

**Penguin Migration Near Antarctica**

A winner of the prestigious Presidential Early Career Award and an Alfred P. Sloan Research Fellowship in Oceanography, Professor Matt Oliver focuses his research on one central question: What controls distribution of marine species on the planet, whether they are bacteria or tiger sharks or penguins? In Antarctica, he is using autonomous underwater vehicles to track penguin foraging relative to ocean conditions — a project supported by NASA with additional assistance from Pat ’72 and Charles Robertson.

**JANINE SHERRIER**

**Beneficial Microbes and Legumes**

What if legumes such as beans and lentils — a major source of protein in the world’s food supply — could produce more of the beneficial bacteria that supports their growth, reducing dependence on chemical fertilizers for crop production? Janine Sherrier of the College of Agriculture and Natural Resources is part of a team awarded $6.8 million by the National Science Foundation to work on this question. Last year, she was joined in her lab by a researcher from Tunisia, who was seeking solutions to help legumes grow under conditions of drought and salt stress.

**CHRIS MEEHAN**

**Geothermal Energy Solutions in Finland**

Professor Chris Meehan, the Bentley Systems Incorporated Chair of Civil Engineering, will spend the next year as a Fulbright Scholar in Finland, where he will research techniques for more efficient development and deployment of geothermal heat pump systems. This renewable energy technology harnesses warmer ground temperatures in winter, and cooler ground temperatures in summer, to reduce the energy needed for heating and air conditioning in buildings.

**UD AND XIAMEN UNIVERSITY, CHINA**

**Joint Coastal Research and Management Institute**

Whether you live near the Atlantic Ocean or South China Sea, many of the environmental challenges to coastal areas are similar — and the U.S. and China can benefit from each other’s expertise. Since 2008, the Joint Coastal Research and Management Institute has enabled faculty members and students from the University of Delaware and Xiamen University to gather at both sites for conferences, seminars and research collaborations.

To learn about other UD research projects happening around the globe, check out the College of Earth, Ocean, and Environment’s worldwide research map at [www.ceoe.udel.edu/research](http://www.ceoe.udel.edu/research).
Q: How did you decide to attend the University of Delaware?
A: In the fall of 1941, when I was due to enter college, war raged in Europe. My mother had moved to Central America after my father’s death because her older brother was employed there. There was extreme concern about what might await the U.S. I had spent four years at a boarding school in New England, and with the world situation as it was, my mother felt that Delaware was a good choice. We had family and friends there who could “look after” me should the need arise.

Q: Have you remained connected to UD since graduating? What motivated you to want to make a significant gift to the University a few years ago?
A: After I married, I moved to Dallas, Texas, and did not have much cause to come back to UD. But I have stayed connected by reading as much as I can of what the University sends me. Over the years I have been impressed by the number of research projects going on in so many different areas. The scope is truly mind-boggling. The University has grown so much since I was there.

Q: What have you found most satisfying as you have watched the UD blimp move from idea to reality?
A: Coincidentally, the airship manufacturer was located outside Dallas. In 2008, I had the chance to go over and watch a test flight of the UD blimp with the professors who were going to use it. In 2009, I went to Delaware for the dedication. Both experiences were exciting. It is satisfying to know that the airship is now being used for environmental study and research. I am glad that I could supply the funds to support this need and play at least some small role in advancing knowledge.

Q: What advice would you offer others who are thinking about supporting a program or project at UD?
A: Stay informed about what is going on at the University. Be aware, keep learning, stay knowledgeable. Find something that interests you and do what you can to support it.

Visit www.udel.edu/giving to read past issues of Inside Delaware

Stay up to date on UD’s latest progress and plans at www.udel.edu/prominence

For more information about giving opportunities call 302.831.2104