

SOLUTIONS

WINTER 2011

Bears from the Air

Helicopter counts help track climate change

The Household Pollution Equation

How individuals affect the urban environment

Out of Africa

Porter finished his journey on two wheels

Digestive System

Partnership with Fair could boost campus waste-to-energy project



College of Food, Agricultural
and Natural Resource Sciences

UNIVERSITY OF MINNESOTA



Photo by Mary Buschette

Marchers in last fall's Homecoming parade carried signs representing CFANS majors.

Solutions magazine is published two times a year for friends, alumni, faculty, staff and students at the College of Food, Agricultural and Natural Resource Sciences. Like the college, the magazine focuses on how science leads to solutions for today's problems in food and agricultural systems; global climate and environmental change; biodiversity; and bioenergy and bioproducts.

CFANS is composed of six divisions, 13 academic units (two are held jointly), nine research and outreach centers throughout Minnesota, the Bell Museum of Natural History and the Minnesota Landscape Arboretum. The college also participates in many interdisciplinary centers and cooperatives.

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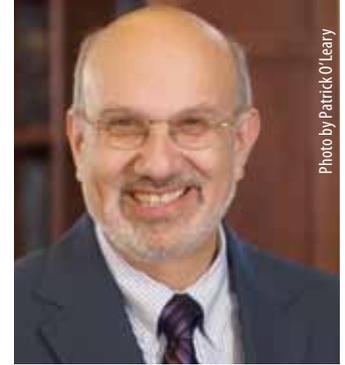


Photo by Patrick O'Leary

From the Dean

Constants in a time of change

Land-grant institutions, contrary to some popular beliefs, are not merely about agricultural development, but rather, about changing the world in a positive, meaningful and enduring way. Land-grant institutions perhaps best represent the very core of what greatness means in American society—namely, equal opportunity for all and, through it, the chance to make our society and the world a better place in which to live.

— from “Defining A Great University,”
by Robert Sternberg,
Inside Higher Ed, Nov. 29, 2010

I’m often asked what our college stands for—are we here to educate students, to do research, to help agriculture and natural resource professionals become more successful?

The answer is, of course, all of the above. As we enter a period of significant changes at the University of Minnesota—with new leadership, a tighter budget and, perhaps, new strategic goals—flexibility will be the key to our future. But overall, the quote above is something everyone in our college community should bear in mind. The big picture—that we are the U of M’s most visible example of the land-grant mission—will remain unchanged, even as the details may shift a bit. You can count on that.

This edition of *Solutions* reflects that mission, with stories that cover our wide and varied areas of interest. You’ll read about food production, energy solutions, biodiversity and climate change all through the lens of our faculty, students and staff. I hope you enjoy this issue. As always, I’m eager to hear your thoughts.

A handwritten signature in black ink that reads "Allen S. Levine".

Allen S. Levine ('73–M.S., botany; '77–Ph.D., nutrition), Dean

Calendar of upcoming CFANS events featured on back cover

On the cover: Polar bears provide clues to climate change's effects.
Photo by Seth Stapleton

BEARS FROM THE AIR

By Becky Beyers

If any animal symbolizes worries about climate change, it's the polar bear.

Polar bears depend on ice to live and hunt in the world's most extreme conditions; if the environment they live in gets too warm, the bears will struggle to survive. That's not because they need to be cold, but because they need ice on which to hunt seals, which constitute 99 percent of the bears' diet. Some scientists now believe that the most southerly population of polar bears in southern Hudson Bay may die out in 25 to 30 years because of melting polar ice.

Counting them is crucial as a barometer of how climate change is advancing in the Arctic.

That's where Seth Stapleton comes in. The conservation biology graduate student has spent summers since 2008 counting bears in Nunavut, a territory in northern Canada, home to nearly two-thirds of the world's polar bears. While scientists have long kept track of the numbers and health of the bears by capturing and tagging them, Stapleton's team is using a new technique: counting them by helicopter while they come ashore during the ice-free summer season.

"Historically, the gold standard of polar bear research has been mark-recapture: biologists physically capture bears, put in ear tags and lip tattoos to mark individuals, and also collect biological samples before releasing them. A population estimate is then based on how many bears were marked and the ratio of marked to unmarked bears in a subsequent recapture sample," he says. But among the native Inuit people of Nunavut, concerns are



rising about the process.

“There’s been a big push to devise techniques that are less invasive and that will allow us to still collect the information that we need to manage polar bear populations properly,” Stapleton says. Aerial surveys also may cover more territory in less time, which could be crucial in the fast-changing Arctic climate.

Aerial surveys have been done before, but often with less-than-satisfactory results, says Lily Peacock, who until recently was the polar bear biologist for all of the vast territory of Nunavut. Because opposition to physically capturing and tagging the bears was rising and because of technical advances in aerial survey techniques, she decided to give them another test. She brought in Dave Garshelis (’83–Ph. D., wildlife), an adjunct associate professor in the Department of Fisheries, Wildlife, and Conservation Biology who specializes in bears. Garshelis, who works full time for the Minnesota Department of Natural Resources, selected Stapleton for the project.

Counting from the air

The aerial survey technique involves more than just counting bears. Even white bears on land can be missed, so the trick is to find out what proportion are actually seen. To do this, the survey team records two crucial pieces of information that correspond with each polar bear sighting: how far away the bear is when first spotted and which observers saw each bear. Both types of information are used to convert the raw count to a population estimate.

The people inside the helicopter—a pilot, two or three scientists and usually a local expert on polar bears—work as two teams, one in front and one in back. “It’s just a variation on mark-recapture, except rather than physically capturing bears, we’re ‘marking’ and ‘recapturing’ them visually by who saw which bear. We also record distances of bears from the flight path to generate what’s called a detection function or sighting curve: those farther away are harder to see so we can calculate the



A lone polar bear navigates the ice near Hall Beach, Nunavut.

proportion we missed based on this curve.”

While the scientists are trying to be less invasive, “we also need to get a good look at them to examine body condition and try to estimate age and sex of the bears. Sometimes that can be difficult from the air,” Stapleton says. “The big males have some characteristics that are pretty distinctive. The females with their cubs are, of course, easy to identify. But smaller males and single females can be challenging to distinguish. So we have to fly fairly close for a couple of seconds. Otherwise, we fly at about 400 feet altitude.”

Most bears don’t react to the helicopter until the helicopter swoops in for a closer approach. Occasionally, a male gets curious and approaches the helicopter when the crew stops for a break. At around nine feet tall and weighing nearly half a ton, the male bears can be particularly intimidating. For the most part, they travel alone, other than mothers with cubs and some small groups of males, known as a “fraternity.” Bears may also congregate where there’s a big

food source such as a dead whale or walrus.

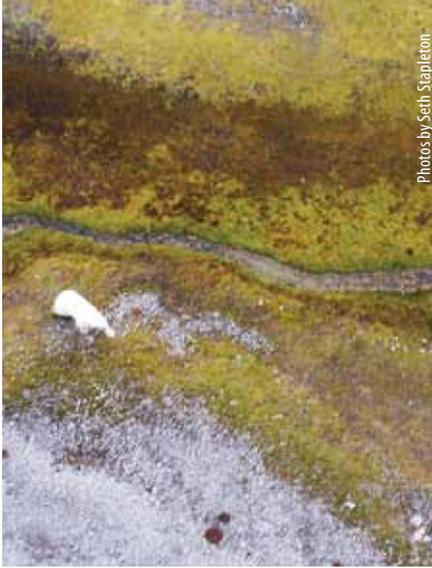
On a good day, the scientists can see as many as 70 or 80 bears; some days they don’t see any.

“We see all kinds of fantastic wildlife,” Stapleton says. On the busy days, “bears are all over the place, so we’re trying to keep track of everything. We don’t get a lot of ground covered on those days but we learn a lot about population distribution.”

The drawback of a single aerial survey is that it doesn’t yield any information on population trends or detailed data about the bears’ health, Peacock says. From a wildlife management standpoint, that data is important; without it, harvest quotas likely will have to be more conservative to make up for the lack of data. But for strictly counting the bears, aerial surveys work just as well, she says.

What they’re seeing

It’s too soon to draw any conclusions about trends in polar bear numbers worldwide. “I think it depends on where



Photos by Seth Stapleton

From 400 feet up, even a huge polar bear looks small.

you are in the Arctic right now,” Stapleton says. His team studies the Foxe Basin area north of Hudson Bay, where the bears seem to be holding their own. But in the western Hudson Bay area—one of the most-studied polar bear communities in the world—scientists have documented a 22 percent decline since the late 1980s. Those numbers are based on mark-recapture estimates, not aerial counts; local Inuits, though, say the estimates are wrong and that bear numbers are increasing.

The Nunavut territorial government has resisted efforts to list the polar bear as a protected species, noting that bears are still abundant across much of the territory. “There’s certainly some controversy,” Stapleton says. “It creates challenges in terms of management and harvest.” The aerial studies are funded in part by the Nunavut government.

Declining numbers south of the area Stapleton’s team studies could be an indicator of changes to come as the effects of climate change move farther north. Far northern populations might even benefit from warming temperatures initially, because changes in the ice could make bear prey species a little more productive.

“The basic problems with the bears in Hudson Bay come from the lengthening of the ice-free season,” he says. “Historically, there’s been an ice-free season in Hudson Bay, so the bears have adapted to it. The bears generally don’t hunt when there’s

no ice, so they go into a fasting mode. When this ice-free season is extended, the animals become more physiologically stressed. Females have a harder time reproducing and some bears may have a harder time surviving. Most biologists are anticipating worsening conditions to come. Even though those populations in the far north may be safe in the near term, there’s a lot of uncertainty regarding their future.”

Bears in the community

Unlike Peacock and Garshelis, Stapleton says he’s “not a polar bear person by trade.” He’s studied snakes, birds, mammals and spent a couple of years in the Caribbean working with sea turtles. He heard about Garshelis’s project and immediately applied, even though he had little experience with bears.

“There are a lot of the same challenges... it’s just a different animal,” he says. “Working with local communities in the Caribbean is very similar to working with the communities in the Arctic. It’s just that in one case the animal of concern is a sea turtle and the other a polar bear. And it’s a little bit colder up north.” Only about 25,000 to 30,000 people live across the vast area of Nunavut, making it one of the least densely populated places in the world.

Nunavut residents often accompany the helicopter teams to lend their expertise in

spotting the bears and local geography, he said. “We want to involve as much of the community as possible... they have a lot of good information from having lived there their entire lives and having information passed down to them from their elders. And I think people enjoy going up in the helicopter and being part of the study. It’s a unique opportunity.”

Local lore blames capture-and-tagging for a variety of bears’ problems, Peacock says, but nothing has been documented. What is clear is that polar bears carry additional meaning, both to the Inuit communities that depend on them and to animal lovers.

“I think all bears create an emotional reaction, probably because they are somewhat human-like, with five toes on each foot, an upright stance and high intelligence,” Garshelis says. “But polar bears are special because they are so big, and white. I think, in general, people have an intrigue with large carnivores—wolves, lions, tigers and bears—and polar bears are the quintessential large carnivore.”

“For better or worse, they’ve been highly politicized,” Stapleton says. “It creates issues for the animals as well as everyone else involved. They are big, cuddly, charismatic, mega-fauna, just like lions or panda bears or sea turtles. And because they’re so dependent on ice, they’ve become a symbol for the change that is happening in the Arctic.” ■

Polar bear families travel in groups, but it’s sometimes difficult to distinguish their age and gender from the air.



Angling for Invasion

Scientist reaches out to anglers to halt spread of earthworms

Minnesota's hardwood forests are fighting a slow, wiggly invasion.

Earthworms are attacking the soils of the northern forests, killing off understory plants and changing the makeup of the ecosystem itself. Once introduced into Minnesota forests, which are not home to any native species of earthworms, the pests can only travel as much as five miles per year on their own. But they are spreading much more quickly around the state's many great fishing lakes.

We have been told worms are good for the soil—so what's the harm in dumping unused bait worms on the shore after a day of fishing? It is true that worms benefit gardens and agricultural fields; they bore through the ground and condition it to the firmness they prefer. Worms loosen the densely packed earth in tilled fields and make it easier for crops to flourish.

In the case of forests, though, with naturally fluffy soils that support an array of trees and plants, worms actually make the ground firmer. While some invasive plant species like buckthorn and sedges thrive in the tougher conditions, most of the understory plants cannot survive. Several valuable tree species like sugar maple and black ash are threatened as well, and it is unclear what the new makeup of the forests will be when they regenerate.

Distinguished McKnight Professor David Andow from the Department of Entomology is leading a project to get the message out to Minnesota anglers that their bait may have more bite than they know.

"We know that there's a huge worm industry for anglers, and we figure they're probably the major group moving worms," Andow says. "Our assumption is that anglers don't want to damage the environment—most people just think that worms are good. So we are testing this by putting educational materials in their hands and seeing whether it can change their behaviors."

In collaboration with the Leech Lake Band of Ojibwe, Andow and his team are working with bait shops at four fishing resorts in northern Minnesota to test the effectiveness of different



combinations of informational signage and stickers on bait containers. Four undergraduate interns from around the state—including two from Native American communities—are analyzing bait purchase and disposal rates during each informational phase. At the same time, the team is conducting surveys to gauge the economic value of such environmental protection labels to determine the cost of widespread application.

"We hope to see that the bait labels do change the way people dispose of earthworms," Andow says. "There are spots where the worms are already established in these sensitive habitats, but if we stop spreading them, they won't get through those forests for a thousand years." —Sara Specht



Photos by David Hansen
Sticker courtesy David Andow

THE

By Sara Specht

HOUSEHOLD + POLLUTION EQUATION

CALCULATING HOW INDIVIDUAL CHOICES AFFECT THE URBAN ENVIRONMENT

Planes blasting off runways, rivers of car traffic and giant smokestacks—those have been the faces of pollution in the city. But with populations in cities and suburbs continuing to expand, individuals are playing larger roles in the urban landscape.

Despite advancements in technology toward energy efficiency in the past 40 years, energy usage and carbon emissions per capita have remained virtually static. People fly and drive almost 50 percent more and consume up to 15 percent more material goods than they did in 1970. In that same period, the U.S. population has flocked to the city; over 83 percent of Americans live in urban areas today. More and more, the choices those individuals make, from transportation to pet ownership, affect a city's complex social and natural systems.

While much research has been conducted on large-scale polluters in cities, little has been done to understand the household movements of elements that contribute to pollution and how individual choices influence those elements. Enter the Twin Cities Household Ecosystem Project (TCHEP), a group of scientists from the University of Minnesota

and partners at the University of California—Santa Barbara.

TCHEP is working to quantify the cycles of carbon, nitrogen and phosphorus elements through households in the Twin Cities metro area: how and why they come in, and where the waste goes. Ultimately Kristen Nelson, an environmental sociologist in the departments of Forest Resources and Fisheries, Wildlife, and Conservation Biology, hopes that understanding what influences these choices will help scientists and homeowners find viable solutions for pollution control.

“Looking at the flow of nitrogen through the urban ecosystem, I came to the realization that it’s what we do—the pollution generation is coming through our households,” says Lawrence Baker, a research professor in the Department of Bioproducts and Biosystems Engineering, the principal investigator who brought the TCHEP team together. “So we’re putting it all together, looking at all components of the household, including travel, natural gas, electricity, food and waste, and then looking at the behavioral drivers behind it all. It’s the first study of its type.”



Student Tim Knudson uses a clinometer to assess tree height in a survey respondent's yard.



The cycle of life

More than 3,000 urban and suburban residents of Anoka and Ramsey counties participated in the first phase of TCHEP's study, responding to a 40-question survey about demographics, lifestyle choices and perceptions. Of that number, 1,940 households granted the team access to a full year's worth of energy records. Finally, researchers visited 360 participant households to collect on-site landscape measurements to estimate element fluxes in the plants and soils. Put together, this data will construct a picture of how these three key elements cycle through a typical city household.

"We're focusing on three elements that I think about a lot, but that most people probably don't," says Sarah Hobbie, an ecosystem ecologist in the Department of Ecology, Evolution and Behavior. "Carbon, nitrogen and phosphorus have important and obvious impacts on land and water, both globally and locally. They enter the landscape through waste, fertilizer and even pets. So we're trying to understand

how much is being stored in the trees and the soils and how much is being lost to the environment. Those flows through urban landscapes are hard to come by."

To process the large amounts of data gathered from such a variety of sources, the researchers created a computational tool they call the Household Flux Calculator (HFC) that translates the information into an annual flux chart of carbon, nitrogen and phosphorus at an individual household level. The elements are identified through seven separate entries into the household, from motor and air travel to human and pet diets, to paper consumption. Then the HFC tracks the elements as they leave the house in different forms, combines all the results and paints a picture of an "average urban household ecosystem."

One key discovery the HFC helped reveal, Hobbie says, is the disproportionality of flows from household to household. For instance, a very small segment of households constitutes the majority of the air travel—they fly often,



Undergraduate student Andrea Woodside analyzes results from more than 3,000 returned surveys.

they fly internationally, and they bring their families with them.

Unsurprisingly, 80 percent of household carbon waste comes from vehicle and air travel and energy consumption. Once released into the environment, carbon becomes the main contributor to global warming. While the general public knows less about nitrogen, in many ways it is as big an issue as carbon. About a quarter of respondents' nitrogen waste resulted from energy and fuel consumption, which also contributes to air pollution. The rest becomes solid waste, which along with phosphorus waste from foods and



Photo courtesy: TCHEP



Photo by David Hansen

Above: Students Mary Kemp and Georgia Rubenstein assess tree canopy dieback and closure on survey respondents' properties.

Left: Sarah Hobbie, Lawrence Baker and Kristen Nelson lead the TCHEP research team at CFANS.

detergents finds its way into waterways causing algae blooms that damage water quality and endanger other aquatic species.

"One of the biggest things we got out of the HFC is that we've quantified what the important flows are for an urban household," Hobbie says. "If we're talking about carbon, home energy and travel are the big inputs to care about. For nitrogen, it's the fertilizer we put on our lawns and the food we eat. Phosphorus is actually coming through our pets, as well as from detergents. So we've learned what the heavy hitters are."

In the project's next phase, the researchers will seek to expand their view of the larger system households participate in. Following the three elements upstream, the team will try to estimate energy and nutrients used in producing and transporting products like food and automobiles. Likewise, they will more closely track waste to pinpoint where it ends up, in order to create a broader ecosystem model. To develop strategies to change future behavior, they will evaluate how the availability of information and a person's social networks can support efforts to make environmentally friendly choices in driving, home energy and lawn care.

The decisions we make

Along with calculating a household's actual impact, the calculator also allows researchers to build models with the data they've collected and compare a variety of factors, like demographics and economic status. Those models allow comparisons of how sectors of the community consume each element differently.

The team is trying to illustrate the choices individuals make that affect the levels of pollutants that cycle through their households and, more importantly, why they make those choices.

Nelson's recent models demonstrate that using programmable thermostats significantly reduces carbon emissions while also saving money. She has also found that attitudes and social norms are related to whether a household fertilizes the lawn or not. The next step of the project will help determine the most effective ways of communicating these findings in a way that will influence the most people.

"Now we have some insight into what people do, why they do it, and what it produces," says Nelson. "The next question is how we can interact with communities and people in different ways that will help them make decisions and develop behaviors that are helpful to the environment. Households are a significant component of urban decision-making. They're part of the solution."

The TCHEP researchers are working to get their research into the hands of those decision makers. They have collaborated with both the Science Museum of Minnesota and the Bell Museum of Natural History to create educational exhibits and a user-friendly version of the HFC. Baker, Hobbie and Nelson are teaching undergraduate courses based on their findings, and they have presented seminars for communities and environmental policy groups.

Ultimately, the scientists hope their findings can help shape effective environmental policy, providing lawmakers with a fundamental understanding of how households consume pollutants and the societal, financial and environmental factors that affect those choices.

"This project takes us away from the traditional end-of-pipe solution," Baker says. "We need to start solving problems in new ways. We need to think about how we generate pollution, cutting it off at the source. This comprehensive approach will give us the tools to move in that direction."



TCHEP PROJECT TEAM

Larry Baker, Department of Bioproducts and Biosystems Engineering

Sarah Hobbie, Department of Ecology, Evolution and Behavior

Kristen Nelson, Department of Forest Resources/Fisheries, Wildlife, and Conservation Biology

Cinzia Fissore, Post-doc, Department of Soil, Water and Climate

Daniel Nidzgorski, Ph.D. student, Department of Ecology, Evolution and Behavior

Sarah Panzer Wein, M.S. student, Water Resources Science

Derek Burk, Research Assistant, Forest Resources

Ina Jakobsdottir, GIS Specialist

Maria Kim, Research Fellow, Forest Resources

In collaboration with

Jennifer King, Department of Geography, University of California-Santa Barbara

Joe McFadden, Department of Geography, University of California-Santa Barbara

Genetic Preservation 101

CFANS scientist coordinates collection of ash tree seeds

Andy David saw it coming.

The associate professor in the Department of Forest Resources saw the devastation Emerald Ash Borer (EAB) wrought on trees in his home state of Michigan starting back in 2002. He wanted to do something before the insect's inevitable arrival in Minnesota, so he devised a plan: collect ash seeds from all across Minnesota and store them for future use.

As expected, the beetles arrived in Minnesota, in 2009, and have been confirmed in the far southeast and Twin Cities areas. The EAB's larvae kill ash trees by chewing on inner bark, disrupting the trees' ability to absorb water and nutrients.

The collection effort is proactive, before the invasion gets worse, as it likely will, David says. "We are collecting and hoping that we never need the seed," he says. "Ideally, forest entomologists will come up with a solution to EAB and the collected seed would serve some other research or reintroduction purpose."

The team, known as the Minnesota Ash Seed Collection Initiative, has been collecting for three years, stockpiling seed from nearly every corner of the state, he says. Team members include

several state and federal agencies, as well as volunteers.

In 2010, collectors focused on new areas where little seed had been gathered. Minnesota's 900 million ash trees vary widely genetically, and they've also evolved differently depending on location. So, for example, David says, "we should not be collecting black ash in Houston County and expecting it to do well in Koochiching County; the climate is too different."

Seed collectors record information on the tree source, where it was collected and other details, then send the seeds to the North Central Research and Outreach Center in Grand Rapids, where David is based. At the center, they're cleaned to remove any debris. Eventually the seeds go to national repositories in Iowa, Colorado or Georgia, where they're dried to remove almost all moisture then frozen and kept at -18 degrees F; the seeds remain viable for up to 20 years.

It's unclear how scientists will know when EAB has left an area so ash trees could be reintroduced with the seeds, David says. It's also possible the seed collections will be used for breeding purposes—if one seed source turns out to be EAB-resistant,



Ash-tree seed collectors gather information on the source of seeds as well as other details about each collection site.

for example, it could be used in developing new species with stronger resistance to the pests.

For now, though, David and others stress the importance of containing or slowing the spread of EAB by obeying quarantine and wood-transporting rules. "The take-home message is that we really need to be careful about what materials we ship around the world and what else is carried along." —Becky Beyers

To volunteer, visit
forest.nrri.umn.edu/ash



New faculty join several departments

Faculty members who joined CFANS this fall include:

Kyungsoo Yoo

Department of Soil, Water, and Climate



Timothy Beatty

Department of Applied Economics



Michael Boland

Department of Applied Economics



Allen Bridges

Department of Animal Science, North Central Research and Outreach Center, Grand Rapids



Bradley Heins

('98—B.S., animal & plant systems; '06—M.S.; '10—Ph.D., animal sciences)



Department of Animal Science, West Central Research and Outreach Center, Morris



Jason Hill

('04—Ph.D., plant biological sciences) Department of Bioproducts and Biosystems Engineering



Brian Aukema

Department of Entomology

James Forester

Department of Fisheries, Wildlife, and Conservation Biology



Photo courtesy Bellmont Associates

Make it four Princess Kays in a row

Katie Miron, an agricultural education major in CFANS from Hugo, was crowned the 57th Princess Kay of the Milky Way at the Minnesota State Fairgrounds on Aug. 25. She'll be the official goodwill ambassador over the next year for Minnesota's nearly 4,700 dairy farmers. She's the fourth Princess Kay in a row who's a CFANS student; all four are pictured above. From left: Ann Miron Tauzell, Katie Miron, Elizabeth Olson and Kristy Mussman Miron. This marks the second time two women from the same family have been crowned Princess Kay; Ann and Katie Miron are sisters, and Kristy Miron is their sister-in-law. Olson's sister, Sarah Olson Schmidt, was Princess Kay 2002.

Statewide Speakers Tour features research and outreach centers

Every academic year, speakers from the University of Minnesota Alumni Association travel across the state talking about current university issues and the university's impact on the state. This year's Statewide Speakers Tour program, "Building and Sustaining a Strong Economy: The University of Minnesota's Unique Role," highlights the connection between the nine Research and Outreach Centers associated with CFANS and their impact on teaching, discovery and the state's economy. The tour kicked off Aug. 19 in Marshall and will stop in 50 different communities over the next few months. Email solutions@umn.edu if you would like to receive a copy.

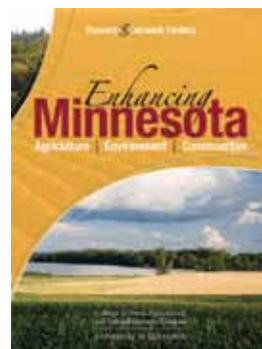


Photo courtesy MacArthur Foundation

Marla Spivak wins "genius grant"

Department of Entomology professor Marla Spivak is one of 23 recipients of the 2010 MacArthur Fellowships, also known as "genius grants." Spivak, a nationally and internationally respected expert on honeybees' health, is developing practical applications to protect honeybee populations from decimation by disease while making fundamental contributions to our understanding of bee biology. She's only the second U of M faculty member to receive one of the grants. MacArthur Fellowships come without stipulations and reporting requirements and offer fellows unprecedented freedom and opportunity to reflect, create and explore.

Carl Rosen named head of Department of Soil, Water, and Climate

Carl Rosen, a faculty member since 1983 in the departments of soil, water, and climate and horticultural science, is the new head of the Soil, Water, and Climate department. He's also held an Extension role that included training regional educators across the state. In the past few years, he's also stepped into leadership positions as interim head of the Horticultural Science department and as CFANS interim associate dean of Extension.



Classroom Office Building renamed Ruttan Hall

The Classroom Office Building on the St. Paul campus, home to the Department of Applied Economics, has officially been renamed "Ruttan Hall," in honor of the late Regents Professor Vernon Ruttan, a faculty member in the department for more than 40 years who died in 2008. Ruttan joined the department in 1965 as a professor and department head; he held those dual roles until 1978. He was world-renowned for his expertise in agricultural and economic development, author of several books and was recognized by many professional and academic organizations for his work.

Hutchison appointed head of entomology department

William Hutchison has been appointed head of the Department of Entomology, where he has been a professor and Extension entomologist since 1989. His research-based outreach program includes a landscape-level, systems approach to integrated pest management that assists Midwest vegetable and grape growers, sweet corn processors and crop consultants in making pest management decisions. He has received several awards for outstanding service and leadership, including the 2007 Distinguished Achievement Award in Extension, from the Entomological Society of America. He replaces David Ragsdale, who accepted a position as head of the entomology department at Texas A&M University.



SUSTAINABILITY FILM SERIES '11

QUEEN OF THE SUN
March 1 • 7pm | The Film Society

GHOST BIRD
March 17 • 7pm | Bell Museum

THE GREENHORNS
April 5 • 7pm | The Film Society

WINDFALL
April 21 • 7pm | Bell Museum
International Film Festival rates apply

TRUCK FARM
May 3 • 7pm | The Film Society
International Film Festival rates apply

**GREEN SCREEN:
STUDENT GROWN FILMS**
May 12 • 7pm | Bell Museum

**BETLE QUEEN
CONQUERS TOKYO**
May 19 • 7pm | Bell Museum

Regular Adults \$8
Children Under 12 \$5
Bell Museum members \$5
The Film Society members \$5
U of M students free
Other students \$5

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Rob King takes helm of The Food Industry Center



Longtime Department of Applied Economics professor Robert King has taken over leadership of The Food Industry Center (TFIC) following the retirement of founding TFIC Director Jean Kinsey. King, a former head of the department, studies local food systems, organic agriculture and management issues facing food retailers, farmer cooperatives and farmers. He has been involved with numerous projects at the center since its founding in 1995 and has been a faculty member in the applied economics department since 1983.

A plan for Minnesota's water future

The Water Resources Center recently completed the first comprehensive report designed to protect and preserve Minnesota's lakes, rivers and groundwater for the 21st century and beyond. Lead author and center co-director Deb Swackhamer presented the report to the Minnesota Legislature on Jan. 5.



Photo by David Hansen

Ron Phillips honored with agronomy society award

Regents professor emeritus Ron Phillips ('66—Ph.D., genetics) was honored at the 2010 Crop Science Society of America annual conference with its Presidential Award. The award is given to "persons who have influenced the science or



Photo by David Hansen

practice of crop production so greatly that the impact of their efforts will be enduring on future science." Phillips retired in 2010 after 42 years in the Department of Agronomy and Plant Genetics and earned many other high honors during his career, including the Wolf Foundation Prize in Agriculture in 2007 and the Siehl Prize in 2010.

Siehl Prize for Excellence in Agriculture winners to be announced in March

Outstanding contributions to agriculture and the alleviation of world hunger will be recognized with the 2011 Siehl Prize for Excellence in Agriculture. This year's winners will be announced in mid-March as part of National Agriculture Week and will be honored at a ceremony in May on campus.

Recipients are chosen in three categories: knowledge (teaching, research and outreach), production agriculture and agribusiness. The Siehl Prize was created by a generous gift from philanthropist Eldon Siehl, who was concerned that people were losing touch with their agrarian roots and wanted his gift to ensure that achievements in agriculture would be recognized and celebrated.



CFANS Alumni Society honored

The University of Minnesota Alumni Association honored its outstanding alumni volunteers, groups and programs at the 2010 Alumni Awards Celebration in the McNamara Alumni Center. CFANS earned two distinctions: the CFANS Alumni Society received the "Program Extraordinaire Award" for its annual Golf Scramble for Scholarships, and alumnus Kent Horsager ('84—B.S., agricultural economics) was honored as the University of Minnesota Alumni Service Award recipient for the college. Horsager is a member of the Alumni Association's National Board of Directors and is also chairman of CFANS' Science Achievement Award program. Pictured from left: Chawal Hongprayoon, Dallas Bohnsack, Kent Horsager, Beth Horsager, Phillip Horsager.

NASA, Interior Department recognize Marv Bauer's contributions



Department of Forest Resources professor Marv Bauer is the 2010 winner of the William T. Pecora Award, in recognition of his pioneering work in remote sensing of natural resources. The award is presented by NASA and the U.S. Department of the Interior.

Report shows another successful year in research funding

A new report from the Office of the Vice President for Research shows that CFANS had a successful year in sponsored research funding, ranking fourth among colleges at the University of Minnesota. CFANS faculty and staff generated more than \$75 million in grants in fiscal year 2010, a \$24 million increase over 2009. The three greatest sources of funding were the U.S. Department of Agriculture (28 percent) the state of Minnesota (13 percent) and the National Institutes of Health (12 percent). The Department of Bioproducts and Biosystems Engineering drew the highest total of sponsored grant award dollars at more than \$11 million; six other departments also increased their award totals.

McKnight Land-Grant Professor program honors two from CFANS

Assistant professors Chengyan Yue and Brian Aukema have been selected as McKnight Land-Grant professors for 2011–13. Yue, of the departments of horticultural science and applied economics, specializes in horticultural marketing. Aukema, of the Department of Entomology, studies forest entomology. The McKnight Land-Grant program is aimed at advancing the careers of the University of Minnesota's most promising junior faculty.

International conference focuses on food security

"Food Security: The Intersection of Sustainability, Safety and Defense" will be the focus of the annual National Agricultural Biotechnology Council conference, hosted by CFANS in June. The conference will feature experts in agriculture, public health, biotechnology, climate change, and plant and animal biosecurity. Featured speakers include Gene Hugoson, former Minnesota agriculture commissioner; Sen. Amy Klobuchar (D-Minn.), and Daniel Gustafson, director of the United Nations Food and Agriculture Organization Liaison Office for North America. The conference will be June 15–17 at the Hilton MSP Airport/Mall of America Hotel in Bloomington, Minn.

Honorary degree marks commitment to food issues

Jacques Diouf, director-general of the United Nations Food and Agriculture Organization (FAO), was honored with an honorary Doctor of Laws degree from the University of Minnesota last fall. The degree is the highest honor conferred by the university. The FAO and the university signed an agreement last summer that commits both parties to address a range of issues associated with global food security. As part of that commitment, the university plans to enhance its efforts to control the threat of Ug99, and to create the Borlaug International Center for Prevention of Cereal Rusts—a tribute to the humanitarian legacy of Norman Borlaug, the late CFANS alumnus and Nobel Peace Prize winner who created the "Green Revolution" in India and Pakistan with his high-yield wheat seeds that saved hundreds of millions of lives by staving off starvation.

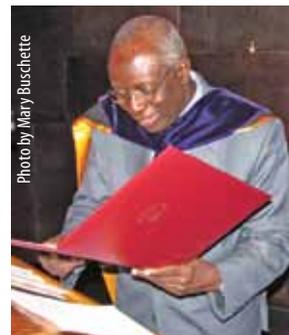


Photo by Mary Buschette

Undergraduate curriculum planning continues

Faculty members from across the college are finalizing details of the CFANS undergraduate curriculum revitalization plan this semester. The plan, designed to meet the evolving needs of students and future employers, is intended to go into effect beginning in fall semester 2013.

Planning for the initiative has been in the works since early 2009, when five task force groups were formed to study best practices and current research in undergraduate education. Their work is now being incorporated into a final plan, which faculty will vote on later this spring. For more about the plan, see www.cfans.umn.edu.



OUT of AFRICA

PAUL PORTER FINISHED HIS JOURNEY ON TWO WHEELS

This time, he rode every inch. Every Fantastic Inch.

Paul Porter, a professor in the Department of Agronomy and Plant Genetics, returned to Minnesota in June after completing the second half of Tour d'Afrique's bicycle tour from the Egyptian pyramids all the way to its southern tip in Cape Town, South Africa. While he was riding, Porter taught a class, "Food and Agriculture from Cairo to Cape Town at 10 mph," via daily blog updates, satellite phone conversations with his students and the help of a teaching assistant and guest speakers back in St. Paul.

The course was first offered in the spring of 2009; while he was riding, students learned about the foods, cultures and climates of the countries on the tour via the speakers, many of whom were U of M professors with firsthand experience working in Africa. Porter rode and blogged for two months, before a pothole in the road sent his bike flying and shattering his arm. When he returned to Minnesota after the crash, he was already hoping to go back to finish his ride in 2010.

On May 15, he rode into Cape Town, South Africa, the final stop on the nearly 12,000-kilometer ride. After more than 120 days of touring, the riders were welcomed by local officials and given



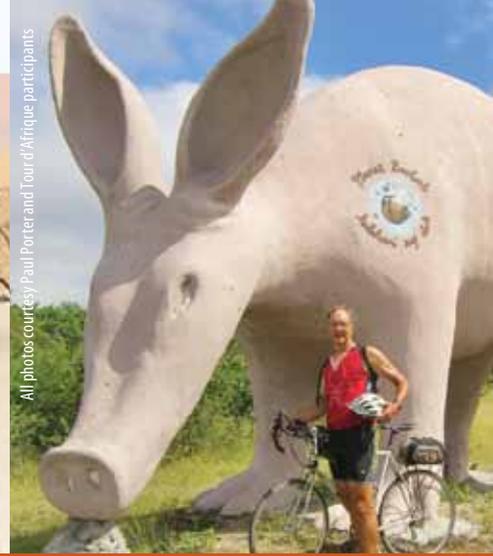
medals to mark their achievement.

Porter had joined the 2010 tour in Nairobi Kenya in mid-March, just before the halfway point and before the spot where his tour ended last year. "It was interesting joining the group then, because they had already gone through a lot; the worst was behind them," he says. "As a sectional rider, you're viewed a little differently" by the people who ride, as they call it, "every fantastic inch" of the tour. But many of the 2010 riders had heard Porter's story and were ready to welcome him back.

He happened to join the tour during a relatively easy few days of rest and shorter rides, but then the tough part began: seven straight days of riding on poor roads. The ride followed the same route as last year, meaning that on the sixth day of the stretch, Porter rode right past the site of his 2009 crash. The pothole was gone.

"That same day, at the lunch stop, they told us we were at the halfway point of the ride," he says. "That's when it hit me, how much more riding there would be and how much more there would be to see."

Southern Africa was a more challenging subject for blogging and teaching, simply because there's less agricultural land, he said. In northern Africa, irrigation allows a much broader diversity of crops and



All photos courtesy Paul Porter and Tour d'Afrique participants

BY BECKY BEYERS



terrain, but the latter half of the tour took the riders away from major waterways. “Through Namibia and Botswana, it’s much drier, not as many homes, but with beautiful vast open deserts and rangelands,” Porter says. Towns were small—basically a filling station and a lodge—often with 50 or fewer residents, with most food imported from nearby South Africa.

The tour group’s chef, James, cooked for the 2009 tour and returned the next year; he posted blog items for the class during the weeks before Porter joined the 2010 ride. His great talent, however, was finding local foods to use for each day’s meals—transporting food to the remote locations would be too costly—and providing healthy, filling meals for the 60 or so riders, all on a 3-burner camp stove. With average daily rides of 75 miles, each rider burned and needed to replenish a lot of calories.

Porter notes that as the tour got further south, the food became more Western and more plentiful. “In the last three countries, the grocery stores were almost like a store you’d see in the U.S., only with more tropical foods,” he says.

Temperatures dropped as the tour got further from the equator, reaching 38 degrees F on the last night the riders camped out before arriving in Cape Town. But for Porter, the ending was warmed by renewed friendship.

One of his fellow 2009 riders lives near Cape Town and joined the 2010 tour for the last 30 kilometers so he could finish with Porter. When they arrived, he presented Porter with a book of written congratulations and encouragement from nearly all of the more than 50 riders who had started the tour together in January 2009. “It was a total surprise,” Porter says. “I was just overwhelmed.”

While the most important thing he got from the trip was new friends, Porter says he also gained new perspective about the world’s food supply system as he pedaled across the continent.

“Africa is huge and diverse. We went through 10 countries with 10 currencies and way more than 10 languages. The continent of Africa could feed the world... I saw great potential and productivity,” Porter says, but rural African farmers lack a market structure and often, simply have no way to get their products to consumers. “As an agronomist, I can see that part of what they need is better seeds and access to capital, but in many ways it comes down to infrastructure. When rural people are spending a good part of their day just getting water and cooking fuel, not much is going to change until you deal with that.” ■

Paul Porter and his fellow riders captured scenes of African agriculture and culture throughout their journey.



Vine-ripened tomatoes in early July? Fresh lettuce into November? For Minnesota gardeners and vegetable producers, those harvest dates may sound incredible—but they're entirely possible thanks to years of research on high tunnels.

The tunnels, also known as “hoop houses,” have been around for decades, but their low energy and setup costs have led to growing interest in them from home gardeners and commercial growers. That popularity has CFANS researchers spending more time evaluating how the tunnels work in a variety of climates and growing situations.

“Initially, it was ‘what can we grow?’ but now the research has moved into ‘how do we refine this growing system to make it work better?’” says Dave Wildung ('72–Ph.D., horticulture), who in 2003 pioneered the use of high tunnels at the North Central Research and Outreach Center in Grand Rapids. Today, the tunnels are in use at research and outreach centers across the state.



High tunnels are being tested at Research and Outreach Centers across the state to see how different crops perform in different situations.

Vegetables from the south and southwest

At the Southwest Research and Outreach Center near Lamberton, increased interest in local and organic food production led to the tunnel's first full year of production in 2009, says Kelley Belina ('01–M.S., applied plant science), research fellow at the center. The 2010 growing season began in April, when cucumbers and tomatoes were

planted, about six weeks ahead of when they could safely be planted outside. The tunnel did use some supplemental heat on a few spring nights when the temperature dropped below 40 degrees, she says.

This year, the center will do replicated experiments on vegetables at three new tunnels, which will provide more data about soil fertility and will compare the performance of different varieties and growing techniques.

The original tunnel—which was severely damaged during a windstorm in late June last year—was one of only a handful in southwestern Minnesota, where local and organic food production is becoming more popular, Belina says. “There is a lot of interest, both from growers who want to sell their produce and from home gardeners,” she says. “A high tunnel is one way to increase the

By Becky Beyers

RESEARCH DETAILS HOW HIGH TUNNELS EXTEND THE GROWING SEASON

hoop DREAMS

time local food is available in Minnesota.”

Scientists at the Waseca and Rosemount research centers also are growing fruits and vegetables in tunnels, but with a very different focus: increasing the concentration of compounds shown to benefit human health in common foods by experimenting with different kinds of growing conditions.

Back at Lamberton, research includes experimenting with “green manure”—cover crops grown to enrich the soil—and how it works in a tunnel. “We used hairy vetch, and had some concerns that it might grow too fast and get out of control, but it didn’t,” Belina says. When the new tunnels arrive, further experiments with cover crops will show how much difference cover plantings make in terms of soil quality and moisture retention.

Before vegetables could be planted in the tunnel’s raised beds, southwestern Minnesota’s rich black soil needed amending with sand and compost, Belina says. Because no rain gets into a tunnel, researchers have found that black plastic mulch helps reduce the amount of irrigation needed.

In the tunnel’s first year, Belina found there are a few drawbacks: For one, tunnels’ temperatures need frequent monitoring, and growers need to learn new techniques, such as training vines to grow up trellises. “It can get really hot in here, really fast,” she says. When that happens, the plastic walls can be partially rolled up to let in cooler air.

Still, interest is growing. A season-extension workshop last spring drew 80 people, many of whom said they were considering putting up their own tunnels. “There’s a lot of interest as there are not many high tunnels yet in this part of the state,” Belina says.

Fruits of the north and west

Back in the early 2000s, “people were beginning to talk about tunnels, but nobody in Minnesota was really doing it,” especially in the far north, says Wildung, who retired from the Grand Rapids center in 2007. “We started with a wide range of vegetable crops—tomatoes, cucumbers, peppers, and so on. It was funded with a two-year grant, and basically we just wanted to see how

different crops would respond. It turned out tomatoes had the greatest potential.”

Eventually, because of the center’s long history with growing fruit in cold climates, tunnel research there naturally turned to berry production. “Our growing season is so short up here,” he says. “In April and May we get a lot of sunshine, but the growing temperatures are just too cool. We found pretty quickly that with a tunnel, we could add May and most of June to our growing season at a very low cost.”

Near the state’s western border, scientists at the West Central Research and Outreach Center in Morris are studying how high tunnels can be used in producing pesticide-free raspberries.

“When we started, our primary interest was in eliminating fungicides,” says Steve Poppe, the horticultural scientist who oversees the tunnel project at Morris. Conventional fruit production requires fungicides and pesticides, but a tunnel allows growers to significantly reduce that use. One project at the WCROC has involved the use of wool mulch as a weed blocker, with some success; researchers are looking at how to get rid of spider mites without having to use non-organic insecticides.

Around Morris, locally grown foods are a hot topic. Most of the fruit grown in the high tunnel last summer was used at

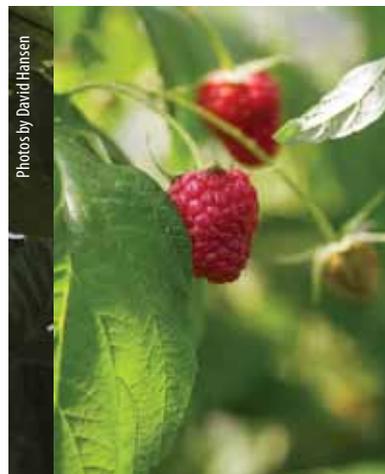
nearby University of Minnesota-Morris food services events. Community volunteers and university students helped pick the fruit, which Poppe said was a good opportunity to showcase a science-based experiment.

Research also has expanded beyond the tunnel, to a project in which UMM students are surveying high-tunnel users about their experiences, whether they think the tunnels produce higher-quality food and whether they think the additional work of a tunnel is worth it.

“We want to grow more growers,” Poppe says, “so we’re looking more at ‘what can we share with them?’”

Each December, high tunnel growers and scientists gather for a conference that brings together scientists from research centers around the state as well as commercial and hobby producers. All of the scientists at the CFANS research centers are involved, along with Terry Nennich (’98–M.Ed., agricultural education), a University of Minnesota Extension professor based in Crookston who’s known as a leader in statewide high tunnel research. All say they see their work as a joint effort, even though each location’s tunnel research is unique.

“We’re not all doing the same thing,” Belina says, “but any research we do can be shared around the state and people will use it as it applies to their situation.” ■



Photos by David Hansen



Inset: Raspberries were among the first fruit crops tested at the North Central Research and Outreach Center in Grand Rapids. Main: Steve Poppe works on berries in a tunnel at Morris.

By Becky Beyers

Rummaging through trash and manure in a hazmat suit is one sure way to attract attention, even at the Minnesota State Fair.

George Johnson (B.S., '80, Soil Science) found that out last summer after making his collection rounds on each of the Fair's 12 days. As part of his job at engineering firm Short Elliot Hendrickson (SEH), he was charged with gathering samples from the Fair's ample waste stream.

The samples will be analyzed as part of preliminary discussions between the Fair and the University of Minnesota that could eventually lead to a pilot program where the waste is turned into energy, maybe helping to fuel parts of the St. Paul campus.

If the sample analysis turns out as expected, garbage and manure from the

fair could be combined with manure from the St. Paul campus animal barns and food waste from on-campus dining into an anaerobic chamber where methane would be extracted and turned into biogas. That gas, which burns much like natural gas, could be used for a variety of purposes, from fueling university vehicles to helping heat the campus greenhouses.

The idea isn't new; past studies have shown a biodigester system could work and the idea is supported by university leaders. Funding to pay for starting up a pilot project has been scarce, however, so supporters say adding the Fair to the team might bring added visibility. While no grants have yet been awarded for the latest proposal, the opportunity to collect large quantities of waste during last year's fair was too good to pass up, Johnson says.

What he gathered

Johnson wore the hazmat suit while riding a golf cart around the fairgrounds because he was digging into manure pits as well as trash cans to collect all kinds of animal and food waste. As a specialist in sample collecting who has experience in working with animal waste, he was the SEH employee who drew the hot and sometimes fragrant assignment.

About two-thirds of the fair's waste comes from animals—primarily cows—with another third coming from the food people throw away. "We ended up collecting about 10 different kinds of waste streams," he says, in a dozen or so large freezer bags and five-gallon buckets. The samples are being stored by CFANS until the analysis can be completed.

The analysis will show whether the

DIGESTIVE SYSTEM



Partnership with

Fair could boost campus waste-to-energy project



Ed Welsch, CFANS facilities coordinator, is storing on campus what Johnson collected for analysis.

Opposite page, center: George Johnson spent much of his time at the 2010 Minnesota State Fair collecting various kinds of waste—while wearing an attention-grabbing hazmat suit. Photo by Joe Kimball, MinnPost.

different kinds of waste from campus and the fair can be combined to efficiently produce fuel.

Biodigesters work by taking organic material—in this case, mostly food waste and manure—and placing it in a sealed chamber without oxygen, says Kevin Janni ('76-B.S., agricultural engineering), professor in the Department of Bioproducts and Biosystems Engineering. Inside the chamber, microorganisms break down the wastes into acids, which in turn can be converted into methane.

Biodigester systems come in a wide variety of sizes, shapes and processes, Janni says, and the conversion process typically takes about 21 days. The mix of materials can affect how efficiently a system makes gas; for example, if the original materials contain more food wastes, more gas likely will be created but it may take longer.

"You need three things for a biodigester to work," Janni says. "First, a reliable source of feedstock; you need steady input. Second, you need a reliable process; anaerobic digestion does that. Third, you need a market for the energy, and that's been the challenge with biodigesters in Minnesota."

The methane created by a biodigester can be used in a multitude of ways: to generate electricity, simply burned as a heat source, or cleaned up and put into a utility company's pipeline. It's not yet clear where exactly the energy created by a campus biodigester would end up; that's part of the need for analysis.

System Synergies

If a pilot plant were built on campus, Johnson says it could solve multiple challenges for both the campus and fairgrounds. Traditional waste management can be expensive and space-consuming, and nearby homes and businesses don't always welcome compost piles or garbage trucks.

But in this case, the fairgrounds and campus happen to be next-door neighbors. "You have this unique geographic proximity that eliminates the issues associated with transporting waste through a residential neighborhood, plus it saves on transportation costs."

The next step is finding funding, says Ed Welsch ('96-B.S., business administration),

CFANS facilities coordinator, who is working with several partners to secure the roughly \$150,000 in grants that would be needed to do a feasibility study and begin design work. Ultimately, a total of about \$15 million would cover the cost of building a commercial scale plant that would include facilities for biofuels and environmental-engineering research. No such facility exists on the U of M campuses now, he says. "But the whole idea is to reduce recurring operating costs for the college, and this technology is a way of accomplishing that."

Short Elliot Hendrickson, Johnson's employer, is interested in how the technology could work and perhaps be translated to its clients, which are primarily rural cities and counties, Johnson said. That's why the firm donated his time for collecting waste during the fair. If the university biodigester becomes a reality, the technology might also be useful to SEH's clients that need to save money on their waste disposal or energy costs.

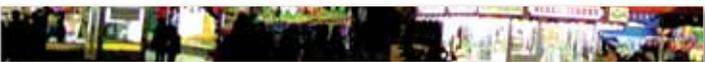
Johnson even speculates that the fair/university/industry partnership could be turned into an exhibit at a future state fair. "It's all part of the sustainability movement, of using our resources wisely, and there's a lot of public interest in that right now," he says.

His travels around the fairgrounds in the hazmat suit and the attention he got prove the interest is there, he says. "It definitely got people talking, that's for sure." ■



Photo by Joe Kimball, MinnPost

The Fair generates 3.6 million pounds of animal and bedding waste each year.



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What nature can teach us about building better structures

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Our buildings have a major environmental impact. The energy they consume—in their construction and daily use—represent the largest single area of energy consumption in the U.S. There are many ways to make buildings more energy efficient and ecologically sustainable. Many of the construction techniques we already use mimic how insects and wildlife build their shelters. But there is more we can learn and apply to our "green" building, carbon footprint, financially down-sized, conservation-minded world.

Exploring the interconnectedness of our shelters and nature is the central idea behind the Bell Museum's "Sustainable Shelters" exhibition, which runs through

July 17. The exhibit includes scale model homes from the past 150 years and their respective carbon footprints, a display that describes the lifecycle of various construction materials, and a 12' square wood stud wall "house" to experience the safety and security shelters provide. Also included are side-by-side comparisons of window glass, foundation walls, permeable pavers and lighting. The exhibit is funded by a grant from the U.S. Department of Energy.

"Visitors will see how animals and insects usually build only as much shelter as they need," says exhibits curator Don Luce. "Humans, on the other hand, have social and cultural objectives in mind when building a shelter. Sometimes, this leads us to build more house than we need, thus building less sustainable shelters."

Current home construction principles urge builders and homeowners to think of their shelters as systems—each part affecting the others. The Sustainable Shelters exhibit hopes to take visitors a step further and view their homes as part of a larger, environmental system.



Pavers that let water through rather than run off the surface can retain more water on the landscape and lessen the impact of significant rainfall events.

"Our climate is changing. Our sources and cost of energy are changing. Can we help visitors understand that houses have a lifecycle, and that how we live our daily lives is the most important way to relate to nature? Are the building renovations we're embracing today—solar panels, tighter building envelopes—well-suited to the future?" Luce asks. "Those are some of the questions we hope to explore with visitors to this exhibit." —Martin Moen

The Sustainable Shelter exhibit contains many interactive features, including a two-person biosphere that provides a nose-to-soil view of plant communities.



Visit the U Solar House

As part of the "Sustainable Shelter" exhibit, the self-sufficient solar house, designed and built by university students, is available for tours. The 500 square foot house finished fifth in a 2009 international competition in Washington DC. Learn more at www.bellmuseum.org.

To be a Gopher!

A message from CFANS Alumni Society president Val Aarsvold



Photo courtesy Val Aarsvold

In her college days, Val Aarsvold posed with a well-known Gopher.

Have you ever thought about what it means to be a Gopher? I'm assuming for many of you, as it has for me, this has changed over the years. When I was a student it was about classes, friends and opportunities on campus. As years have passed since my days of walking the beautiful St. Paul campus, I have become more aware of the impact and value that the University of Minnesota and CFANS have on my life and the role that they play in our state.

When I walked off the stage with my diploma in hand, little did I know that my education wouldn't stop there. Faculty at the University of Minnesota continued to be part of my development as a working professional, keeping me connected with others in my profession. I value these relationships and the ongoing guidance of caring faculty. I find myself calling upon them often, years after my time on campus.

As a consumer, I see the role that the University of Minnesota has on my health and well-being. I appreciate the healthy food choices that have been developed through university research. Research has led Minnesota farmers and others to grow safe abundant crops to meet the needs of growing families like mine and the world population.

So what does it mean to me today...to be a Gopher? It means that I, just like you, have an opportunity to keep the University of Minnesota strong. At a grassroots level, I can speak highly of the University of Minnesota to my friends, family and others in my community. I can share with my legislators the value of the university to the state's economy and the important role the college plays in developing innovative professionals to positively affect the world.

I can show my support as part of a larger group, the University of Minnesota Alumni Association. United, we ensure that future Gophers have opportunities to develop into the leaders that our world needs. If you haven't joined yet, I ask you to join today. It's time for us all to share what it means to be a Gopher!

I'm a member.
I'm an ambassador.

I'm an ambassador because the University of Minnesota improves our standard of living by helping us with everything from our backyard gardens to saving lives with new medicines and medical technologies.

Join the University of Minnesota Alumni Association and be an ambassador for the U's important work. Visit www.MinnesotaAlumni.org or call 612-624-2323.



Val Aarsvold, BS '94
College of Food,
Agricultural
and Natural
Resource
Sciences



UNIVERSITY OF MINNESOTA ALUMNI ASSOCIATION
Where members are ambassadors

BY THE NUMBERS CFANS students 2010–2011

176 NUMBER OF CFANS STUDENTS WHO ARE OLDER THAN

35

218 number younger than **19**

26

85.7

PERCENTAGE WHO ARE FULL-TIME STUDENTS

35.8

Percentage from Greater Minnesota in the class of **2014**

10.4 PERCENTAGE CLASSIFIED AS "STUDENTS OF COLOR" IN THE CLASS OF **2014**

65.4 PERCENTAGE OF FEMALE STUDENTS IN THE CLASS OF **2014**

Percentage from the Twin Cities in the class of **2014**

Source: University Office of Institutional Research

Steve Tobin

STEELROOTS

Touching Earth & Sky

April 16, 2011 – January 31, 2012

Sixteen sculptures...four seasons...infinite wonder.

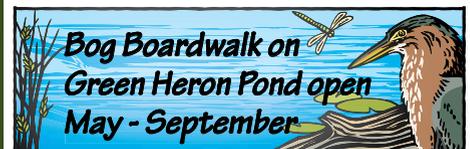


Minnesota Landscape
ARBORETUM

www.arboretum.umn.edu

**3675 Arboretum Drive
Chaska, MN 55318
952-443-1400**

Located 9 miles west of I-494 on State Highway 5 in Chanhassen.

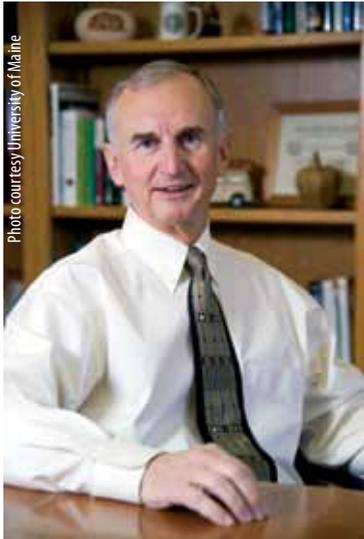


Admission \$9; Members & children under 15: free; April - Oct., free 3rd Thursday after 4:30 p.m., other Thursdays 2 for 1 after 4:30 p.m.

UNIVERSITY OF MINNESOTA

Maine Ideas

Robert Kennedy went from CFANS to University of Maine presidency



Robert Kennedy

At first glance, the University of Maine and the University of Minnesota may seem like very different styles of campus life. But Maine president Robert Kennedy says they have much in common, thanks to his years at Minnesota.

Kennedy, a Minnesota native, earned his undergraduate degree in plant science in 1968, then went on to earn his Ph.D. and assume teaching and research roles at universities across the country. In 2000, he joined the University of Maine as executive vice president and provost and was named president in 2005. Last March, he announced that this academic year will be his last; after retirement, he will begin working on projects for the University of Maine System that concentrate on sustainability, alternative energy and federal initiatives. He's also a finalist to be a University of Minnesota Regent. Over that long career path, Kennedy says, his four years with CFANS shaped many of his ideas about leading a land-grant university.

His experience as an undergraduate student in CFANS was "enormously positive," Kennedy says. "The experience was very instrumental in my future career choices and really prepared me for both my professional and personal life." He fondly remembers his time on the St. Paul campus and says his first mentors were professors and staff members at the college. They have remained role models for the rest of his life, and he tries to replicate the CFANS experience for his students and staff at Maine.

As president of the university, Kennedy interacts a lot with the students and faculty on campus as well as communicating with key constituents. He tracks events and issues at CFANS and the University of Minnesota online, and "I realize that we're both dealing with some of the same issues: energy, 'going green', etc. Our two universities are more similar than dissimilar."

Throughout his presidency thus far, Kennedy has been developing what he calls the "New

Model Land-Grant University," which he describes as a model with added synergy between the university and other organizations.

Because of tighter public financing and increasing demands for more campus efficiency, Kennedy says the new model is needed as a way to communicate and interact with other research institutions, agricultural and natural resource organizations and to emphasize cooperation rather than competition.

For example, the University of Maine is leading a consortium of 30 companies to become a national leader in deepwater offshore wind energy technology, The DeepCwind Consortium. The consortium consists of federal laboratories and multinational companies around the world that deal with the design, construction, manufacturing, policy and analysis of the technology.

Staying up-to-date with trends is important to Kennedy to help him keep in touch and communicate with his students. That's why he has now started blogging. "Social media is becoming increasingly important. Students are more prone to social media as well. The blog helps communication both on the inside, with students and faculty, and on the outside, with alumni, state residents, etc. We're trying to use different communication vehicles to reach everyone from the public to legislators, and blogging is a big portion of that."

Kennedy says he'll always think of Minnesota and CFANS as his springboard. "When you're amidst your schoolwork, you're not aware of the impact on your personal and professional life. CFANS was a wonderful springboard for me and really gave me well-rounded, instrumental, and leadership skills. I was, and still am, very fortunate to have attended the University of Minnesota and CFANS. I'm a big advocate."

—Veronica Hemmingsen

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z.umn.edu/cfansas2010

SUPPORT SCIENCE ACHIEVEMENT

in Your Favorite School District!

This "book award" program recognizes deserving high school juniors across the state of Minnesota who excel in science. The recipient is connected with the University of Minnesota and CFANS in a way that inspires them to strive for greater achievements in science while engaging alumni volunteers and strengthening connections to their communities. Don't have the time? Sponsor a Science Achievement Award that another CFANS alum can deliver.

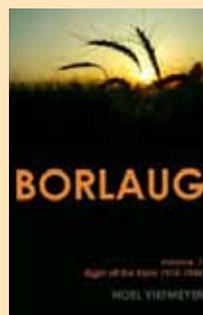
There is no cost to participate in the program—the CFANS Alumni Society provides the book and award certificate.

<http://z.umn.edu/saa>

Easy as 1... 2... 3... 4...

- 1) Volunteer by April 1 by completing the online form.
- 2) Contact your favorite school district to have them identify a deserving recipient.
- 3) Personally present the book and Scientific Achievement Award certificate to the student.
- 4) Bask in the glow of having encouraged a young student!

This year's featured book:



Borlaug: Volume 1

This is a biographical story of Norman Borlaug, a CFANS graduate and Nobel Peace Prize Laureate. Borlaug was a passionate warrior against hunger who is credited with saving over a billion people from starvation.



College of Food, Agricultural
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UNIVERSITY OF MINNESOTA

ALUMNI SOCIETY

**WE
LIED!**

There is a Classes Without Quizzes quiz. If you can identify all the adult faces in the CWQ ad on page 22, you'll have a chance to win a fabulous CFANS prize. Send your answers to solutions@umn.edu.

Can You Identify this Photo?

The faces may be familiar, but what are these forest trekkers doing? Everyone who sends in the correct answer will be entered in a drawing for a CFANS coffee mug. Send your answers to solutions@umn.edu.



Last issue's answer

More than two dozen people wrote in to correctly identify the speaker in last issue's photo, including several people who were at the event. Here's what our drawing winner, Phil Perry, ('67-B.S., forest resources) wrote: "The photo in the spring 2010 issue of *Solutions* is, I am sure, of Dr. Martin Luther King Jr. in April 1967 giving a speech as the Convocation Speaker. I was in the audience. I was a Forestry major and it was my senior year. I remember that an editorial in the *Minnesota Daily* suggested that the event should be moved to the Minneapolis campus because that was where the majority of the students were. We at the St. Paul campus were offended by that suggestion and were glad the location was not changed."

Golf and Give Back

Since 2003
we've raised
over \$125,000 for
CFANS scholarships.

Get involved with the 2011 Golf Scramble:

- Sponsor the tournament or contests
- Donate and bid on silent auction items
- Sign up as an individual or team to golf
- Volunteer to help out with the tournament

GOLF SCRAMBLE FOR SCHOLARSHIPS

Friday, July 8, 2011
Les Bolstad Golf Course
Falcon Heights, MN

For more information about
the tournament and to register:
z.umn.edu/Golf
or contact Mary Buschette
at (612) 624-1745 or
mbuschet@umn.edu



College of Food, Agricultural
and Natural Resource Sciences

UNIVERSITY OF MINNESOTA

CFANS

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The College of Food, Agricultural and Natural Resource Science's Development Staff are available to discuss giving opportunities with you and to answer any of your questions.

Contact us anytime!

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Cooking Up the Future

Scholarship supports aspiring nutrition professionals



Elaine Christiansen, scholarship recipient Heather Hengescht and Louise Mullan at the Thanksgiving for Scholarships dinner.

Editor's note: At this fall's Thanksgiving for Scholarships dinner, CFANS supporters Elaine Christiansen and Louise Mullan spoke about the Louise Mullan Scholarship in Nutrition, established in 1998 to honor Mullan, a faculty member in the Department of Food Science and Nutrition from 1970 until her retirement in 2001. The scholarships are for students with strong financial need and who are in under-represented populations. These are edited remarks; you can see the complete speeches along with other presentations at the dinner, at www.cfans.umn.edu/CFANSGiving/ThanksgivingforScholarships.

Elaine Christiansen: I met Louise in 1979, before there were countless opportunities for catering and food service options for community groups and families; families and volunteers were doing their own food preparations for large groups. Our Twin Cities home economists group recognized an opportunity to help volunteers who were responsible for church, community and large family meals. We helped develop workshops for managing large group receptions. Louise was one of the specialists who worked with us.

When Louise recommended me to Elwood Caldwell, the [food science and nutrition] department head, as a lab assistant for her quantity food production courses, I panicked a bit but I said yes. It was one of the best yeses I've ever said in my whole life. During the ensuing five quarters, I became aware of Louise's dedication and commitment to her students. Louise was never too busy to spend as much time as a student needed, but she was not namby-pamby. She expected great things from these young people.

Life moves along. My work with Louise in the lab ended and I became a full-time editor at Pillsbury publications. Meanwhile, our friendship continued and Louise and I recognized our similar philosophies of outreach to those students in need, especially those from diverse backgrounds and those whose goal it was to improve nutrition in underprivileged communities.

I was finding my work at Pillsbury challenging and satisfying and also meeting my financial needs. It was time to share and give back. It was time to recognize my friend, Louise Mullan, for her exceptional devotion to students and to fulfill my wish for sharing with others by establishing a scholarship in her name. It was a proud moment when we signed the agreement.

From this small beginning, the fund has grown, and to date 13 students have benefited from it. Just think of that.

Tonight there is generosity in this entire room; proud and happy donors of all financial and emotional means. These contributions extend student hopes and dreams, but students, you carry on the future in ways we've never imagined and that becomes an awarding extension of our lives. So thank you.

Louise Mullan: In 1956, I left western Pennsylvania for Iowa State College of Agricultural and Mechanical Arts in Ames, which is now Iowa State University. I had \$500 total. I was privileged to have a scholarship each year and to work for my board and room. When I came here as a faculty member in 1970, my appointment was 70 percent resident teaching and 30 percent extension. And that gave me both joys, the opportunity to work with students and to be out in the community. I advised many students, often about 50 at a time.

For me it was a very humbling experience to be given this honor and this recognition. A tradition in the Department of Food Science and Nutrition is that when someone retires, some sort of gift is collected. And usually the gift is either cash or something very personal . . . and since I neither needed nor wanted pink golf clubs or a new sail for my sailboat, I was really thrilled that there was a mechanism when I retired to deal with people's generosity. Many of my colleagues contributed, as well as friends, and now the scholarship is endowed and we will continue.

In the challenging world that we live in, it's a privilege and special grace to have a scholarship that reflects both my values and those of Elaine and Hal (Routhe) and to know that we are helping other students. Thank you.

DISCOVER CFANS

Photos by David Hansen



For almost 50 years, the most destructive rust disease, stem rust of wheat and barley, has been kept in check worldwide by efforts that began in Minnesota. But today, new strains of the disease threaten the world's food supply. The St. Paul campus is home to a large concentration of wheat rust scientists who are working around the world to stop the spread of the disease and to develop new, resistant varieties.





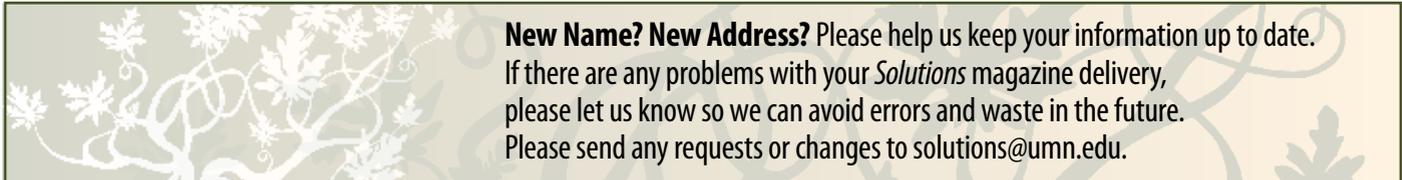
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CFANS 2010 CALENDAR OF SPRING EVENTS

These are some of the many events supported by the College of Food, Agricultural and Natural Resource Sciences. All are open to the public; some may require a registration or fee to attend. Visit www.cfans.umn.edu/Events2.html or contact Honey VanderVenter at 612-625-6710 or hvander@umn.edu for more information.

April 2

Classes Without Quizzes
University of Minnesota, St. Paul campus

May 1-3

Minnesota FFA state convention
University of Minnesota, St. Paul campus

May 13

CFANS undergraduate commencement
University of Minnesota campus

May 26

Siehl Prize laureate ceremony
McNamara Alumni Center

JUNE 15-17

Food Security: The Intersection of Sustainability, Safety and Defense
Hilton Minneapolis/St. Paul Airport-Mall of America Hotel

July 8

Golf Scramble for Scholarships
Les Bolstad Golf Course, Falcon Heights

August 1-3

University on the Prairie
Southwest Research and Outreach Center, Lamberton

September 6

Fall 2011 semester begins