Y es, environmental stewardship is alive at Columbia University. It has expanded beyond rhetoric and recycling to all kinds of imaginative and tangible ways of living sustainably as a member of the Columbia community.

We can say this with certainty because of the grassroots and often unheralded efforts happening in all corners of our campuses. “...Working together as a community, we are taking a fresh approach to thinking about and managing our own environmental impact,” says University President Lee C. Bollinger. The list that follows shows only a portion of what’s going on this very day—and reinforces that in large, small and even surprising ways, the greening of Columbia gains momentum.

**MAKING AND HELPING IT ALL HAPPEN.**

Created last fall, the Department of Environmental Stewardship has become the center for Columbia’s local efforts on behalf of the Earth. Director Nilda Mesa works with departments and student groups on each of the Columbia campuses as they brainstorm, plan, teach, build, and refurbish, encouraging and informing greater choices.

**TRANSFORMING SPACE.**

Student Health Services has gone paperless. Earth and Environmental Engineering’s renovations include recycled carpeting, recyclable desk chairs, and energy saving light sensors and blinds. At the Law School, a lobby upgrade reuses and refinishes various departments, the Fu Foundation School of Engineering and Applied Science and the Lamont-Doherty Earth Observatory—all to collect data in order to measure energy usage, then find ways to reduce greenhouse gas emissions.

**DRINKING LOCALLY ROASTED, ORGANIC, FAIR TRADE COFFEE.**

Served in all dining service areas and coffee bars throughout the Morningside campus, the custom blend is roasted in Ozone Park, Queens. Columbia is the only university in New York City that serves 100 percent fair trade, organic coffee.

**BUYING LOCAL PRODUCE.**

Emphasis at John Jay Dining Hall is on buying more and more locally grown produce—all year long and mostly from farms on Long Island. Table ready right now: local lettuce and herbs. Local potatoes and other root vegetables were in the dining hall all winter long.

**BISING WITH BIODIESEL.**

What if the oil that cooks Columbia’s french fries could power shuttle buses between the Morningside campus and DUNK? Some of the University’s best and most enthusiastic minds are working on just that, in a collaboration coordinated by the Environmental Stewardship department that includes student groups, various departments, the Fu Foundation School of Engineering and Applied Science and the Lamont-Doherty Earth Observatory—all to collect data in order to measure energy usage, then find ways to reduce greenhouse gas emissions.

**SETTING UP A BIKE-FRIENDLY CAMPUS.**

New bike racks are arriving within weeks that will bring the number of such bike parking spots to 300 on the Morningside campus, conveniently scattered in 21 spots around the campus.

**HANDWASHING SUSTAINABLY.**

By year’s end, environmental friendliness will extend to clean hands on the Morningside campus. All Morningside soap dispensers and their contents will start using recyclable cartridges of liquid gel soap that foams in hand, requiring less water to rinse. And because each dispenser gives 2500 “shots” of soap (versus about 500 for traditional liquid soap), that means less packaging material and carbon emission in transporting.

**REUSING THROUGH GIVE + GO GREEN.**

The Eco-Rep—an undergraduate student organization dedicated to sustainability awareness and activity among their fellow students—will collect “stuff” from Move-Out that might otherwise be thrown into the trash. This third annual collaborative effort with Housing & Dining, Great Forest, Salvation Army, City Harvest and Peer Scholars will take place on May 9-11, from noon to 4 p.m.—making it easy to donate to local charities.

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**REDUCING ELECTRICITY USAGE, TOGETHER.**

When electricity is scarce in New York State—as it is during a heat wave, when air conditioners are in heavy use—Columbia will reduce set points on air conditioners, run HVAC systems at lower settings, and turn off lighting, elevators and non-critical equipment. Less stress on electrical grid reduces rolling blackouts and drawing from the dirtiest sources of power that create the most harmful emissions. Columbia’s decisions on reducing consumption will be based on day-ahead notice from power companies that the power grid may be unstable.

**THE RECORD SPECIAL**

COLUMBIA & the Environment

By Barbara King Lord

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Professor Marco Castaldi is hoping to take his environmental research out of the lab and put it on the market—and he is closer than most to doing so. The assistant professor of earth and environmental engineering worked as an engineer in research and development for a company that manufactured emissions reducing catalytic converters for several years prior to coming to Columbia in 2004. He owns a number of patents that could have an impact on the environment.

“Tt is easy to get excited about the potential of your work,” Castaldi says, “but it is really hard to turn that excitement into actual results.” But he is taking steps toward making that happen. In his lab, scientists are working on a process that uses gaseous hydrogen, carbon monoxide, and greenhouse-producing CO2. “We are working to develop a system that could be used to power fuel cell engines—and we hope to have a pilot test off within a year.

The CRG process leverages the attributes of catalytic combustion and radiation heat transfer to efficiently gasify carbon. At the end of a complicated process a stream of CO2 exits the combuster and is ready for sequestration. And the carbon monoxide can be used as a power source—it can actually be fed back into the CRG and used to convert more biomass into its component parts.

“5% scalable and can process 10 pounds an hour of waste to tons a day,” says Morris. “It only takes 10 days to grow a head of lettuce,” says Despommier. “It’s scalable and can process 10 pounds an hour of waste to tons a day,” he says. “We’re sizing it to get it ready for testing.”

If all goes according to plan, the CRG will field a prototype within the next year and have it to market within five years, Castaldi says. He is working with Dr. John Doughter of the Doughter Institute of Physics and Energy.

For the first quarter-century of his career, Despommier focused on parasites, such as the roundworm Trichinella spiralis. When his NIH grant ran out six years ago, he decided to broaden his focus to look at how diseases spread from person to person. The prison culprit was the use of human feces to fertilize crops in developing nations.

Dr. Dickson Despommier of the Mailman School of Public Health has one possible solution for CO2 emissions. He envisions a day when cities grow their crops in 30-story buildings that span entire city blocks. Just one such “vertical farm” could feed 50,000 people, he claims, while freeing up thousands of acres of farmland for newly-planted, global-warming reducing trees.

“We’re extremely convinced that it will be an energy friendly way to raise crops,” he says. “Vertical farming frees up land.” Despommier’s urban sustainability concept has been featured in a number of publications—including a four-page spread in New York magazine earlier this month. But the route he took to local renown was something of a departure for a former NIH postdoc.

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at the effect of reduced air pollution on rainfall patterns.

Nations had been releasing greenhouse-causing gases into the atmosphere since the Industrial Revolution, yet it wasn’t until nearly 200 years later—in the 1980s and 1990s—that global temperatures began to increase dramatically. How could that be?

Liepert is one of a handful of scientists to solve the mystery of what’s come to be known as “global dimming.” She hypothesized that rising temperatures are, ironically, partly a product of our improved environmental stewardship.

Burning fossil fuels creates not just CO2 and other greenhouse pol- lutants, but air pollution. And for years, that smog burned up an “umbrella” that reflected the trapped sunlight back off the earth’s sur- face, keeping daytime temperatures down.

With the passage of Clean Air Acts in the United States and Europe, however, that smog began to dissipate, allowing the full force of global warming to be felt. “The umbrella from the air pollution was like a sunscreen,” she says. “We unmasked global warming and now what we see is the actual effect of greenhouse gas.”

Liepert was able to prove that global warming was actually present long before the Clean Air Act, by showing that nighttime temperatures had steadily increased from 1960 to 1990. That’s because nighttime temperatures are caused by indirect sunlight—heat from other hemi- spheres which is daytime—not directly. As this daytime that could be reflected off the earth’s surface.

Those rising nighttime temperatures still caused some glacial melt- ing. They also affected what is known as “the water cycle.” Without the sun getting through, less water evaporated, which had an impact on rainfall and naturally occurring processes that purify water. That caused some disruption in infrastructures in particular.

In the early days of the environmental movement, none of this was as obvious as the impact of unchecked smog on human health. “Air pollution causes asthma and health effects,” Liepert says. “We had to do something about it.” (see Patrick Kinney’s work on the oppos- site page).

Still, some have hypothesized that the release of some form of par- ticulate matter into the atmosphere—controlled “global dimming”— could someday be used to slow global warming. However, greenhouse gases sit in the atmosphere for hundreds of years, and the small parti- cles that could block the sun only last, at most, a matter of weeks before falling back to earth, Liepert says. In addition, it is not yet fully understood which emissions negatively impact human health, and so far they are all regulated in similar ways.

Lieber is currently analyzing data sets and climate models that look at the effect of reduced air pollution on rainfall patterns.
THE COLOR OF BUILDING: GREEN

By Barbara King Lord

They may have different architectural styles, physical sizes and academic purposes, but there is a unifying element to the three biggest construction projects the University currently is undertaking: They're all green.

These three highly visible projects—the Northwest Science Building, McVicker Hall and Lamont-Doherty Earth Observatory's new geochemistry building—are the strongest statement yet of Columbia's commitment to build within the highest environmental standards. This means seeking Leadership in Energy and Environmental Design (LEED) certification, the nationally accepted benchmark for design, construction and operation of high-performance green buildings," says the United States Greens Building Council. It is the first time the Northwest Science and McVicker are Columbia's first buildings to be registered for LEED certification, and they won't be the last. "As a practical matter, we've begun to use the LEED checklist in our internal planning process for major construction around the University," says Nina Mesa, Columbia's director of environmental stewardship.

LEED uses a scorecard-type rating system that benchmarks in specific areas: sustainable site development, water conservation, energy efficiency, environmentally sound building materials, and indoor environmental quality.

Applying for LEED certification, a voluntary designation, usually starts at the beginning of the construction planning process. That's when project managers, architects and engineers make decisions on how their project aligns with LEED criteria in each key area. For the Northwest Science building, "we're making sure all the descriptors that are in the drawings," says Karrie Wilhelms, a project manager at Facilities and the Department of Capital Project Management.

Because seventy of Northwest Science's fifteen floors are lab areas, ventilating requirements need 100 percent outside air. "Lots of air changes each hour are lab safety concerns; moreover we use lots more water and energy for that square footage than other buildings. So LEED certification for a lab safety lab is more challenging," Wilhelms adds. The design team will work with Labs 21, another voluntary partnership that helps build sustainable high-performance, low-energy labs. McVicker Hall's gut renovation includes putting "practically the entire interior of the building," says Donald Efigenton, a project manager at McVicker. "All lab areas are in the drawings," says Karrie Wilhelms, a project manager at Facilities and the Department of Capital Project Management.

When does Columbia bring to its environmental efforts?

"We are unbelievably strong on earth and environmental issues as well as public health on the academic side and within the student population. It is hard to think of any other institution, frankly, that has the depth of knowledge and expertise on environmental issues that Columbia has. We also have strong leadership from Housing and Dining, and are improving daily on green building issues. What we are working on now is on the operations side and on communications. We know we must conserve energy and look at ways to diminish greenhouse gas emissions, and reduce our greenhouse gas emissions. And to do that, we are putting in place tools to collect information, so we meet in order to go with effective strategies to carry out our goals."

What's on the top of your to-do list?

"I spend a lot of time on green building issues. Existing buildings as well as new construction. Columbia is starting several construction projects over the summer and two of the buildings will be registered LEED buildings. [Leadership in Energy and Environmental Design], a nationally accepted benchmark for the design, construction and operation of high performance green buildings.

What about recycling?

"The biggest category of e-mail I get is on recycling. It's a market for how seriously a campus takes its environmental efforts. There's an urban legend that Columbia doesn't recycle. It's a stubborn myth, and consequently people may not try to recycle. What's true is that there's no central solid waste recycling overseer. That's because each department does its own recycling—catering, facilities. But we want to know if recycling isn't going on that should be, and if we know where or when we can have the problem addressed. I'm currently looking for a recycling and solid waste coordinator."

COLUMBIA GETS A “B” ON GREEN REPORT CARD

E ven universities get report cards. Columbia recently ranked among the top schools in environmental practices, earning a grade of “B” on the first-ever sustainability report card issued by Sustainable Endowments Institute of Cambridge, MA, a special project of Rockefeller Philanthropy Advisors. One hundred colleges and universities in the U.S. and Canada were ranked on their practices in seven areas, with the highest grades of ‘A’ going to Harvard, Stanford, Dartmouth and Williams.

Of the remaining schools, 22 earned a “C” grade. To do that, the university has to lessen the environmental footprint of Columbia."

NILDA MESA

Interviewed by Alex Lyde

POSITION: Director of Environmental Stewardship

LENGTH OF SERVICE: 7 months

FAVORITE QUOTE: “Be the change you want to see in the world.” — Mahatma Gandhi

“My job is to lessen the environmental footprint of Columbia.”

NILDA MESA works fast. Halfway into her first full year as the Director of Environmental Stewardship at Columbia, is working on a number of initiatives to make Columbia “greener.”

As a reflection of how important that mandate is, she reports directly to Senior Executive Vice President Robert Kasdin, who has long been focused on the issue. Born in Cuba and raised in Chicago, Mesa’s immigrant upbringing taught her how to adapt to new environments quickly, a skill she’s used frequently in a career that spans law, environmentalism and even fine art. After graduating from Harvard Law School in 1988, Mesa worked for California’s attorney general, enforcing laws on toxic waste management and natural resources laws. She also held several positions with the Clinton administration, including lead legal negotiator on the environmental side agreements of the North American Free Trade Agreement after its ratification, and as the Assistant Deputy Secretary for Environment for the U.S. Air Force. These jobs, in which she helped craft programs to mitigate environmental impacts and promote environmental justice, mesh well with what she does at Columbia. She is also trained as a fine artist, and lived in rural France for a number of years.

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Another university has people doing jobs similar to yours. Do you talk with them? What do you discuss?

“One aspect of our educational philosophy that needs to be understood is that we’ve always approached community-based learning as a two-sided proposition. One side is teaching our students—whether it’s engineering the liberal arts or social sciences. We want to teach them in ways that help them understand how their work has an impact on society and how to make socially responsible decisions. Equally important to us and to any civic engagement program is ensuring that the community benefits from the work being done by the students. The community must get tangible results. Doesn’t the integration of student learning and community engagement foster socially responsible education?”

Sustainable Endowments Institute