{ *Navigation tools* }

COVER / BACK PAGE

ENLARGE QUADRANT

RETURN TO SPREAD VIEW

PREVIOUS / NEXT PAGE

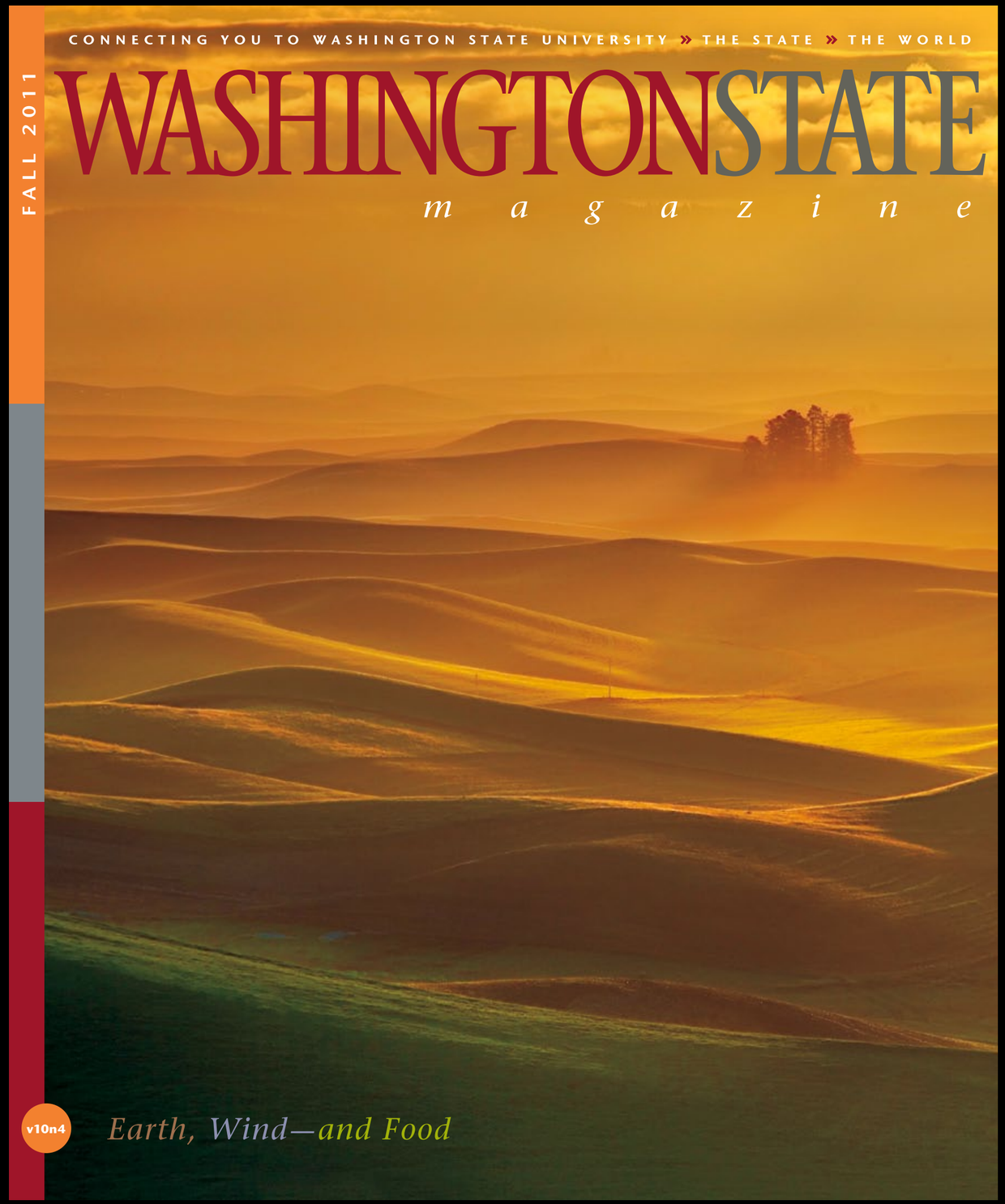
PREVIOUS / NEXT PAGE

TABLE OF CONTENTS
CLICK ON TITLES TO GO TO STORY

SCROLL PAGE
(IN ENLARGED VIEW)

WEB LINKS
URLS IN TEXT & ADS ALSO CLICKABLE

CLICK HERE TO EXIT
OR USE ctrl/cmd-Q



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WASHINGTON STATE UNIVERSITY

FALL 2011

WASHINGTON STATE magazine

FEATURES

PANORAMAS

DEPARTMENTS

TRACKING

Cover photo: *"Small Forest in the Palouse Hills" by Chip Phillips*

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Behavioral Challenge

1st Place
Camas High School, Camas
The Green Machine — Education Through Compost

2nd Place
Ellensburg High School, Ellensburg
The Bike Wind Map Project

3rd Place
Heritage High School, Vancouver
Promoting Biodiesel Across the United States

4th Place
Heritage High School, Vancouver
Energy Games for a Positive Change

Design Challenge

1st Place
Ballard High School, Seattle
Algae Today, Oil Tomorrow

2nd Place
Ballard High School, Seattle
Mycoremediation and Torrefaction

3rd Place
Tahoma High School, Covington
Design for Sustainable Urban and Rural Areas

4th Place
Auburn High School, Auburn
What's Lighting Your Street?

Technological Challenge

1st Place
Bellingham High School, Bellingham
Mycoremediation and Biofuel Production: An Investigative and Comparative Analysis

2nd Place
Redmond High School, Redmond
Flying for the Future

3rd Place
Ballard High School, Seattle
Charging Tomorrow

4th Place
Pullman High School, Pullman
Powered by Learning

Multidisciplinary Collaboration

1st Place
Heritage High School, Vancouver
Biochar Energy and Enrichment

2nd Place
Ferndale High School, Ferndale
Anaerobic Digester

3rd Place
Pullman High School, Pullman
Revolutionizing Public Transportation

4th Place
Secondary Academy for Success, Bothell
Sustainable Packaging

Additional Awards

Most Innovative
Pullman High School, Pullman
Powered by Learning

Most Likely to Succeed in the Marketplace
Ballard High School, Seattle
Charging Tomorrow

Community Impact Award
Ferndale High School, Ferndale
Anaerobic Digester

Global Impact Award
Hudson's Bay High School, Vancouver
Off-Grid Wastewater Treatment

Advisors' Favorite
Pasco High School, Pasco
Efficient Windmills

Most Inspirational
Lake Roosevelt High School, Coulee Dam
Healing Light

New Participant Awards

Congressional District 1
Secondary Academy for Success, Bothell
Sustainable Packaging

Congressional District 2
Granite Falls High School, Granite Falls
Racing Toward a Greener Future

Congressional District 3
Hudson's Bay High School, Vancouver
Off-Grid Wastewater Treatment

Congressional District 4
Ellensburg High School, Ellensburg
The Bike Wind Map Project

Congressional District 5
Sprague High School, Sprague
Sustainable Electric Car

Congressional District 6
Clover Park High School, Lakewood
Warrior Tech

Congressional District 8
Tahoma High School, Covington
Design for Sustainable Urban and Rural Areas

Congressional District 9
TAF Academy, Kent
APEC

first words

Westward Ho! :: There was a time, not so long ago, in our great Northwest when boundaries were not a great concern. When the first non-Indian settlers reached the Palouse and the Columbia Plateau, they could look to the distant horizon and see nothing but blue sky and virgin prairie and shrub-steppe, potential farmland as far as they could imagine. And as they learned to know the land, they reveled in what the college scientists told them, of seemingly endless topsoil, of windblown loess 200 feet deep. But even as that soil washed and blew away at an unsettling rate, they also learned to ignore the worries of those same scientists and wiped the dirt from their foreheads with studied denial.

Nevertheless, a providential climate, fertile soil, and, in the drier regions, massive irrigation projects helped create the agricultural paradise the pioneers had dreamed of as they loaded their wagons, turned their backs on an exhausted East, and pointed their oxen West.

But that golden period of conquest and opportunity was soon expired. The endless land filled up, an agricultural empire finally bounded by ocean and desert and international border. And now, slowly, we're starting to understand that the geographical sorts are not the only boundaries that hem us in.

In a recent paper in *Nature*, Johan Rockström and colleagues urge that a "safe operating space for humanity" be defined by scientifically determined, quantifiable planetary boundaries. Our home is not as boundless as we'd hoped, and feeding a burgeoning population is unfortunately not entirely consistent with the health of the planet itself. Just as our westward expansion was finally bounded by the Pacific Ocean, our earthly continuation will depend on recognizing the boundaries of climate change, of biodiversity loss, of the nitrogen and phosphorus cycles, of ozone depletion, and other factors.

In an even more recent policy paper in *Science*, WSU soil scientist John Reganold and colleagues argue that if we are to meet these considerable challenges, we must start thinking bigger. Although incremental approaches have established a robust modern agriculture, meeting the demands of both planetary health and a growing population will require a transformative approach that "builds on an understanding of agriculture as a complex socioecological whole."

Anticipating that transformative challenge, the WSU Center for Sustaining Agriculture's Climate Friendly Farming project has explored our impending dilemmas from the perspective of an intriguing observation: "While all economic sectors emit carbon dioxide to the atmosphere, only agriculture and forestry also absorb it."

Over the last several years, the project has identified promising management strategies and technologies that could mitigate agriculture's contributions to the greenhouse gases that are changing our global climate. Among them are reducing the emissions, restoring carbon to soil, and replacing fossil-fuel derived products with biomass-derived products.

Through their aspiration and research, these scientists are leading the way in molding the mission of the land grant university toward the husbandry of a planet that is at once bounded and bountiful.

Tim Steury, Editor

v10n4 FALL 2011

WASHINGTONSTATE
magazine

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WASHINGTON STATE UNIVERSITY
Office of the President

August 2011

Dear Alumni and Friends:

As this magazine goes to press, we at Washington State University are busily preparing for what we expect will be the largest class of incoming freshmen in the history of our Pullman campus.

At a time when state universities face steep budget reductions, our decision to grow our enrollment might appear to be counterintuitive. However, this strategy is consistent with both our vision and our values as our state's land-grant research institution.

Washington needs more college graduates. A report this spring from the Higher Education Coordinating Board is only the latest in a series of studies that sounded that call. Meanwhile, prospective students—most of them from our state—are declaring WSU as their university of choice. This year, we received a record number of more than 13,000 applications.

In the face of that need and that demand, we must open our doors to as many qualified students as possible.

While the numbers will not be certain until classes begin in late August, we are projecting an incoming freshman class of around 4,000 in Pullman. Our previous record was 3,411 in fall 2008.

We expect this will be both a diverse and a well-qualified class. We are projecting that more than 28 percent of the class will be students of color, compared with 24 percent in 2010 and 21 percent in 2009. We are seeing particularly strong increases in numbers of African-American and Chicano/Latino students.

And while it is too early to determine precisely the average grade point averages and standardized test scores of the incoming class, we do know that the WSU Honors College has admitted nearly twice as many students this fall as it did in fall 2010. About 15 percent of the new freshmen have a high school GPA of 3.8 or above.

The obvious question is, how will we be able to guarantee that each individual member of this class will receive a first-class educational experience?

It will take nothing less than a campus-wide effort, which, as you might imagine, is well underway. More residence hall rooms are being made available, more spaces are being equipped as classrooms, and we are making some targeted hires of new counselors and faculty members. We have adopted a number of measures to make us more efficient, to allow us to use available facilities better, and to make it easier for students to graduate on time.

It has made for a busy summer, which is, no doubt, only the prelude to an exciting fall.

This is a team effort and a true reflection of how agile a major institution must be at a time of great challenges and great opportunity.

I am proud of our university for rising to this occasion and I hope all of you are as well.

Warm regards,

Elson S. Floyd, Ph.D.
President

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BROUGHT TO YOU BY THE WSU ALUMNI ASSOCIATION

letters

We welcome your letters as well as commentary left on our website—go to wsm.wsu.edu/contact. You can also post comments on every article online.

Moral capital

I, too, enjoyed Jennifer Sherman's interesting and authoritative piece on Golden Valley in the spring edition. I winced a bit, however, at the "in large part due to the 1992 spotted owl ruling" but, because her story seemed directed toward effects of economic collapse, not causes, I did not write. Then came the summer issue with Gordon Pilcher's leap from "in large part" to apparently placing all blame for employment loss on owl protection.

The issue was not that simple. As a reporter for *The Oregonian* in Washington, D.C., from 1989 to 1993 I had a close-up view at what we dubbed "the spotted owl wars"—bombarded from both sides with enough rhetoric for a decade of political campaigns and enough press releases to have consumed all the spotted owl forests.

Yes, environmentalists did seek Endangered Species Act protection for the owls, but it was never all about the owls. The underlying issue was whether—or how much—of the Northwest's old growth forests should be allowed to remain as old growth. Along with that was the issue of clear cutting vs. selective, or sustainable, logging.

Nor was forest protection the entire issue in job losses. During the controversy a report from academia (Oregon State University's forestry school, I believe) delved into the background of declining employment in the timber industry. It cited as a major factor the mechanization of the industry, especially in the lumber mills. Another factor leading to lower mill (though not woods) employment was the export of raw logs. And yes, environmental issues also were involved.

However, the timber industry did a masterful public relations job in convincing both the public and its employees that the entire loss of jobs was the result of those nasty environmentalists and damned owls. During this same period one company, having cut all its timber in the Oregon Cascades, fired all its employees, closed and demolished its company town and went back down South to faster growing trees, leaving a denuded patch in Oregon.

Eventually almost everyone began to realize that Northwest forests could not sustain unlimited logging forever. The battles over where and how much logging continue and the issues are still a lot more complex than a little bird vs. humans.

Roberta (Bobbie) Tucker Ulrich *'50*
Beaverton, OR

Back in the earth

Regarding John R. Smoot's comment about "Back in the Earth" (Summer 2011): Both Smoot and the original statement are incorrect. The Columbia River at Hanford is not "free-flowing" nor "deep under the backwaters of the dams." The Hanford Reach can be correctly described as unimpounded. The flow is highly regulated by 10 upstream dams.

Duane A. Neitzel *'82*
Richland

The things we do for our dogs

I dearly loved reading every word of this touching, heart warming article by Hannelore Sudermann. We are currently a two-cat family, though we had two dogs at one time. At his age, my husband doesn't think he wants the responsibility of owning another dog, but I am ready to rush out and adopt one this minute!

The photos of the dogs and guardians are wonderful, as well! So good to see Darcie Wolfe's human and canine family after reading about them!

Thanks for making my day!

Sonya (Huang) Lee *'58*
El Cerrito, CA

Correction: "The Perfect Hunt"

Our attribution for Patrick McManus's story "The Perfect Hunt" in the Summer 2011 WSM was incomplete. It should have read: From KERPLUNK! by Patrick F. McManus. Copyright 2007 by Patrick F. McManus. Reprinted by permission of Simon & Schuster, Inc.

HaiCoug contest winners

Congratulations to the winners of the first *Washington State Magazine* HaiCoug contest, featuring haiku poems with a WSU theme. After reviewing almost 100 entries, we chose first, second, and third place HaiCougs based on how they evoked the WSU experience, followed the haiku structure, and presented a clever or thought-provoking twist.

First place goes to Susan Picatti '74 from Seattle. She wins a gift package from the Bookie.

Two day old Evie
In Dad's arms; Cougs beat Huskies
The perfect first game.

The second place winner, Susy (Roark) Benefiel '72 from Walla Walla, wins a can of Cougar Gold cheese from the WSU Creamery.

Warm spring grass beckons
A doze on Holland's front lawn
Uh-oh. Late for class.

Third place, a HaiCoug by Stephanie Pierce '04 from Wasilla, Alaska, also wins a can of Cougar Gold cheese.

Hike up hill both ways
Flip flops on everyone's feet
We all bleed crimson.

Thank you to everyone who wrote HaiCougs. Several others received honorable mention, and you can read them at wsm.wsu.edu/HaiCoug.

STAFF ILLUSTRATION

When wildfire comes to town

by Larry Clark '94 :: Flames ripped through the pines and brush in the Dishman Hills west of Spokane in July 2008, just as they've done for thousands of years. A dry wind pushed the fire up a hill, hotter and faster, and straight into a new development of expensive homes, destroying 13 of them and burning 1,200 acres.

The wildfire's destruction was not surprising or unexpected. But the number of homes and residents who survived the blaze serves as a testament to smart planning, an awareness of inevitable fires, and research into the interaction of fire-prone wildlands and the growing number of people who live near them.

Although the Valley View fire in 2008 caused $50 million in property damage, it could have been worse. Several residents had implemented principles of Firewise Communities, a national program to educate landowners and communities on mitigating damage from wildfires. By thinning trees around homes and reducing fuels, a number of homeowners saved their homes. When the escape route was cut off, people knew to head to a protected ball field.

In the Spokane Valley, not far from the scene of that fire, community volunteers, firefighters, and emergency management professionals learned about the Firewise program at a workshop in May led by Guy Gifford, a forester and educator with the Washington Department of Natural Resources, WSU Extension forester Eric Sjoquist, and others.

Firewise Communities began in Washington state in 2001 after the extremely destructive fire season in 2000. It emphasizes local, easily implemented fire prevention and awareness. Firewise "is not a cookbook. It doesn't say 'thou shalt do this.' It provides a framework that shows there are many ways to get to your solution and make our communities more resilient to wildfire," says Gifford.

To illustrate the program's success, Gifford points past the buildings. "If we just look south of here on the hillside there's a bunch of homes that survived that wildfire three years ago," he says. "There's a direct correlation to home survivability with people who did this type of work."

Encouraging homeowners and communities to think about wildfire couldn't happen at a better time. The number and intensity of fires has increased steadily in the last decade. Millions of acres and thousands of homes have burned each year, including record-breaking blazes in 2006. The cost of wildfires runs into billions of dollars.

The Big Burn and other great fires of 1910 led to a century of fire suppression that emphasized stopping all wildfires, and consequently a hazardous amount of fuel accumulation in forests. In the dry interior west, like northeastern and central Washington, those fuels increase the intensity and frequency of fires.

Climate change contributes to the problem. The number of acres that could burn annually in the West could increase 400 to 600 percent if the average global temperature rises one degree Celsius, according to a study by the University of Washington and the U.S. Forest Service. Warmer

temperatures also speed infestation of bark beetles and other tree-destroying pests that create easily combustible fuel.

At the same time, the human population around wildlands is increasing. America's population more than tripled in the twentieth century, and more people seeking privacy and a natural setting move into what is called the wildland–urban interface, or WUI.

Matt Carroll, a professor in WSU's Department of Natural Resources with a specialty in natural resource sociology, adds that federal agencies, such as the U.S. Forest Service, have had their budgets slashed in recent years.

Above: Wildfire burns near a Dishman Hills residence during the 2008 Valley View blaze. *Tom Watson/Courtesy Spokane County Conservation District.* ***Below:*** Matt Carroll. *Photo Shelly Hanks*

"You've got these three different things going on—fuel loading, people moving in, devolution of federal land agencies. What has resulted is a recognition that communities can no longer rely on Smokey Bear," says Carroll.

Carroll, who has studied wildfires and community and government policy for over 15 years, characterizes the complicated situation as a "wicked problem" in which different stakeholders see fire danger as a symptom of a high-level problem, but disagree on the nature of that problem. This leads to disagreements in how to treat wildfires, distrust of public agencies, and dilemmas in management of forests.

For communities in the WUI, the problem can have very real consequences. Carroll's latest work, with doctoral student Soren Newman, builds on the idea that communities may have specific and local ways to deal with the threat of wildfires, beyond the complexities of forestland management.

Looking at two very different regions with fire as part of their ecosystems—Flathead County, Montana, and Lee County, Florida—Carroll and Newman want to learn what it takes for communities to be resilient and, as Newman says, "What does it take for local communities to better deal with wildfire?"

Carroll and Newman use the concept of adaptive capacity, the intersection of social and material assets, to frame the research. "We talked to local fire people, public safety people, and asked them, 'Tell us about communities in your area that are doing it well, and communities in your area that are not doing it well. Tell us about the difference,'" says Carroll.

Carroll and Newman will then take their results to other scholars who study fire and who study disasters generally and ask them to evaluate the model. They will work on ultimately finding an assessment approach across the WUI so the right resources can be directed to the right places.

It won't necessarily be easy when many new residents of the WUI are from suburban or urban areas and, Carroll points out, may have no clue about fire. They often want the wildness and verdant, natural landscape.

As fire scholar Stephen J. Pyne writes in *Fire: A Brief History*, "Much of the problem … derives not from what people do but from what they elect not to do. They refuse to cut back the scrub, and often promote it. The upshot is an ecological omelette of fuels."

Gifford and Sjoquist recognize the need to educate landowners that they can reduce fire hazard and keep their landscape looking natural.

"One of the biggest barriers is people's conception that a Firewise home means removing all vegetation," says Gifford. "A lot of times Firewise principles mean restoring to an open pine condition, making our forests mimic the open spaces we use to have, instead of thousands of trees per acre like we currently have in a lot of our stands."

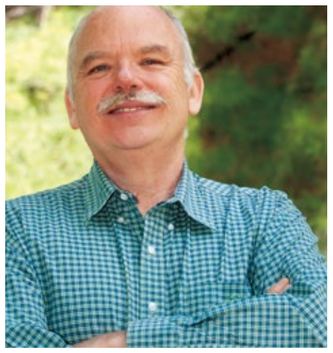
Sjoquist also works closely with small forest landowners to thin trees and prevent disastrous wildfires. Another of WSU Extension's roles, says Gifford, is the science behind healthy forests. "I implement what I learn from them. They're part of my education system to keep me current and make sure the foresters have the best and latest knowledge," he says.

They have many other partners in the work to protect communities and homes from wildfire destruction: Idaho and Oregon extensions, conservation districts, fire districts, the U.S. Forest Service, and the forest industry.

Often, though, it comes down to communities themselves.

"We're not interested in telling a community what to do, but rather figuring out ways for communities to have more agency for themselves," says Carroll. "I think there's a sweet spot between the possession of scientific, technical knowledge—how fires behave—and local and experiential knowledge from people who have lived in a place for a very long time."

How to protect your home from wildfire, a map of Washington wildfires, and a video of the Valley View fire and Firewise community are at wsm.wsu.edu/extra/wildfire.



Linda Kast '75 owns and manages a small forest on Whidbey Island. *Photo Matt Hagen*

Seeing the trees

by Hannelore Sudermann :: At the south end of Whidbey Island, off a tree-lined road, Linda Kast '75 pulls her station wagon up to a gate and jumps out. She opens her hatchback and extracts a thick folder containing maps, a history, and an inventory of her small wooded acreage.

As she leafs through it she explains that she bought this 11-acre forest nine years ago in memory of land her family used to own and regularly visit on Whidbey when she was a child growing up in Seattle.

At the time she bought the property, Kast signed up for a forest stewardship class with Washington State University. Her impetus for taking the nine-week course was to develop a tax plan for the property. But she finished knowing so much more about her trees and how to care for them, it transformed how she looked at not only her property, but the forested lands all over the island, she says. "It's a lot of information. It's very detailed." She learned about the understory, the soils, the history, and the weeds. "It's not for the faint of heart."

Then she bought work boots and a chainsaw and started managing her forest. "Before it was just about the trees and not cutting them," she says. "Now it's about maintaining a healthy system." She and workers she has hired have thinned some of the larger trees like hemlock and the dense sections of Douglas fir. And she planted more trees and native plants.

On this spring day she's meeting with WSU Extension forester Kevin Zobrist to go over her forest management plan and seek his advice on a few things on the property.

Washington State has 21 million acres of forested land. While much of it is commercially owned, about three million acres belong to private landowners—sometimes it's an acre of trees in a back yard, or 500 acres in the hills. Owners include individuals like Kast, as well as churches, camps, and tribes. Most of them are interested in maintaining their wooded areas for privacy, aesthetics, ecosystem health, and to provide habitat for wildlife. While some do harvest their timber for money, it isn't usually their first priority, says Zobrist.

The biggest threat to small-forest ownership is development. Sometimes it's just too expensive for owners to maintain their forests when they are taxed for land at its development rate. But there are alternatives. The Current Use Taxation program allows for the property to be assessed at its use for forestry. But many people don't know about the program, or they don't have the ability to create the forest management plans required, says Zobrist.

And management is important. Existing forests have four phases of development: Open, dense, more complex, and old growth. "It is these older stages that support the greatest wildlife," says Zobrist. They're diverse, robust, and resilient. But in the Northwest, because of logging and fires, we have lost the more complex forests, and are left with relatively young (100 years or less), dense, and unnaturally uniform forests. These have a higher risk for fire and disease, he says.

Watch a video about small forest management at wsm.wsu.edu/extra/small-forest.

Kast's woods were logged in the 1990s. What came back or was replanted included white pines, madronas, hemlock, and Douglas firs. She and Zobrist wade into the timber to inspect the site. As they step through an understory of ferns and salal, Zobrist stops to point out a red huckleberry, a good sign. Then the trees grow denser and the plants on the ground disappear. "You have lost some habitat in here because it's so dense," he tells her. Thinning this area will come later in her plan. Further uphill they find several acres where she has removed some trees to support a more diverse habitat and provide the big trees space to get bigger. Zobrist looks pleased. "As a forester, I come out and this just looks gorgeous," he says.

We see a variety of plants. Zobrist stops to check a young white pine for blister rust, a disease that breaks down the bark and ultimately can kill a tree. The best way to check the disease is to remove and destroy an infected tree, he says.

We reach an area with a small wetland, and a nearby clearing. At one time, Kast thought she would create an arboretum here and introduce some new and interesting trees. But once she started, she realized it didn't fit with what she had. "They were too foreign," she says.

Zobrist tries to discourage the use of nonnative plants. "It's more about stewarding and helping along what would come naturally," he says.

Kast ended up taking the WSU forest stewardship class three times. The second time her goal was to meet other landowners and foresters. "I really liked everyone who is connected with this. They're conscientious, kind, and knowledgeable." And the third was to freshen up her understanding of her forest and bring her stewardship plan up to date so that she can continue to qualify for both tax cuts and Forest Stewardship Council certification.

"I think owning forested land has made me a happier person," says Kast. "I'm looking forward to sharing it with my grandchildren."

Discovery

Reality represented through poetry :: Plate tectonics key to life on Earth? :: Margarita Mendoza de Sugiyama :: The world's most energy efficient office building

wsm.wsu.edu/discovery

WSU athletic director Bill Moos with the new PAC-12 logo. *Photoillustration Shelly Hanks/Staff*

Running with the PAC-12

A conversation with Bill Moos

:: *by Larry Clark '94* ::

THIS SUMMER, Washington State University and the other nine schools in the PAC-10 conference expanded to the PAC-12, welcoming the University of Colorado and the University of Utah. WSU Athletic Director Bill Moos has been part of the changing conference for decades: as a football player at WSU in the PAC-8, as an associate athletic director and athletic director in the PAC-10, and now back at WSU for the PAC-12. The conference also gained the most lucrative television deal in the history of college sports, worth up to $20 million a year for WSU, which splits conference games between ESPN and Fox.

Larry Clark of *Washington State Magazine* sat down with Moos for a discussion on what it means for WSU to be part of the PAC-12 conference, the television deal, and his vision for WSU's athletic programs and facilities.

What does the expansion of the conference mean for WSU and its athletics programs?

I really feel that the conference expansion was a positive move, not just for the conference, but for the member institutions. Colorado and Utah fit the profile of the other ten institutions, in that they are major research institutions with doctorate programs that are really a prerequisite for any institution to be in our conference.

That's why we can hold our heads high and have our chests out, because we truly are both an academic and athletic conference. We've had remarkable accomplishments in both areas.

Speaking of academics, the NCAA academic progress rate (APR) report came out last May, and WSU athletes met or exceeded all the benchmarks.

I think it illustrates the importance we place on the academic component of being a student-athlete at Washington State. Our young people are here to get an education, obtain a degree, and compete in what I believe is the finest conference in the country.

When we see the results in any of our academic areas, such as the APR, it's a source of pride not just for me, but should be for Cougars everywhere.

How will the conference's new television contract help WSU athletics?

I'm very pleased that my peers and I were able to hammer out a revenue-sharing formula that provides equal shares of that television money to all 12 institutions. That's extremely important for us here at Washington State as we'll be able to see our budget grow and hopefully we can compete better with the 11 other schools.

I also want to emphasize the value of the [national] exposure. Literally every football and men's basketball game will be televised live, and for Washington State, it's very important to be seen nationwide to showcase our wonderful university. For those prospective student-athletes to be watching our players, our teams, our campus, you can't really put a price tag on that.

When it's all said and done that might be the biggest boost that Cougar athletics has ever had.

We will invest a lot of the resources into facilities. We're lagging way behind in that area, and facilities are the primary focus of today's young recruits. We've got some catching up to do there.

Upon my arrival I wanted to address the proposed stadium expansion and also prioritize the need for a football operations building to house our football program, feeling that was more important than the renovation and expansion of Martin Stadium.

As it turned out, it made sense to do both projects at the same time and really make them fold into one building.

We have a great many investors in the Martin Stadium project who were hanging tight to see where we were going to go with this. We wanted to make sure they got what they had been promised, but in a different location as we changed the stadium plan from the north side to the south side.

What's the proposed timeline for the facilities expansion?

We've moved ahead quite quickly, having visited six different campuses to look at similar facilities. The design team took over 6,000 photographs and volumes of notes, and we were able to sit down and cherry pick the best features of each of those facilities. I like that it will look like one complete building and complement the existing facility, and I think aesthetically blends in with the rest of campus.

Hopefully we can get started immediately after the last game of the 2011 season, and have fans in the new seats and new suites for the 2012 season, which by coincidence is the 40th anniversary of Martin Stadium.

We want to take advantage of construction costs now, and again we have recruiting classes coming in to see what we're all about. As soon as we have shovels in the ground and steel going up, they'll know that we mean business when we talk about improving our facilities.

How do you feel about the PAC-12's structure?

I like the way the conference is divided. The NCAA allows a conference that has 12 or more institutions to conduct a conference championship game, which will be very exciting and another revenue stream for all 12 of the schools.

I was adamant in protecting the Northwest rivalries. We've been playing each other for over a hundred years and we were able to assure that would continue. Then we added Stanford and Cal to the four Northwest schools. That gives us a good, competitive division that's easily accessible to the fans and should provide a lot of fun.

What's your vision for Cougar athletics over the next two or three years?

We'll see far more competitive sports programs. We'll be solvent and have reserves in place so that we can create the stability necessary so we can be successful.

I've been known in my career as an athletic director who puts a lot of focus on facilities and marketing. When those are clicking just right, the fundraising improves, morale improves, attendance improves, and our ability to serve as ambassadors for the university improves as well. «

See drawings for proposed new football facilities at wsm.wsu.edu/extra/football2011.

Find more pumpkin recipes (and share your own) at wsm.wsu.edu/extra/pumpkin.

Pumpkins

IT'S A RARE FRUIT that can fit in the palm of your hand or grace your table with colorful aplomb and also grow to the size of a small car. But such is the pumpkin. Our long Northwest days are a dream for growing the embodiment of Americana and Halloween.

Evoking American farm life and family outings in the crisp fall air, pumpkins are among the most compelling tools farmers have to lure their urban customers into the countryside. "It has become quite a draw," says Bob Hulbert, whose Dugualla Bay Farms is a short drive north of Oak Harbor. "In the last two years I've had more business in October than I did in June with strawberries."

A member of the family *Cucurbitaceae*, the pumpkin has some interesting relatives: the cucumber, the watermelon, and the loofa among them. According to WSU vegetable specialist Carol Miles, there are wild cucurbits distributed around the world, but the pumpkin itself is native to the Americas.

Some of the oldest evidence of pumpkin consumption has been found in archaeological digs in the southwest and Mexico dating to 5000 B.C. and earlier. The gourd has spent some time in Europe, where it both worked its way into cuisines there and earned its name, derived from the ancient Greek word for melon: *pepon*. Still in many ways, it's particularly American in origin and cultural significance. Nathaniel Hawthorne's Feathertop, the title character of a short story, was a bewitched scarecrow with a "withered and somewhat shrivelled pumpkin" for a head.

Over a season of up to 150 days, the vigorous pumpkin plants tangle out their long prickly vines as far as 30 feet. They send out secondary roots and spread broad leaves, part of nature's design to augment the plant's ability to produce and sustain its fruit, says Miles.

This fall, in addition to riding the hay wagon and wandering the corn maze, people can visit Hulbert's six acres of pumpkins with wheelbarrows and handpick their specimens to take home. It's a fairly easy crop to grow, says Hulbert. Disease and insects aren't major issues. The scariest question is will they turn orange in time for harvest. "Out here on Whidbey Island with our cool sea breezes, we sometimes don't get the heat units required to get them to turn," he says. This year, because of the cool spring, he planted several smaller varieties that turn orange sooner. He still has his big Fat Jacks, he says, but people will also see some other varieties including the rouge, the stonewall, the wee-be-little, and cotton candy (which turn white).

A Pumpkin Land visitor at Beck's Harvest House in Green Bluff. *Photo Tim Bresnahan*

The farms on Green Bluff, the little agricultural plateau northeast of Spokane, draw thousands during the fall harvest season, which starts the last two weeks of September and runs through Halloween. Todd Beck '96, a second-generation Green Bluff farmer, runs Harvest House. One of the main attractions, besides the apples from their 40-acre farm, is the Becks' Pumpkin Land, a space filled nightly with freshly picked pumpkins delivered from Sunny Farms in Othello, Washington.

Years ago, Beck did try growing pumpkins on-site at the farm, but quickly discovered that "pumpkin fields are prickly, thorny, and dirty." Not ideal for five-year-olds who tend to grab leaves and vines, he says.

While Pumpkin Land has "a few Cinderellas and a few ghost pumpkins," what most people still want is that classic Jack-o-Lantern, says Beck. "And the bigger, the better." They usually weigh between 15 and 40 pounds, and most people don't buy just one, he says, "They get three, and four, and five."

People may come for the pumpkins, but they eagerly cue up for the Beck family's pumpkin doughnuts. Although Beck will allow that the fried cake treats contain pumpkin and cinnamon, the rest "is a secret. I won't give that out." And on busy days, he has to limit his sales to one dozen per customer.

Most of the field pumpkins grown for Halloween are great for carving, but not for eating. To make the large decorative varieties, pumpkins are crossed with certain large squash like the hubbard (*Curcubita maxima*) to enhance the size. When it comes to this class of pumpkin, the key thing it's bred for is the handle, or stem, says vegetable specialist Miles. "It has to stay on. It has to be a certain length," she says.

"But if you look at a seed catalog, you see there are so many different and interesting pumpkins out there, many of them edible," she says as she pulls out her Johnny's Selected Seeds catalog and starts turning the pages. "You've got all these shapes and sizes." She lingers over a golden orange variety, and then points to another that's a deep burnt orange. "Here's the Cinderella," she says. It's squat and round like the drawing in the fairy tale. Then she flips the page. "These are real popular, the warties." And then there are the ghosts, which are white, and the Long Island cheese—which looks like a wheel of cheese.

If you are going to go to the trouble of growing your own pumpkin, "you might as well be able to eat it," says Miles. She likes the Jack-be-Littles (*Cucurbita pepo*), which people often use as decoration. "I also grow a little winter squash you can eat," she says. They're sweet dumplings, a classic pumpkin shape, only tiny and with dark green ridges. "I think they're great eating."

In her vegetable trials in Skagit Valley and Central Washington, Miles tries new pumpkin varieties and techniques to help farmers throughout Washington enhance their growing seasons, improve their yields, and look for new qualities. Miles notes that the pumpkin that comes in a can and is mostly destined for pies is actually a type of butternut squash (*Cucurbita moschata*). It's bred so it doesn't have the waist in the middle like the classic butternut, she says. The perfect oblong shape makes it easier to machine peel in processing.

The typical pumpkin grows green and stays green until sometime in late August or early September when it ripens and the rind hardens. If there's a strong frost, the vines will die and if your pumpkin hasn't already cured, it's too late. A pumpkin picked before it has matured and turned color will not ripen. It's best to remove the mature pumpkin from the vine with a sharp knife or pruning shears. An intact stem will help it keep from rotting, says Miles. And you want to get it out of the fields before the temperature is regularly below 40. A strong chill will act like a bruise below the pumpkin's skin. It's often a major cause of post-harvest loss, she says.

Pumpkins can be stored in a dry space like a garage or basement at 50 to 55 degrees. They will stay fresh for several months. ⊗

by Hannelore Sudermann

RECIPES

Ginger-pumpkin muffins

This is a recipe that editor Tim Steury cooked up recently for a WSM staff meeting. The rich tastes of pumpkin, ginger, and molasses are balanced by the delicate texture of the muffin. The walnuts toast up during baking. Serve with coffee or tea.

Ingredients:

1-3/4 cups flour
1 cup pumpkin
1/2 cup brown sugar
1/4 cup molasses
1 egg
Salt
1 tsp. baking soda
1/2 cup butter melted and cooled
1/2 cup finely chopped candied ginger
1 tsp. powdered ginger
1/2 cup chopped walnuts

Directions

Preheat oven to 400° F. Grease or line a 12-cup muffin pan.

Whisk together dry ingredients in a bowl.

In another bowl beat egg lightly and then mix in melted butter and pumpkin.

Stir dry ingredients into wet ingredients until just blended. Fold in ginger and walnuts.

Spoon into muffin pan and bake for 15 minutes. Test with toothpick.

How to process a pie pumpkin

Cut a medium-sized (four-pound) pie pumpkin in half and scrape out the strings and seeds. Remove the stem. Place the pumpkin pieces face down on a cookie sheet, sprinkle with about a quarter cup of water, and cover tightly with foil.

Bake in a preheated 400 degree oven for about an hour or until a paring knife slides easily into the skin. Cool slightly. Scoop cooked pumpkin out of the skin and puree in a blender. Makes 1-1/2 cups.

Get WSU logo pumpkin-carving stencils at wsm.wsu.edu/extra/coug-o-lantern.

Some of the most important things your science teacher taught you are wrong

by Eric Sorensen :: There's the science most of us learned as kids. Then there's the science that scientists actually do.

The K-12 variety is more like a cooking class, but with chemicals, goggles, an occasional Erlenmeyer flask, the unforgettable smell of formaldehyde, and nothing you would want to eat. There, the scientific method is reduced to the formula of a lab report: hypothesize, test, gather data, evaluate, conclude, generally along the lines the teacher told you to expect.

Outside the classroom, science has over the centuries spawned revolutionary advances in knowledge and well-being. But in the classroom it's, what? Predictable. Formulaic. Boring. All of the above.

Judy Morrison, an associate professor in the Department of Teaching and Learning at WSU Tri-Cities, is out to change that.

"One of the things that we as science teachers need to remember is that school science really needs to reflect the scientific endeavor," she says. "There has been a disconnect between those two things. School science is not often how science is actually practiced."

Fittingly, Morrison is standing at the front of a classroom, before a dozen or so school teachers in a professional development workshop, "The Nature of Scientific Inquiry," at WSU Tri-Cities. She prefaces the workshop by noting that she herself spent several years teaching science, only to see how much more needed to be done for students to appreciate the field's whys and wherefores.

"I started realizing that my students didn't understand what was going on and they didn't have a clue," says Morrison, who this year was named the state's Higher Education Science Teacher of the Year. "You teach and teach and teach all this stuff and then they take the test and they might have a right answer, but there isn't complete understanding there."

The misunderstanding starts with our popular notions of what the word "scientist" means, which Morrison gets at by asking the class to describe what comes to mind when they hear it.

Wild hair. Glasses. Lab coat. Standing next to some foaming chemicals. As recently as the '70s, says Morrison, some textbooks portrayed scientists exclusively as white men in lab coats.

Over the next few hours, Morrison starts chipping away at the stereotype and, more dramatically, what he—or she—does. She starts with images of black marks crossing a white space. The workshop participants suggest they look like bird tracks in the sand, or dinosaur tracks, or birds flying.

Morrison now asks the teachers to get "metacognitive," to think about how they thought. If they were thinking literally, says Morrison, all they could really say is the black marks are, well, black marks. Everything else—like the notion that the marks look like bird tracks and may represent some bird behavior—are inferences, she says. That's a good thing, she adds. Inferences are crucial to scientific knowledge.

"Sometimes in science we try to think, 'Oh, just make observations, just stick to the observations,'" she says. "That's really not how science is. We don't stop at observations. It takes that creative endeavor to figure out inferences: What could this be? What might this be?"

Science has other tools, too: building models, drawing analogies, recognizing patterns. These might not be employed in any particular order, and creativity and imagination can come into play at any moment.

Morrison produces a large cylindrical tube, much like an oatmeal container. Four knotted ropes stick out its side. When she pulls out a lower rope, its opposite rope goes in. That seems simple enough; they must be connected. But when she pulls an upper rope, the lower rope across from it goes in.

Morrison hands out a few of the tubes and the room grows animated as different groups start looking for patterns and analogies to draw.

"That one pulls at an angle …"

"Pull that …"

"What's happening? Weird."

"Bottom right… like slip knots."

"What's the experiment called?" someone asks.

Morrison, smelling a ploy, says: "You can't Google it."

Judy Morrison helps teachers and students find science's creative side. *Photo Zach Mazur*

A hypothesis emerges: the four ropes are joined by a knot in the center, so all are connected and prevented from coming out.

"Does that fit the evidence?" Morrison says. "It can't be one piece of rope with four ends."

Morrison's work grows out of an effort launched in the early 1990s to communicate science as it is really done. She has a lot to get across: that science is a way of knowing and constructing reality, but not the only way; that its knowledge is provisional and subject to change under new evidence; that it is rigorous, but also a human affair, subject to human psychology and complications.

With a hypothesis in mind, the teachers in the classroom are reanimated as they start testing the ropes anew. You can hear the gears turning.

"I think there's a little gnome inside, a little leprechaun," one of the men says.

"This is good," says Morrison. "This is where we go back to our characteristics of science. And we talk about the possibility of gnomes. Does this fit into what we know about science? Is this a logical, possible, based-on-what-you-know-about-the-world explanation?"

Try out one of Judy Morrison's science puzzles at wsm.wsu.edu/extra/science-ed.

Using technology to address the challenges of aging

by Tina Hilding :: An increasing number of families know the stress of trying to deal with an elderly parent or spouse who is losing his or her ability to live independently. How can we maintain dignity for those who are having trouble completing daily tasks? How do we keep our elders safe, and who takes care of them?

A WSU research team, led by Diane Cook, Huie-Rogers Chair Professor in the School of Electrical Engineering and Computer Science, and Maureen Schmitter-Edgecombe, professor in the Department of Psychology, will be studying approximately 10-20 residents in Horizon House, a Seattle-based continuing care retirement community, for three years as part of a research pilot project to develop better aging-in-place technologies. Supported by the Washington State Life Sciences Discovery Fund as well as the National Institutes of Health and the National Science Foundation, the project is one of the largest studies conducted on the use of such technologies.

As the U.S. population becomes older, using technology to address the challenges of aging is of increasing interest. Allowing the elderly to stay in their homes not only keeps them happier, but it also saves money. Just keeping someone in their home for an additional few months can save tremendously on assisted living costs that average $70,000 per year, says Schmitter-Edgecombe. "It's a tremendous challenge that is coming," says Aaron Crandall, a postdoctoral research associate in the School of Electrical Engineering and Computer Science who is working on the project.

Residents are eager to participate in research that will support their desire to age in place, says Lauri Warfield-Larson, health services officer at Horizon House.

"As care providers, we need to understand what technology can offer as we serve future consumers who will expect to remain in their homes even with decline," she says.

Currently, there are a few technologies that can help with the challenges of aging, such as wearable buttons that people can activate if they fall.

Regarding clinical treatments for people with mild cognitive problems, "there are no gold standards of care out there," says Schmitter-Edgecombe.

As part of the study, researchers will install between 30 and 40 sensors in each apartment, including motion, door, power metering, and temperature sensors. Motion detectors will make up the majority of the sensors, and will monitor residents' activities as they move from room to room in their apartments. Data will be collected continuously. Half of the study participants have mild cognitive problems and the other half are healthy.

Unlike some home monitoring systems, the research project does not include any cameras or microphones. "Respecting privacy is a primary tenet of the project," says Crandall. "We want to monitor, not watch, residents."

The researchers expect to find patterns in the data that will help them discern and quantify changes in residents' health or possible decline. The sensors will be collecting vast amounts of data throughout the day on each resident, collecting information that will show their daily activities, such as brushing their teeth or cooking dinner. By having good information on these important activities that make it possible for people to live independently, the researchers intend to help caregivers better quantify and discern any changes that might indicate that people are losing their ability to function on their own. They will be comparing the information collected from the sensors with the typical medical assessments that are done to assess declines. The researchers also plan to develop computerized prompts for residents, reminding them of important activities that could help them to live in their homes longer.

"We hope to automatically detect signs of decline via the computer so that care providers will better be able to know the capabilities of their patients," said Crandall.

The researchers are hoping that the initial pilot project at Horizon House leads to a larger, more comprehensive study, which would follow a larger number of elderly residents for a longer period of time.

Cross-cultural pen pals

by Angela Sams '11 :: One morning this spring a group of WSU students from Jeff Petersen's Communication Studies 321 class fills half of a small lecture hall at Spokane's Riverpoint campus. They have traveled here from Pullman to meet their pen pals, 5th through 8th graders from the Nespelem Elementary School on the Colville Reservation in north-central Washington. Though they have been communicating with the grade-schoolers by letters throughout the semester, they are meeting for the first time to visit, "play" with science, and talk about going to college.

The Center for Civic Engagement at WSU started the pen pal project last fall. As a part of its mission, the CCE encourages WSU students to extend themselves beyond campus and engage with the community. The Nespelem students, who have a statistically high drop-out rate of about 50 percent for eighth-graders, might benefit from having one-to-one contact with college students, says Vernette Doty, academic programs coordinator in the CCE at WSU.

Nationwide, the fields of science, technology, engineering, and math have a small percentage of minorities. By making "math,

Coordinates

:: Washington wildfires
:: Washington wineries
:: Enoch Bryan reports from London

wsm.wsu.edu/coordinates

science, and learning fun and interesting," and creating an opportunity for the Nespelem students to interact with college-aged students over these subjects, the younger students are provided "role models for why [they] want to finish school and maybe go on to college," says Doty.

Kathleen Parker, of the USDA Agricultural Research Service, has been bringing scientists to Nespelem for the past five years to demonstrate science experiments with the kids. Children should be learning science at an early age, she says. That is why she helped develop the pen pal project, which came out of a brainstorming event with Doty, Petersen, and Nespelem teacher Sheri Edwards. "This is a really great moment," says Parker of the day in Spokane.

Once the introductions are complete, Ali Smith, a senior majoring in sports management, sits with Mysti Dick, a Nespelem 6th grader, and Wayne Richardson, a Nespelem 5th grader, for a slice of pizza. The letters between Smith and the students covered topics like their daily lives and their favorite things. A few letters in, it became evident that Smith and Dick shared a love of sports. Throughout the semester the communication between all the pen pal pairs was monitored by teachers on both ends. Ali sees the letters as more than just a class assignment, however. "Most people wouldn't have kept up on it," she says. "But I would have."

Ali Smith ***(left)*** and her pen pal Mysti Dick dive into a science exercise at WSU Spokane. *Photo Robert Hubner.*

Mysti has been looking forward to meeting her pen pal for weeks. She's also excited to do the science experiments that are planned for later that afternoon. The whole pen pal experience has shown her that she can meet new people.

After lunch the student pairs head off in different directions. Smith and her pals first do science-based activities. In the next room, the group is playing a game to learn each others' names. When they arrive at their third activity, Smith's competitive spirit ensures that she, Dick, and Richardson, are on the move as soon as the treasure hunt begins.

As the day comes to a close and the students regroup in the lecture hall, the closing activity is a surprise planned by the Nespelem students. The children form small groups with their pen pals that slowly morph into one big circle with everyone dancing. The circle dance keeps expanding and expanding until it finally finishes with the students going around the circle and shaking hands and saying goodbye.

Research gone wild: Engineering power in the Pacific Northwest, part II

by Tina Hilding :: In 1946, the Washington State Legislature established Washington State College's Institute of Technology. In a 1986 oral history, Eugene Greenfield, who directed the Institute's Division of Industrial Research starting in 1958, explained that the purpose of the institute was to "find technological means for inducing a larger industrial output in the State of Washington."

"At the end of [World War II], industry was flopped right straight on its back," said Greenfield. "There was nothing doing, and it looked as though it would be many years before industry would be picking up."

The legislature would provide $500,000 a year to fund a division "whose sole purpose would be to improve the industrial character of the state through engineering innovations and research."

As part of the legislation, the Institute of Technology was permitted to take on research contracts from various industries in the state, including forestry, aviation, glass, plastics, and the power industry. It was a unique arrangement set up specifically to help industry.

With the new funding, the university began hiring leading researchers in their fields. The research was young and exciting, remembers Dave Flaherty, who served as an editor and writer for College of Engineering and Architecture publications between 1956 and 1988. Half of the faculty members were hired solely to do research.

"They were there to help industry in the state," says Flaherty, "The state legislature has never been so generous as in that year."

As the research became successful and produced results, the institute was bringing in significant industry contracts, and students benefitted from the opportunity to participate in research.

Greenfield himself was an expert in electrical transmission and conducted research in electrical insulation—a tricky problem as voltages increased. Greenfield also helped the Northwest aluminum industry become pioneer producers of aluminum transmission line and cables, as the need for aluminum to make military planes diminished after World War II.

"It was a time when industry needed more and more electrical power, and the cities needed more and more electrical power," said Greenfield, "and we had to learn how to transmit it overhead, and also how to transmit it underground."

DAM MODELING

One of the best areas to view the frenzied pace of WSC engineering in the 1950s was in the Albrook Hydraulic Laboratory. Demand for electricity was growing rapidly, and power companies and private utilities were looking to dams as power generators.

Washington Water Power came to WSC researchers in 1953 with a problem. They were looking to construct a spillway for a proposed $85 million dam on the Clark Fork River in Montana. Professor Paul Ruff had experience as a dam modeler, and the WWP engineers asked him to construct a miniature flume in the hydraulics lab. At the time, the closest facility for dam modeling was in Minnesota. By December 1954, a miniature of the dam was built in an old WWII-era Quonset hut behind Dana Hall.

A few months later came another request—this time for a model of a dam on the Middle Snake River at Pleasant Valley. The researchers built a model, one-fiftieth the size of a real dam. It stood twelve feet high and 25 feet across.

With no room in the Quonset hut, the model was built outside.

Eventually, the laboratory was literally built around the dam models—as studies were being

While rock hunting across Antarctica last winter, WSU geochemist Jeff Vervoort was captivated by how the landscape revealed dramatic stories of merging glaciers, tortured ice, wind-sculpted snow, and glacial debris. But where he saw a language of science, Kathleen Ryan, an assistant professor of interior design, saw a language of aesthetic elements and principles, of curved lines, shapes, rhythm, and movement. The result was their interdisciplinary, husband-wife exhibit in the spring Academic Showcase: ***Visual Language of Ice and Rock on the Frozen Continent***. They discuss highlights of the presentation in a web exclusive at wsm.wsu.edu/extra/antarctica. *Photo courtesy Jeff Vervoort*

conducted. A frenzied pace continued in the lab through the 1970s as dams around the West and throughout the world were built. Among the dams modeled at Albrook were the Rocky Reach Dam, built for Chelan County Public Utility District (PUD) around 1961 at a scale of 1:75; Priest Rapids, for Grant County PUD; Wells Dam for Douglas County PUD; and Wanapum, built for Grant County PUD on a scale of 1:20. The lab also did models of Snake River dams, including Pleasant Valley, Brownlee, and Oxbow.

The dam models were not only useful to industry, but became one of Pullman's largest tourist attractions, drawing numerous visitors. At one time, there were two models side-by-side, one for a dam in Pakistan and the other on the Snake River.

POWER PROFESSORSHIP

As the 1970s arrived, power engineering and dam building were no longer the most popular kid on the block. The electronics industry was taking off, and there were increasing concerns about environmental issues tied to the dams and energy usage. With less student interest in power engineering, universities began changing their focus to the newest field of microelectronics. WSU's power engineering program was almost lost, says Stephen Muchlinski ('78 BS, EE), smart grid manager with Tacoma Public Utilities.

However, a group of industry people and WSU faculty decided to fund WSU's Power Professorship program with the intent of continuing to train students in electric power.

Along with A.L. Betts, chairman of WSU's School of Electrical Engineering and Computer Science, one of the leaders of the efforts was Wendell Satre, who was chair of Washington Water Power at the time. Glen Hower, emeritus professor in the School of Electrical Engineering and Computer Science, remembers driving around the entire state with Axel Strom to drum up support for the effort. Strom, who was with Grant County PUD and had been a prime mover on building dams on the Columbia, was a great supporter of the power professorship idea, which was unusual in including support from both public and private utilities.

The Power Professorship program led to an endowed chair in power engineering, currently held by Anjan Bose in the School of Electrical Engineering and Computer Science.

As part of the program, an industrial advisory committee works with faculty on curricula and research. Companies support many senior design projects and provide internships for students. The support of the program also allowed the school to establish two annual conferences on protective relays.

"The Power Professorship program is very important to our business," says Paul Wiegand '79, senior vice president of energy operations at Puget Sound Energy. "We're an electric and natural gas utility. It's one of our primary sources of new, young talent in the electrical engineering arena."

When Tacoma Public Utilities director and CEO Gaines graduated with his electrical engineering degree in 1978, the supply of power engineers was barely keeping up with demand. He received nine job offers when he graduated.

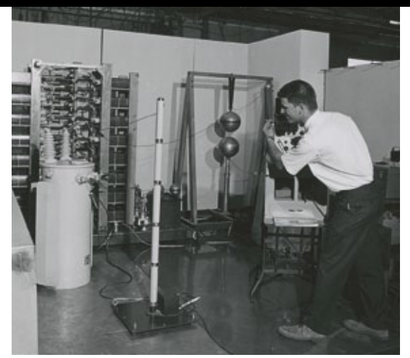
After having participated in an internship with Puget Sound Energy and faced with so many job offers, he decided to return to the power utility for a year or two. He spent the next 27 years there.

"The primary benefit to our industry of the Power Professorship program has been the ongoing supply of high quality engineering undergraduates," he said.

In fact, WSU engineering alumni have gone on to lead several of the largest utilities in the state.

The power program in the 1970s also attracted a young graduate student named Ed Schweitzer to Pullman, remembers Hower. Based on the research that Schweitzer conducted with Professor Al Flechsig, Schweitzer went on to start a company in his basement.

Schweitzer developed a digital protective relay, rather than the electro-mechanical relays that had been traditionally used in the power industry. Schweitzer's company, Schweitzer Engineering Laboratories (SEL), started in 1982 with two employees.



For his master's project, Kirby Holte ('71 PhD) built a high-voltage generator that produced 320,000 volts as part of the electrical engineering department's Spokane Transformer Company project. *Courtesy WSU MASC*

When the company started, says Dave Whitehead '89, vice president of research and development at SEL, utilities would buy Schweitzer's new digital relay simply because it helped them determine quickly where on a transmission line they had a problem. They still kept their old electro-mechanical relays—until they figured out that the digital relay was better.

Today, the company employs 2,500 people. They have offices in 16 countries and their products are in 140 countries. Every utility in North America uses SEL products. «

Next issue: *New Problems and the Smart Grid*

Wendell Berry comes to Washington

Poet and author Wendell Berry visited Skagit Valley in May at the invitation of Washington State University students and faculty. He spent the day touring the WSU research and extension center and exploring a farm. He also visited with area farmers including Tom and Cheryl Thornton, left, and Anne Schwartz '78, right. *Staff photo*

Soil scientist John Reganold contemplates soil layers revealed in a road cut near St. John. *Photo Jim Richardson*

A Fine Thin Skin

wind, water, volcanoes, *and* ice

:: *by Tim Steury* ::

“To be a successful farmer, one must first know the nature of the soil.” —Xenophon, Oeconomicus (The Economist), 400 B.C.

SOMETIMES IN LATE SPRING and late summer, when the fields of eastern Washington have been tilled for spring planting or recently harvested, a wind will build out of the west, gathering the loose loess soil of the dry fields, lifting thousands of tons of it into an ominous cloud that shrouds the region in a murk. The dust that grates in the eyes and leaves a dirty skiff on everything is a lesson in both geology and agronomy.

THE BIG PICTURE

The soils of eastern and western Washington, different as they seem and are, have one thing in common, as do most. They come, either by water or wind, primarily from elsewhere.

Within the geologic timescale, most soils are very young. Within a human timescale, they are ancient. They also form a minute part of the earth in general, a fine thin skin.

University of Washington geologist David Montgomery, in his recent book *Dirt: The Erosion of Civilizations*, describes soil as the “frontier between geology and biology.” Stressing how thin that frontier is, he compares it to human skin. Whereas human skin, at less than a tenth of an inch thick, represents a little less than a thousandth of the height of a person, soil accounts for barely one ten-millionth of Earth’s 6,380 kilometer radius.

East of the Cascades, the loess soils of the Columbia Plateau and the Palouse, some of the deepest soils of Washington, are the result of the return of windblown silts, says Bruce Frazier, recounting the major geological events that created Washington’s diverse soils. Frazier, a soil scientist, recently retired from WSU where he spent much of his career mapping Washington soils.

Southwest Washington is quite different, Frazier continues. Sedimentary materials interspersed with old basalt flows support mountain forests. Chehalis has a coal mine, he notes, highlighting the region’s much different geology.

ZACH MAZUR

Soil scientists Craig Cogger ***(above left)*** and Doug Collins present the result of their experiments with organic no-till at Puyallup Research and Extension Center, soil rich in organic matter and microbial life. ***Opposite:*** Alan Busacca has taken his fascination with terroir to its logical and delicious conclusion, joining winemaker Robert Smasne '99 to produce wines from Syrah grapes with identical techniques from three different vineyards..

Much of the northeast soil is volcanic, the ash blown, again by prevailing winds, from the volcanoes of the Cascades, St. Helens, Baker, Glacier Peak.

Northwestern Washington is dominated by glaciation. The urban corridor strung together today by I-5 is primarily glacial till, materials scoured and absorbed by glaciers, then deposited at the end of their travels when they melted.

Craig Cogger, a soil scientist at Puyallup, continues the West-side narrative. Glaciers extended as far south as the middle of Thurston County, he says. When they retreated, they left behind a variety of soils. The glacial till soils are okay for agriculture, he says. But they have limitations. Their texture is coarse, so they won't hold water.

Whereas glaciers played a dominant role in the nature of Puget Sound area soils, there is also a marvelous diversity. Past eruptions of Mount St. Helens and Mount Rainier loosed huge mudflows, says Cogger, resulting in heavy wet soils interspersed with rocks—not suitable for row crops, but great for pasture and dairy. To the north, in Whatcom County, windblown silts, similar to the eastern loess, create fertile farmland. To the south of Olympia are older clay soils.

The best agricultural soils of the Puget Sound region are in the alluvial river valleys, which collect the sediments from the erosion of the surrounding landscape and the Cascades. "When you combine the soil with the climate," says Cogger, "you have some of the best farmland in the world.

"The problem," he continues, "is we've paved it over."

In geologic terms, those soils have been around for barely a whisper. The soils in the glaciated area are barely 15,000 years old. The soils of the alluvial valleys are just a few thousand.

Considering that European settlement came a mere geological yesterday, we've taken only brief agricultural advantage of this resource. Skagit Valley is an exception. Much rich farmland remains, and farmers seem determined to keep it. After it lost the Kent valley to development, says Cogger, King County "got fairly aggressive about farmland preservation. So Snoqualmie Valley farmland seems to be fairly well protected. It floods every winter, so that keeps development out."

Pierce County, unfortunately, has made little attempt to preserve its soil and farmland, says Cogger. "In the 27 years I've been here, I have seen the valley paved over. There's no will to preserve farmland."

TERROIR: NOT JUST FOR WINE

Alan Busacca gave up his academic career as a soil scientist several years ago to help people grow wine grapes, one of the latest and most lucrative manifestations of Washington's agricultural geography.

Within the soil cognoscenti, Busacca is perhaps best known for continuing J Harlen Bretz's solution to the channeled scablands puzzle. It was Bretz who first understood that the strange Eastern Washington landscape known as the scablands was the result of an unfathomably enormous flood, or series of floods, toward the end of the last ice age. Building on the work of Bretz and others, Busacca gradually established that the upper layer of loess that forms the Palouse hills is the indirect result of those floods. After the floods scoured the existing loess that once layered the scablands, the silt settled out to the south, then was blown back up by the prevailing winds. And beneath that surface layer? More loess, more ancient soil ("paleosols" in the nomenclature), the results of two million years of prevailing winds.

Busacca started out in geology, giving him a very fundamental understanding of soil formation, which comes from a combination of five rudimentary factors: parent material, climate, topography, time, and microorganisms.

Parent material, the beginning of soil, is created from organic material or from bedrock through weathering, which happens through various physical and chemical reactions. The rate of soil formation over time is determined by climate.

Busacca started working with grape growers in the mid-1990s, drawing on his understanding of soil formation and climate, which together determine what is understood as a site's *terroir*, the personality of the site, if you will, the effect on the grapes determined by the same factors as soil formation: parent material, climate, time, topography, and microorganisms.

Since leaving WSU to devote himself full-time to consulting and viticulture, Busacca has taken his fascination with terroir to its conclusion. He and winemaker Robert Smasne '99 have developed a label of "terroir expressive" wine, Alma Terra. Using identical technique, they use syrah grapes from three very different vineyards to make three wines that express the terroir of their respective sites.

The soils of the Minick Vineyard in the Rattlesnake Hills north of Prosser comprise a little loess over shattered basalt. The resulting wine yields red fruit flavors, a little cedar and spice.

The soils of Coyote Canyon in the Horse Heaven Hills are 4–5 feet of loess over hardpan and basalt. Syrah from this site yields a blueberry flavor with a medium body.

The soil of the Ciel du Cheval vineyard on Red Mountain is windblown sand. Combined with its heat, wind, and drought stress, the site yields tiny berries with thick skins, an inky black juice with pleasing tannins and a blackberry taste.

Terroir might not be as pronounced in wheat or peas as it is in wine grapes, but geography and the resulting soil types work together to give Washington an extraordinarily diverse agriculture and landscape.

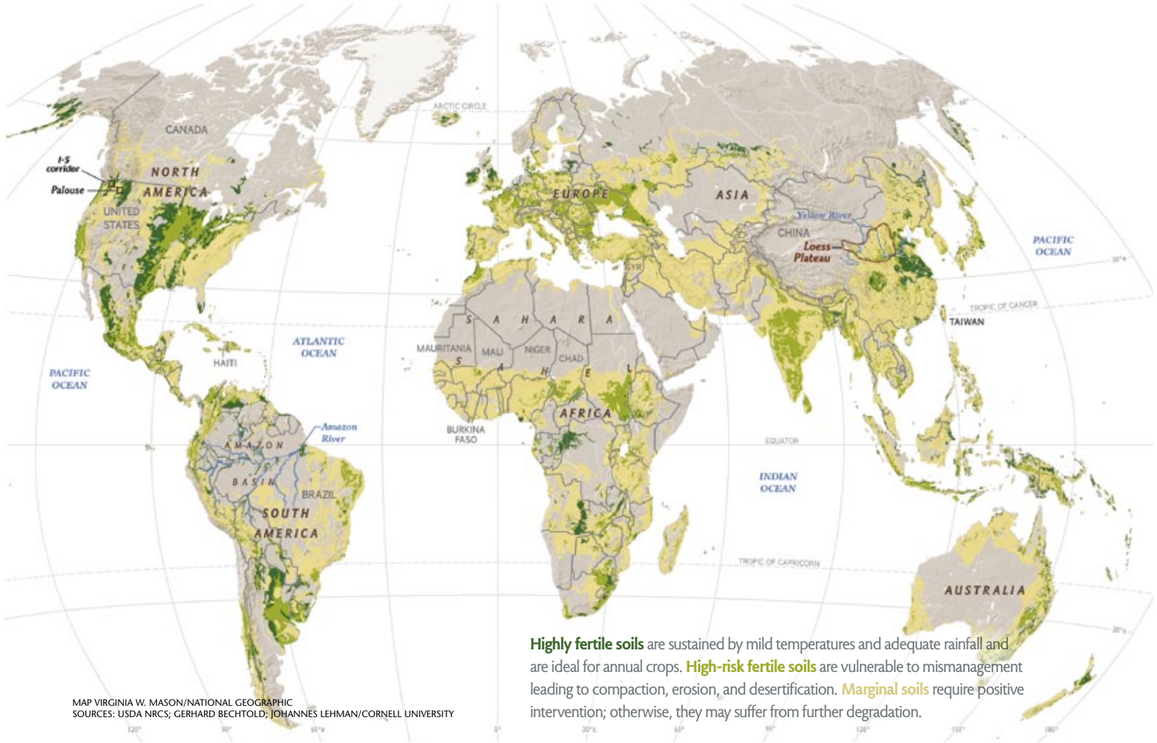
For Busacca, soil geography determines a region's story of settlement and agricultural development. Washington, its agricultural diversity second only to the much larger California, is still discovering the potential and beauty of its geographic diversity, not only for wine grapes, but for the more than 200 other crops it grows.

The sandy plateau of Horse Heaven Hills grows some of the best wine grapes in the country, but also carrots and a wide variety of other crops (see "In Season," WSM Summer 2011). The alluvial soils and silts of the Wenatchee Valley and Yakima Valley have established Washington as the apple capital of the world. Cherries, pears, and other tree fruits love those same soils.

West of the Cascades, the rich alluvial soils that Cogger celebrates have established the region not only for its berries and vegetable crops, but also for its huge seed industry.

And then there's the rich loess, blown in from elsewhere and just as apt to blow away.

ZACH MAZUR



Highly fertile soils are sustained by mild temperatures and adequate rainfall and are ideal for annual crops. **High-risk fertile soils** are vulnerable to mismanagement leading to compaction, erosion, and desertification. **Marginal soils** require positive intervention; otherwise, they may suffer from further degradation.

MAP VIRGINIA W. MASON/NATIONAL GEOGRAPHIC
SOURCES: USDA NRCS; GERHARD BECHTOLD; JOHANNES LEHMAN/CORNELL UNIVERSITY

GOOD DIRT

Karl Hipple, who was formerly Washington's state soil scientist, is cataloging Washington's soils in an online atlas, an ambitious task that one might not ordinarily associate with retirement.

Classification and description of soil seems fascinatingly arcane to a novitiate. Even the general soils map of Washington, compiled by Frazier and Busacca, with its psychedelic mix of colors, only suggests the complexity that lies beneath (see web link opposite page).

For example, Hipple describes the Palouse soil series, which are mollisols, as fine-silty, mixed, superactive, mesic, Pachic Ultic Haploxerolls.

In spite of the dazzling array of soils, however, there is a logic. Perhaps the most useful approach to order is the soil taxonomy used in the United States and some other countries that was developed by the USDA.

Soil taxonomy recognizes 12 orders, explains WSU soil scientist John Reganold in his chapter, "The Nature of Soils," in *Natural Resource Conservation: Management for a Sustainable Future*. "Most soil orders," he writes, "are defined on the basis of having diagnostic horizons, that result from distinctive soil-forming processes and have specific physical and chemical properties."

The orders reflect geography, climate and, to some extent, their use.

Mollisols, for example, are generally associated with prairie and are some of the most productive silts in the world. Approximately 7 percent of the world's soils are mollisols, says Reganold. But nearly 23 percent of U.S. soils are mollisols, reflecting the agricultural advantage the United States enjoys.

"It's not even fair," he says.

Whereas the orders reflect soil quality to an extent—aridisols, for example, form in hot desert areas—the matter of soil health is not that simple.

A good definition of "soil quality" or "soil health" is tough to pin down. But all definitions include certain things, says USDA soil microbiologist Ann Kennedy: pH, soil structure, permeability, all the nutrients, all the chemicals, cation exchange capacity, and then all the things growing in it, the microbes, springtails, and nematodes.

Even with awareness of the wild diversity of soils, however, one might understandably assume soils on a small scale would generally be homogeneous.

Rather, says soil scientist Doug Collins, they are variable.

Geography dictates variability even within a particular field.

Not only does the definition of "healthy soil" shift from, say, vineyard to wheat field, conditions can be variable across that vineyard or wheat field.

Increasingly, soil scientists and farmers are focusing in more specifically to determine proper agronomic practices that might vary over a field or farm.

Whereas Collins, who is an extension educator for the WSU Small Farms Program, is encouraging small farmers to pay closer attention to their farms' variability, some larger farmers are doing so already with technology.

For example, says Benton and Franklin county extension educator Tim Waters, the agronomist for Mercer Canyons in Horse Heaven Hills pulls a machine across the fields that measures electrical conductivity of the soil. From this, he develops a map relating conductivity to soil fertility, allowing them to apply fertilizer with a variable rate spreader according to need.

ALL ABOUT HUMUS

It is late April and unseasonably cold. We sit on metal chairs in a farm shop west of Dusty, a propane heater roaring in the background, as Michael Stubbs recounts his conversion as a farmer.

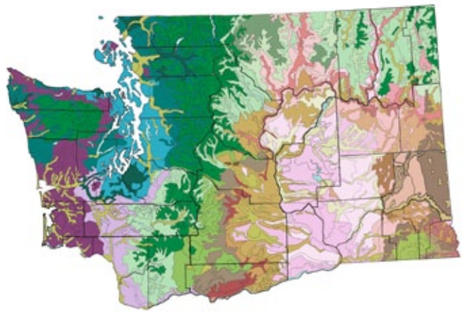
"We're direct seeders," he begins.

Still in a distinct minority, direct seeders minimize soil disturbance by planting directly in the ground without tilling.

Although the pulling equipment has evolved dramatically, from mule to steam engine to crawler to 500-horsepower behemoths with 12 tires that can work a 60-foot swath, conventional tillage is much the same as it was when farmers first worked the prairie and shrub-steppe of eastern Washington in the late 19th century.

Tillage is a hard habit to break. Any farmer will tell you, whether you're trailing a mule team or riding in a climate-controlled cab, there's a great satisfaction in looking behind you and seeing the furrowed soil you've just turned over. And the smell of the freshly tilled field is heavenly. There's also a definite aesthetic appeal and matter of pride attached to a cleanly tilled field.

"I can't talk negatively about someone who likes to look behind and see a plowed field," says Stubbs. "But if you consider all factors of tillage—time, fuel, manpower—those things all have to be taken into account when you feel the need to plow. To get a cleanly tilled field requires many hours, much fuel, equipment."



Explore an interactive map of Washington soils at wsm.wsu.edu/extra/soils.

On the other hand, tillage solves a lot of problems, which vary from site to site.

Weeds are just one of those. The easiest way to get rid of a weed problem, at least temporarily, is to plow it under. Another advantage of tillage is it warms the soil more quickly, assuring earlier seed germination and growth.

Soil scientists and direct-seeder farmers alike are frustrated with the slow acceptance region-wide of direct seeding. But all will admit it's not an easy process. The long-established approach to tillage remains the norm for a reason.

But tillage also destroys the soil structure that attuned farmers and other soil aficionados extol like a wine connoisseur talks about a wine's body and structure.

"Not to cast aspersion," says Stubbs, "but the more tillage you perform, the more you break down that microbial community."

More dramatically, once disrupted, the soil more easily washes or blows away.

In a paper titled "Erosion Impacts on the Palouse Misunderstood," the late University of Idaho soil scientist Roger Veseth reported that since the Palouse was first cultivated in the late 1800s, all of the topsoil has been lost from about 10 percent of the cropland. Another one-quarter to one-third of the topsoil has been lost from another 60 percent of the cropland. Erosion rates of up to 200 tons per acre, or more than an inch of topsoil, have been measured on steep slopes, with a total of up to three feet of topsoil gone from hilltops and ridges.

"When you get rain on the Palouse and you see the Palouse River," says Stubbs, "you see how brown it is, you question sustainability … that soil we'll never get back. It's a very precious resource."

Ann Kennedy has been thinking for much of her career about soil microorganisms, about the extraordinary diversity of microscopic critters that make up a soil ecosystem. But lately, her thoughts have turned more to humus, to carbon, to organic matter.

"We're not seeing the microbes," says Kennedy. "We're not seeing the nutrients stuck on the carbon chains to support plant growth."

And so she has reached a conclusion. No organic matter, no microbes. No microbes? Well, without microbes, it's not soil. It's just a growth medium, something to hold the plants up as they feed on outside inputs.

So suppose you want soil? How do you create more organic matter?

"On the west side, organic matter is not as much of an issue," says Kennedy. "There's more rain, more plant matter produced."

But east of the mountains, where annual precipitation can dip down toward 10-11 inches, it's extremely difficult to produce much organic matter under conventional tillage. Soil science still has plenty of unanswered questions to address. But one answer is obvious, says Kennedy. "The way to increase organic matter: Don't till, produce high-residue crops, leave soil as intact as possible so the roots can act as a slow-release fertilizer."

Or, to put it another way: "No-till is a great way to build organic matter."

On no-till research plots at the Palouse Conservation Field Station, soil organic matter increased from 1.9 percent to 3.6 percent over 20 years. On drier plots near Ritzville, organic matter surpassed native levels, increasing from 0.9 to 2.5 percent. These increases are significant both for demonstrating how slowly soil builds even under optimal treatment and also for no-till's soil-building superiority over conventional methods.

No-till, low-till, direct-seeding are all similar approaches within the broader practice of conservation tillage. No matter what the term

or the degree, however, their aim is to keep the soil as intact as possible and build organic matter.

Unfortunately, it isn't easy.

Even after 15 years of direct-seeding, Stubbs continues to "refine, build, change on that system. The learning curve is pretty steep. Especially under such dry conditions." Stubbs's land gets about 15 inches of rain a year.

"Most years it's closer to 13 or 14 than a low 16. That extra one or two inches makes a tremendous difference."

"With this limited moisture, it is a bumpy ride," he continues. "But we're able to see changes in soil structure, to see porosity increase, the ability of water to infiltrate soil at a given rate, rotation cropping, seeding the fall canola, the tap root that goes down to break up soil, the ability to get soil structure, the top six inches to have it regain what was lost during the tillage period—that's very rewarding."

IT'S COMPLICATED

You don't have to get very far into farming in its broadest sense to start noticing some contradictions. A particularly interesting one is the organic contradiction.

There's a lot to like about raising food organically, no synthetic fertilizers and pesticides, generally a friendlier approach to the soil. Some of the most interesting research, including that by John Reganold and Preston Andrews in horticulture, is showing high nutrient values in organic crops and in some cases yields equivalent to conventional methods.

But attractive as it is, one of organic ag's unfortunate little secrets is that it requires a lot of tillage, at least in field crops. Unless you've sired a dozen kids who love to spend their time pulling weeds, it's hard to control weeds without herbicides or tillage.

On the other hand, no-till or direct seeding requires a good amount of herbicides to control weeds. Even if the herbicides were completely benign, still, any farmer would just as soon give up the expense of applying what often are very expensive chemicals.

Combining no-till and organic right now might be one of the holy grails of production ag.

And it will remain an elusive holy grail for a while longer, because that is a very difficult thing to do. But it doesn't stop Puyallup soil scientists Craig Cogger and Doug Collins from trying. They are working on using cover crops to out-compete the weeds. The basic idea is to direct-seed cover crops to grow over the winter. Then, at an appropriate time, you terminate them without chemicals, either by mowing or otherwise mechanically stopping their growth so they do not compete with the main crop.

THE NEMATODES KNOW

Nematodes are the most abundant multicellular animal on the planet, says Collins.

Unless it has been fumigated or otherwise sterilized, all soil will contain nematodes. And they are amazingly diverse, says Collins. And because of their diverse roles in soil, they are excellent indicators of what's going on in the soil environment.

"The other beautiful thing about nematodes," says Collins, "you can look at them under a microscope and tell what they do by the shape of their face." For example, pathogens have a proboscis that they inject in the root or the epidermal cells of the plant.

ROBERT HUBNER

ZACH MAZUR

ZACH MAZUR

Opposite, from left: USDA soil microbiologist Ann Kennedy initiates students at the Guardian Angel–St. Boniface School in Colton in the wonders of soil microbial diversity. Michael Stubbs '89 and Tami Stubbs '89 practice direct seeding on land west of Dusty, which gets barely 15 inches of rain a year. ***Above:*** Bruce Frazier ***(left)*** spent much of his career mapping the diverse soils of Washington. John Reganold has long studied the effect of various agronomic practices on soil health.

One-third of a cup of soil will contain between 2,000 and 12,000 nematodes. Some nematodes are bacteria feeders, some are fungal feeders, some are predators. Some nematodes eat other nematodes or protozoa, some are omnivores, and some are pathogenic.

"If you have all bacteria-feeding nematodes," says Collins, "it tells you there's been a recent disturbance or a lot of fertility."

C. elegans, a bacterial feeder, can go from egg to egg-laying female in four days.

The presence of predator nematodes, on the other hand, will indicate a more stable soil, as they take 14 months to go from egg to egg laying. Larger bodied nematodes, which correlate with earthworms, also reflect the degree of disturbance, as it takes a long time for them to complete their life cycle.

A disturbed system can still be fertile, says Collins. "From a farmer's point of view..., ultimately it's the soil's function that is important, not necessarily diversity."

As diverse as they are, nematodes make up only a fraction of the microbial life of a healthy soil. In a fascinating paper in *Annals of Arid Zone*, Ann Kennedy and Tami Stubbs '89 (who is married to direct-seeder Michael Stubbs) review what is known and unknown about soil ecology.

"The functions of these diverse communities range from nutrient cycling and residue decomposition, to soil structural component, to plant growth effects," they write. "Soil crusts [created by microorganisms] provide a source of added carbon and nutrients in arid soils as well as protecting the soil from wind and water erosion."

Much of this diverse realm, however, is still beyond our comprehension, simply because of the vast numbers. Kennedy and Stubbs cite one analysis of soil bacterial DNA that indicated the presence of 4,000 genomic types—reflecting a possible 40,000 species.

SOIL AND CIVILIZATION

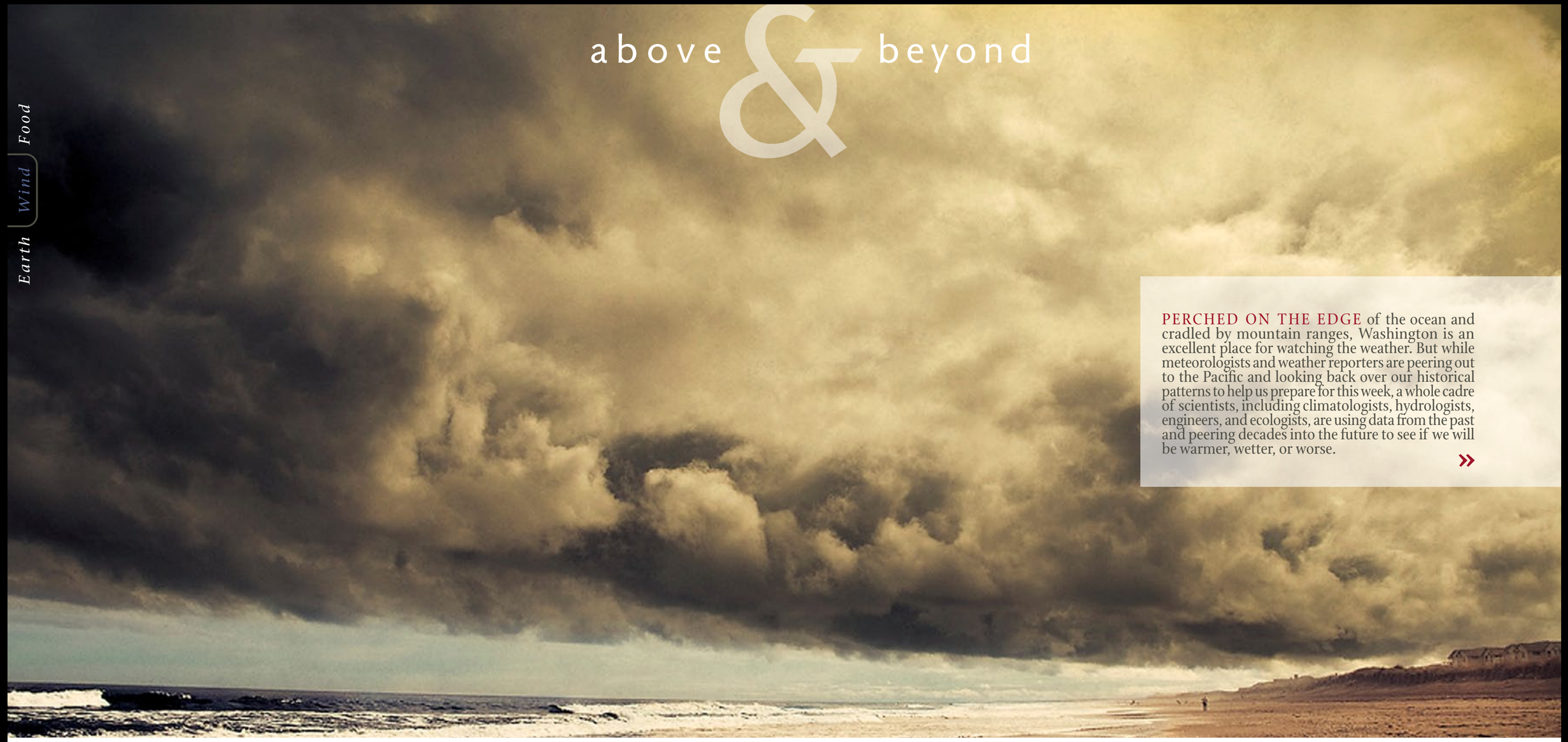
Nematodes and bacteria, of course, are not the only indicators of soil health. The ultimate expression of soil health is our survival. From ancient Greece to Easter Island, as the soil goes, so goes the civilization.

Washington's inordinate share of rich soil and land area, combined with its rich agricultural diversiy and favorable climate, offer a relative guarantee of survival. However, the continuing erosion of the rich loess of eastern Washington and the locking away of equally rich alluvial soils of the west side beneath an impermeable shell should stir unease in anyone interested in the future of eating. Also, a growing dependence by the rest of the world on those relatively few rich agricultural pockets around the world and factors such as political upheaval and climate change preclude complacency.

With Washington's diverse geography, matched by awareness, appropriate agricultural research by a responsive university, and innovative agricultural practices, we can look forward not only to survival, but to continuing to eat and live very well indeed. ⊗

For more on how you contribute daily to soil health and how acidification threatens soil health and productivity, visit wsm.wsu.edu/extra/soil-health.

above & beyond



PERCHED ON THE EDGE of the ocean and cradled by mountain ranges, Washington is an excellent place for watching the weather. But while meteorologists and weather reporters are peering out to the Pacific and looking back over our historical patterns to help us prepare for this week, a whole cadre of scientists, including climatologists, hydrologists, engineers, and ecologists, are using data from the past and peering decades into the future to see if we will be warmer, wetter, or worse.

PACIFIC VIEW AT GRAYS HARBOR *PHOTO NEGA+IVE*

: : *by Hannelore Sudermann* : :

MAJOR NORTHWEST WEATHER EVENTS

JOHN JULEEN/*TECHNICAL WORLD MAGAZINE*

March 1, 1910 Stevens Pass avalanche. The deadliest avalanche in U.S. history was triggered by a thunder clap. It swept a passenger train and mail train down the mountainside. Ninety-six people were killed.

FROZEN SNOQUALMIE FALLS
SNOQUALMIE VALLEY HISTORICAL MUSEUM

Winter 1949/1950 Seattle's coldest winter on record had more than 20 inches of snow and temperatures below freezing for several weeks. Eastern Washington was paralyzed by up to 50 inches of snow.

ON DECEMBER 14, 2006, meteorologist Nick Allard '03 wrapped up his morning shift at the Northwest Cable News station in Seattle. Since a major wind storm was headed for the coast, he checked into a nearby hotel, rested for a few hours, and then headed right back to work.

The severe weather had been building over the Pacific Ocean for a few days. As it closed in on Washington it was growing more intense. A long front reaching all the way up to Vancouver Island ran up against the coast and the Olympic Mountains. Every person has experienced a weather event that sticks with him for the rest of his life. For Allard and thousands of other Washingtonians, this storm would be it.

The previous month had soaked the region with 16 inches of rain and delivered plenty to report about thanks to a series of Pineapple Express storms carrying moisture from near Hawaii. That November had already broken precipitation records, flooded rivers, and caused dangerous mudslides.

Typically, when storms hit our coast they are weakening and falling apart. Some come from the southwest, then suddenly turn north and head for the Gulf of Alaska, danger diverted. But when the December 2006 storm hit land, it came in from almost due west. Low, cold, unstable air moved over Vancouver Island, and around midnight something the experts poetically call "the poisonous tail of the bent-back occlusion" wrapped a tail of high pressure and strong winds down and west over Washington.

Winds ranging from 90 mph on the coast to 70 around Seattle raked over the region, plucking trees and power poles from the sodden ground. More than a million residents lost electricity, several lost their lives, and within days the region was declared in a state of emergency. Later, scientists noted that it was the second worst storm to batter Washington in 50 years (after the devastating Columbus Day Storm in 1962, which took 40 lives).

Allard studied the storm using satellite images, barometric readings, and Doppler radar sent from the station on Camano Island. He and his cohorts along the coast had seen it coming and were more than ready to go out and report on the aftermath. "The big storms are the easy ones," says Allard. "It's the little ones that get you."

With several mountain ranges, the Puget Sound lowlands, Eastern Washington's giant river basin, jet streams, and the Pacific Ocean at our edge, Washington is one of the more challenging places for predicting the weather. "I think it's one of the hardest areas in the country," says Allard. Further east, you have hours and sometimes days of data to review. Here "we get a lot of storms and no one has seen them yet."

Washington has some of the heaviest snowfalls, most catastrophic flooding, and the most intense non-tropical storms in the country. Adding to the unpredictability are the microclimates and surprising weather contrasts. For example, while the Olympic Coast is doused with rain up to 130 inches a year, just a few miles away the town of Sequim averages a mere 15 inches.

On the other hand, everyone knows the Northwest for its temperate climate. The soft rain, the cool summers, the gentle winters. Even Eastern Washington, which has its share of freezes and snows, is still quite sheltered from the coldest Canadian arctic air by the Rocky Mountains. Montana and the Dakotas aren't as lucky. But in all this mildness, there lurks a dark, unpredictable side, says Allard.

The early explorers were the first to note the good and the bad. Captain George Vancouver's gentle spring of 1792 with "the delightful serenity of the weather," contrasts with William Clark's dour winter that was often, "cloudy, dark and disagreeable with some rain all day."

While the Pacific Ocean is really the star force in our weather, the mountain ranges are actors in creating a number of other microclimates, including the Puget Sound convergence zone, where air flow from the Pacific Ocean is divided around the Olympics but then corralled by the Cascades. When the two fronts of the same flow meet over Puget Sound, air rises and forms a band of clouds and precipitation, usually in an area between Seattle and Everett. While it could be sunny in Seattle and Mount Vernon, it may be pouring in Mill Creek.

And while our mountains often protect us from the deepest cold, we have some major vulnerabilities including the Fraser Gap, which channels arctic air down the Fraser River and into Bellingham, and the Columbia River Gorge, which shoots cold air west from Eastern Washington. And sometimes the Canadian Rockies can't hold back the cold arctic surges, which can drop our winter temperatures well below freezing.

It's Brad Colman's job as meteorologist-in-charge of the National Weather Service's Seattle Weather Forecast Office to keep track of all of the weather. He found the Hannukah Eve Storm of 2006 particularly memorable. "A tree fell on my house," he says.

VIDEO FRAME COURTESY KGW

Now with KGW in Portland, meteorologist Nick Allard '03 also tracked storms for King 5 and NWCN in Seattle and for KVEW Tri-Cities/Yakima.

When Colman came to Seattle to work for the National Weather Service 20 years ago, much of the weather data was provided by air traffic radar. It wasn't that helpful, he says, since it was designed to see through clouds and precipitation to capture airplanes. Back then it was even more difficult to watch the storms coming in off the Pacific, or to predict the cold fronts issuing from British Columbia.

Since then more than 120 Doppler stations, as well as other weather measuring equipment, have gone in around Washington and the rest of the country. "It was an amazing improvement," says Colman. Now there are more hits than misses, thanks to a number of tools including satellite images and numerical models that help the scientists look up to 15 days into the future. "That's when we first see a storm," says Colman. "At that point it doesn't exist on the earth. It only exists in our models." The beginnings of our storms can happen on the other side of the Pacific Ocean. "Observations made in China will provide information long before it shows up on our radar," he says.

This September, a new coastal Doppler radar station will be up and running near Copalis Beach. It solves a key problem, that of the existing Camano Island station's limited view over the Olympics. It will let us see below 25,000 feet and better look into approaching storms to determine their intensity.

The new station won't necessarily help predict the storms, since it can only see out a few hundred miles. "But we will see a lot more of what's going on," says Colman. It also provides some lead time with flooding because the station will be able to capture more details about the type and amount of precipitation. "It will improve the quality of our rainfall estimates a great deal," says Colman. That in turn will give the Weather Service, depending on which river systems get the rain, six to 36 hours to prepare and provide flood warnings, helping forecasters like Allard do their jobs. "I'm often more amazed about what we do know is out there than what we don't know," says Colman.

But forecasting in the Northwest has its own set of challenges. "The ocean is a big ocean, and there's not quite as much information available as there is over the continent," says Colman. The jet stream is close to us. And the mountains make things much more complicated. A weather system could come in a broad shield, but when "the terrain just totally breaks it up into bits and pieces," you get pockets of calm,

PHOTO JEFF ENGELHARDT '96

SEATTLE MUNICIPAL ARCHIVES

October 12, 1962 Columbus Day storm. Strongest and widest-spread non-hurricane wind storm for the continental United States. With gusts up to 150 mph in Bellingham and 116 in Tacoma, the storm reached from Northern California to British Columbia.

PETER S. OGDEN ELEMENTARY SCHOOL IN VANCOUVER, BEFORE AND AFTER THE TORNADO. *THE COLUMBIAN*

April 5, 1972 Tornado outbreak. An F3 (severe) tornado touched down in Vancouver, Washington. Two more tornados landed in Eastern Washington—one near Spokane and the other in Stevens County.

WASHINGTON STATE DEPARTMENT OF NATURAL RESOURCES

May 18, 1980 Eruption of Mount St. Helens. Sixty lives were lost from the eruption and ensuing mud flow down the Toutle River. An ash plume covered much of Eastern Washington for several days, preventing cooling at night and warming during the day.

amazing accelerations, and gap winds where airflow is accelerated through mountain passes and places like the Strait of Juan de Fuca. There's something for every season, says Colman. "In our office, we just don't have very many down days."

THE NEW DOPPLER RADAR, which will help us look 250 nautical miles out to sea, is one thing. But for more immediate information, the meterologists make use of WSU's AgWeatherNet, a tool that gives raw data about wind, temperature, and rainfall from 130 sites around the state. The measurements are made from tiny weather stations set up in every county, from Asotin to Whatcom, with many of the sites along the Columbia and Yakima river basins. For good reason. The first stations were installed in 1989 in places like Touchet, Quincy, and Basin City to provide support for tree fruit growers, says Gerrit Hoogenboom, agrometeorologist and director of AgWeatherNet.

While we're talking, Hoogenboom pulls up the AgWeatherNet website. "There are 60 people looking at it right now," he says. It's fairly early in the morning and the fruit trees are blooming. The users are likely checking for frost and wind information, he says.

The stations are networked through radio telemetry to a WSU server and the data are updated every 15 minutes. With so many high value crops like apples, cherries, and pears, a few minutes of warning can offer enough time to turn on irrigation systems or wind machines to protect the fragile buds from frost. In some areas along the Columbia Basin, the number of weather stations is quite concentrated—it's because of the variation in the landscape, says Hoogenboom. Ideally, he adds, there would be one every square mile.

Providing the high quality data has its challenges. WSU must maintain and recalibrate the stations. With so many throughout the state, that takes a lot of work. But the system is useful beyond treefruit needs, notes Hoogenboom. The data can be used by researchers and natural resource workers, it can help farmers make decisions about managing their fields, and teachers can access it for their classes.

"This is not only for agriculture," Hoogenboom says. "It has a whole range of different applications—science in the classroom, water management, energy management." The National Weather Service, particularly the Spokane office, makes frequent use of the stations' data.

ROBERT HUBNER

Agrometeorologist and AgWeatherNet director Gerrit Hoogenboom.

WHILE OUR WEATHER FORECASTERS watch the sky and the sea to help us prepare for the coming week, a whole cadre of experts, including more than a dozen at WSU including engineers, agronomists, and evironmental scientists, are peering ahead up to 100 years to see how the climate in Washington may be changing.

Brian Lamb's expertise in air quality makes it no surprise that his most memorable weather event in Washington was the 1980 eruption of Mount St. Helens. "It's not quite a weather event," admits the director of the WSU Center for Environmental Research, Education, and Outreach. But weather played a part. Winds blowing east carried ash 300 miles to the Palouse where it grew so dark "the street lights went on in Pullman at 3 p.m." While most people remember the blackout and falling ash, that layer of ash cloud prevented the areas it covered from warming during the days and cooling at night.

Because of his expertise with measuring air particulates, Lamb works closely with hydrologists, meteorologists, and atmospheric scientists including Cliff Mass, author of *The Weather of the Pacific Northwest* and professor at the University of Washington, on a wide range of studies involving the weather, climate, and global warming due to human activities. When it comes to expertise in Northwest weather, "he's the guy," says Lamb.

According to Mass, with climate change "things are going to vary a lot around the world." But warming in the Pacific Northwest will probably be slower and less. "Our weather is dominated by the Pacific," he recently told a crowd in Port Townsend. "We are downstream of an area that is warming up more slowly than most places." Between the 1990s and the 2020s, Mass sees no great difference. By the 2050s, he expects average temperatures to rise three to four degrees. By the 2090s, it should be up eight to 10 degrees in places like central Washington. "This is a different world," he said.

The scariest change in Mass's forcasts is in snowpack. "We're not going to have less precipitation," he says. "We're going to have less snow," which means less snow melt for hydropower, consumption, and irrigation.

Not only does Lamb work with Mass and others to look at what the weather is doing (Is there rainfall? Which way and how forcefully is the wind blowing?) he is concerned with the particulates carried or not carried around on Northwest air currents. "You not only have to get the weather right, you have to deal with the sources of pollution," he says. Those include traffic, the oil refineries north of Seattle, and agriculture in Eastern Washington, to name a few. "All those have to be captured at some level of detail in order to get things right," he says.

Lamb is not as concerned with major storm events as the lack of weather—those still periods when air contaminants, particularly ozone, can build up.

The study of air quality in the United States really started back in the 1950s and '60s, when Arie Haagen-Smit, a chemistry professor at Caltech, linked the Los Angeles smog problem to automobile emissions. It was at Caltech in the 1970s that Lamb developed his expertise in measuring air quality. "When I came to WSU, there was already a very active air pollution group," he says. It had started in the late 1940s and early 1950s in response to air pollution associated with aluminum smelters in the Northwest. By the time Lamb arrived, though, the program was focused on field studies in the southern and eastern United States, areas with higher populations and major air quality issues.

Then the Puget Sound region developed a ground-level ozone problem of its own. High levels of the volatile gas are a danger for animals, plants, and humans. The Washington State Department of Ecology asked Lamb and his colleagues to make measurements and later create a modeling study. "The weather here has a huge effect for ozone," says Lamb. "Although things have improved [thanks to air quality standards and improved automobile emissions requirements]," it's still a concern. "We still have ozone-elevated days," he says, especially "when it's hot, with pretty light wind, and lots of sunshine."

But ozone isn't the only issue in the state. Eastern Washington has concerns with particulates from dust and pollutants, and Tacoma is running into problems with very fine particulates from both industry and wood-burning in the atmosphere. "They get very stable inversions in the winter time," says Lamb. That limited air movement, the cold, and the burning of wood stoves make for a high level of these small particles that can aggravate heart and lung diseases.

Lamb is also looking at bigger questions. As part of an EPA-supported project he's one of a team studying how climate will change and how global change affects air quality. "Global change, not just climate, but population growth, urbanization, all the development in China and Asia. Land use changes. When you start thinking about global change, it really gets complicated in a hurry."

MAMMATUS CLOUDS IN THE PALOUSE *PHOTO CHIP PHILLIPS*

WAVES OVER 1,900-FOOT FLOATING BRIDGE
GRANT HALLER/*SEATTLE POST-INTELLIGENCER*

January 1993 Inauguration Day wind storm. The most destructive storm to hit Washington since 1962. The powerful gale knocked down trees, destroyed 79 homes, and knocked out power to 750,000 in the Puget Sound region.

CHRIS ANDERSON/*THE SPOKESMAN-REVIEW*

November 1996 Spokane's ice storm. Freezing rain deposited up to an inch of ice on homes, streets, trees, and cars. Some homes and businesses were without power for two weeks.

SEATTLE MUNICIPAL ARCHIVES

December 14-15, 2006 Hanukkah Eve storm. Hurricane-force gusts, accompanied by heavy rain, blew down trees and knocked out power to 1.8 million customers in the Puget Sound region.

As part of a multi-university effort, Lamb; Claudio Stöckle, chair of WSU Department of Biological Systems Engineering; Chad Kruger, director of the WSU Center for Sustaining Agriculture and Natural Resources; and several other WSU scientists are members of REACCH (Regional Approaches to Climate Change). The $20 million USDA-funded project involves scientists from the University of Idaho, Oregon State, and WSU. Together, they are trying to help farmers adapt their agricultural practices to suit the changing climate and to perhaps practice farming in ways that can reduce greenhouse gas emissions and make more efficient use of fertilizer and fuel.

But first they must understand how the climate is going to change the weather. "Climate change is going to be superimposed on the wide range of changes we normally experience. If you just look back over the last several years, we've had really hard winters three of the last four years," says Lamb. Further back, they were not so hard. That's not climate change, says Lamb. "That kind of variability is natural."

BUT OVER THE LONG TERM we will see warmer temperatures, changes in precipitation patterns, shorter snow seasons, and earlier spring melts. "It will have an impact on ski resorts, ag producers, power generation, and stormwater runoff in urban areas," Lamb says. "In terms of air quality, the modeling we've done so far doesn't show a really large climate effect on air quality in the Northwest." It does in other parts of the country, though. In places with big ozone problems, including the eastern half of the country, there will be more stagnant air episodes. But since our weather is driven by the Pacific Ocean, "here in the Northwest, we should be concerned with what happens in Asia," he says.

As difficult and demanding as it is to peer out over the ocean and up into Canada to predict what the weather is going to be, predicting the changes in climate and figuring out how to prepare is far more challenging.

One recent effort to do so came in 2009 when Claudio Stöckle and a team published *Assessment of Climate Change Impact on Eastern Washington Agriculture*. Assuming irrigation continues, the report found that impact on apples, potatoes, and wheat will be mild for the next two decades, but could cause up to 25 percent in yield losses by the end of the century.

A multitude of climate change projects are now in the hands of WSU scientists. One afternoon this spring Chad Kruger stepped out of a room on the Pullman campus where he had spent the day discussing climate modeling efforts with more than a dozen other scientists. The BioEarth project is mostly about models that will help us look into the next few decades. Led by Jennifer Adam, an assistant professor in WSU's Department of Civil Engineering, the team is using the Pacific Northwest to study how nitrogen, carbon, and water interact to make regional aquatic, terrestrial, and atmospheric models that will help governments and decision makers better manage our agricultural and natural resources.

Because the Northwest is a complex place with extensive agricultural lands, pristine wildlands, and heavily populated urban areas, it is a good location for developing a state-of-science regional modeling system. "We're trying to incorporate human management into the modeling," says Kruger. Projecting 20, 30, even 60 years into the future, the group is defining agro-ecological zones and projecting what these zones might need. In some cases, when the climate gets two to three degrees warmer, seasons will start earlier and water will become scarcer. Issues of diseases, pests, and weeds will change. The modeling will help the scientists and the farmers understand what's coming and how they might adapt their behaviors, says Kruger.

Kahlotus farmer Jim Moore '60 grows wheat in an area of low precipitation. It's an area that studies predict will grow warmer and see less precipitation in the next 20 to 40 years. Moore says the winters now are much milder than when he was a child. Back then they farmed in a way that captured moisture from the heavy snows.

Moore knows that major weather events can stick with you all your life. He remembers the winter of 1949–1950 when it dropped to 20 below and stayed that way for several weeks. The Palouse Falls froze. For the Moore family, the big challenge was getting water from the well to the cistern. The buried pipe froze solid, leaving the family and livestock without water until a neighbor used a big electric welder to heat the pipe with an electric current.

But the cold wasn't the end of it. When a warm spring Chinook wind blew up from the south, it suddenly melted all the snow. With the ground still frozen, there was no place for the water to go. "On the road to Kahlotus, the water was knee-deep," he says. "We couldn't use our car. If we opened the door, the water would pour in."

For Moore, then a teen, the flooding was more fascinating than fearsome. "We had a lot of fun with it as kids. We'd float two-by-fours in the running water." Still, he'd be happy never to see another season like it. "That's the worst winter I can remember," he says.

Though he thinks about the weather every day, Nick Allard carries with him the times he was really awed by Northwest weather. He was a reporter in the Tri-Cities and a severe storm was building. He stepped outside the TV station to see clouds roiling above him. They were working up to what might have become a tornado, he says. He watched as long as he safely could and then ran back inside to view the rest through a video feed from a camera on top of the building. Suddenly there was a microburst, he says. Rain fell, the pressure changed,"and the storm just fell apart."

Not long after, on a drive to Spokane, Allard saw a wall of what looked like smoke rolling across the fields toward his car. For the next frightening 25 minutes he drove in a dust storm, at times barely able to see in front of his car. Then it suddenly stopped. "It was like it never happened."

The most memorable Washington weather WSU soil scientist Craig Cogger ever experienced was in 2009. The temperatures in Western Washington broke all-time record highs by two or three degrees. At the research station in Puyallup, the heat reached 102 degrees. At the airport it peaked at 106, and some areas saw 108. "It was much warmer here than it was over in Eastern Washington," he says.

"I'm not a meteorologist, but I am a weather junkie," Cogger says. He checks his computer several times a day to see the National Weather Service forecasts. "But what I really like is the forecast discussion," he says. There, using scientific terms, the meteorologists talk about why they made the forecasts that they did.

"I've been interested in weather and climate ever since I was a kid," says Cogger. Because of his work with agriculture and his own curiosity, Cogger spends his spare time reading about climate change. "I really wanted to delve into the science deeper," he says. "Not only is the science of climate change robust, but the implications of this are truly scary."

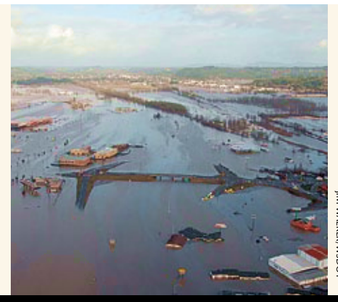
What he learned prompted him as a scientist and extension agent to reach out to his community to explain how and why climate is changing and to urge people to be more concerned and involved. He gives the talk to church congregations, Kiwanis groups, Master Gardeners, and professional audiences.

"In recent years there has been all this hype that it is not as bad as we think," he says. "As a people we're ignoring it." He thinks that's because on a human time scale, the consequences seem a long way in the future. "But geologically, that's a wink of an eye."

ROBERT HUBNER

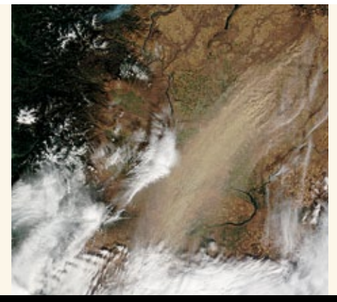
Chad Kruger is director of the WSU Center for Sustaining Agriculture and Natural Resources.

WASHINGTON COAST AT RUBY BEACH *PHOTO BRIAN BURT*



I-5 IN CHEHALIS
JIM WALKER/WSDOT

December 1-4, 2007 Great coastal gale. Three separate storms brought heavy rains and widespread wind gusts of more than 100 mph. The Chehalis River flooded I-5 and washed out fill under the interstate.



THE EARTH OBSERVATORY/NASA

October 4, 2009 Dust storm. Winds gusting more than 40 miles an hour pushed a thick plume of dust across Eastern Washington, closing I-90 near Moses Lake due to zero visibility. The storm caused numerous vehicle accidents.

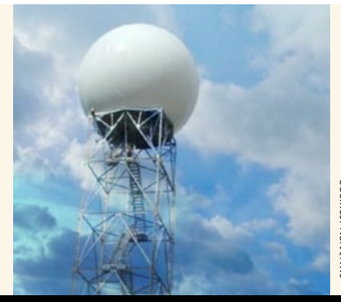


PHOTO ILLUSTRATION COURTESY NOAA/NWS

Washington's newest weather watcher is a coastal Doppler radar station near Copalis Beach in Grays Harbor County.

Read about Washington weather and weather websites at wsm.wsu.edu/extra/weather.

CLAUDIA DEWALD

BILLIONS SERVED

INGENUITY AND TECHNOLOGY have repeatedly saved the day as the world's growing population has come perilously close to famine. But agricultural productivity is now leveling off, and another two billion people should be here by 2050.

:: by Eric Sorensen ::

ORVILLE VOGEL'S STORY is so epic, you could think of it as a founding myth for the research across Washington State University's labs, greenhouses, and fields.

You may know the tale, but it doesn't get old: In the middle of the last century, Vogel developed a short wheat plant that could produce twice the grain of its taller, conventional brethren. Fifteen years later, the Indian government, peering over the brink of a mass famine, ordered 18,000 tons of wheat seed that Norman Borlaug had bred from Vogel's discovery. Combined with irrigation and fertilizers, the dwarf wheat tripled India's production inside a decade. The country, which had been living "ship-to-mouth" on U.S. aid, was feeding itself.

Iterations of the story can include Vogel's humble roots as a Nebraska farm kid. Or Borlaug winning the Nobel Prize for the "Green Revolution" and repeatedly crediting Vogel for his contribution, which Borlaug said, "changed our entire concept of wheat yield potentials."

Vogel himself chalked it up to a good mix of luck, hard work, and zeal. "To plant things and make it grow full blast," he said near the end of his years, when I visited him in Lacey, Washington, for the *Spokesman-Review*. "That's exciting."

Like a full belly, the story is straightforward, satisfying, and true.

It's the sequel that grows complicated. Fertilizers and other farm chemicals central to the Green Revolution are now blamed for a variety of public health and environmental problems. India still has plenty of food, but not everyone gets it. One-third of its people are hungry; half its children are malnourished.

Meanwhile, India's population—and the world's—has more than doubled. By the middle of this century, it is expected to reach 9 billion.

Then, having doubled ten times in 10,000 years, the world's population may actually start to drop. The human population boom will be over.

But for the next four decades, we need to grow more food, and as things stand now, agricultural productivity has leveled off and in some cases started to decline. We need to grow it with more limited resources like land and fossil fuels, and in more environmentally conscious ways, protecting soil, water, public health, and an atmosphere that farm inputs are helping warm.

"The challenge also is not just production," says Oumarou Badini ('94 MS,'97 PhD), a native of Burkina Faso and associate director for West and Central Africa in WSU's International Research and Development office. "It's how you can produce smartly so that you don't deteriorate what you have today and then jeopardize what you have next month. We have to take into account all these elements."

And we need to get food to those who need it, or at least help them get it or grow it.

"Right now, there are 7 billion people in the world," says Ralph Coolman, International Research and Development's associate director for community collaborations. "One billion of those are undernourished or malnourished in some way that has nothing to do with food production. The world produces enough food. But they don't have access to it for a wide variety of reasons."

Badini and Coolman are among scores of WSU staff, faculty, and alumni who, directly or indirectly, are addressing the new millennium's food challenge. The range of their expertise is fitting for such a massive, thorny problem and its many prisms of economic development, education, environmental sustainability, equal rights, technology, philanthropy, culture, and politics.

In fact, there are so many people tackling the problem, from so many directions, that it's sometimes easy to forget they're talking about food, let alone the hopeful, inspiring act of breeding a seed, planting it, and making it grow full blast.

ORVILLE VOGEL COURTESY WSU CAHNRS

IN 1968, Stanford University biologist Paul Ehrlich published his bestseller, *The Population Bomb*, and famously proclaimed, "the battle to feed all of humanity is over." Civilization had lost; widespread famine was imminent.

Four years later, the book was joined by *The Limits to Growth*, which took a similarly dim but more systemic view by weighing not only population but declining resources and the effects of environmental pollution and degradation.

It was a heady time for environmentalism. Andrew Ford, a WSU professor of environmental science, had a front-row seat, earning a PhD under then-Dartmouth College professor and *Limits* co-author Dennis L. Meadows.

To this day, says Ford, the book is the best study of how the exponential growth of people and resource use can overshoot the planet's carrying capacity, leading to a collapse.

As he sees it, "The food problem is embedded in a system that also has a resources problem and an environmental problem."

Here's how the limits shake out. The globe, he explains, has only a certain amount of potentially arable land. Indeed, in the past five decades, arable land has grown by less than one-tenth.

Plant yields, says Ford, are ultimately fixed, as are non-renewable resources like oil and gas. So too is the ability of the environment to absorb, dissipate, or otherwise rend harmless things like reactive nitrogen from heavy fertilization and carbon dioxide from fossil fuel burning.

Combined with a growing population, he says, "we're on a path toward an overshoot of our limits and a difficult collapse that we wouldn't like."

Ford compares the situation to the French story of a pond with a single lily plant that doubles in size each day. Unchecked, it would cover the pond in 30 days, choking off the pond's other life forms. For a long time, the plant seems small; people decide not to take action until it covers half the pond. But that moment doesn't come until the 29th day, leaving only one day to save the pond. And if the pond watchers decide to double the size of the pond, that only gives them one more day to solve the problem.

"The lesson of exponential growth," says Ford, "is it appears like you have huge resources forever, until you get one doubling time away from the limit. And if that doubling time is 20 years, pow, you've got two decades to solve the problem."

The solution, he says, is "don't keep trying to grow… It's to slow down. And the answers are not on the production side—how to produce more food, or how to produce more oil. It's to be more efficient in how we use energy or resources."

But Ford's concern has been voiced before, to where we might be suffering a sort of limits fatigue. Thomas Robert Malthus back in 1798 proclaimed the human population grows faster than its ability to support itself, making famine or disease or some such "misery or vice" inevitable.

The world has certainly seen its share of famines since, but humanity has continued to grow as ingenuity and technology pushed the population limit higher, if only temporarily. New farmlands opened up in America, Argentina, Australia, and elsewhere. Europe embraced New World crops like corn and the potato. Tractors replaced horses; land once used for animal feed could now be used for human food.

Kulvinder Gill, WSU's O.A. Vogel Chair in Wheat Breeding and Genetics, is working to extend farm improvements he saw as a child in India. *Photo Robert Hubner*

Fertilizers improved, starting with bones from old battlefields, then bird droppings from the South American and South African coasts, nitrate mines, and the nitrogen pulled from the air by the Haber-Bosch process. At last, nitrogen fertilizer was so abundant and popular that plants were getting too big and falling down, which is where Vogel and Borlaug came in. And when Ehrlich wrote, "I don't see how India could possibly feed two hundred million more people by 1980," Borlaug saw to it that it did.

This ability of technology to come to the rescue, says Jeffrey LaFrance, a professor in the School of Economic Sciences, is "the technological fix argument against *The Limits to Growth*."

"There can be no doubt that eventually we're going to run out of extractable and usable petroleum," LaFrance says. "We're not making it fast enough not to run out."

But as the cost of one technology rises, it creates a market for a replacement. If gas truly becomes too expensive, says LaFrance, coal can be converted to diesel fuel.

Yet new technologies bring their own problems. Ford notes how the perceived limit of Malthus's day was the rising volume of horse droppings in the streets of London, which were forecasted to reach knee height. Then came the automobile.

"And what are the automobiles doing?" asks Ford. "They are putting into the atmosphere a variety of pollutants. And the one that is most serious in people's mind right now is CO_2. So the cars that 'proved Malthus wrong' are producing the primary greenhouse gas that contributes to climate change, the fundamental environmental challenge of this century. So I would say Malthus was right to warn us."

BACK IN THE '60s, when Kulvinder Gill was growing up on a farm in northern India's state of Punjab, farmers would plant a mix of wheat and chickpea.

"The logic there was if it rains a lot, then you'll harvest wheat and a little bit of chickpea," says Gill. "And if it didn't rain much, you'd harvest more chickpea and less wheat. Then people usually just ground them together and that's what they made roti, or flatbread, with. So the yields were nothing."

Then came fertilizers and new varieties.

"The next thing you know," says Gill, "the yields were so high that no one grew the mixtures anymore."

At the time, Gill and his two brothers would cut half an acre in a day. They used sickles. The heat would approach 100° F. Gill had found his calling.

"I never wanted to work with anything," he says, "but wheat."

It's a fitting remark for the holder of WSU's O.A. Vogel Chair in Wheat Breeding and Genetics. Gill is now focusing genetic research to bring Vogel's brand of success to wheat that can grow in less fertile and more arid conditions.

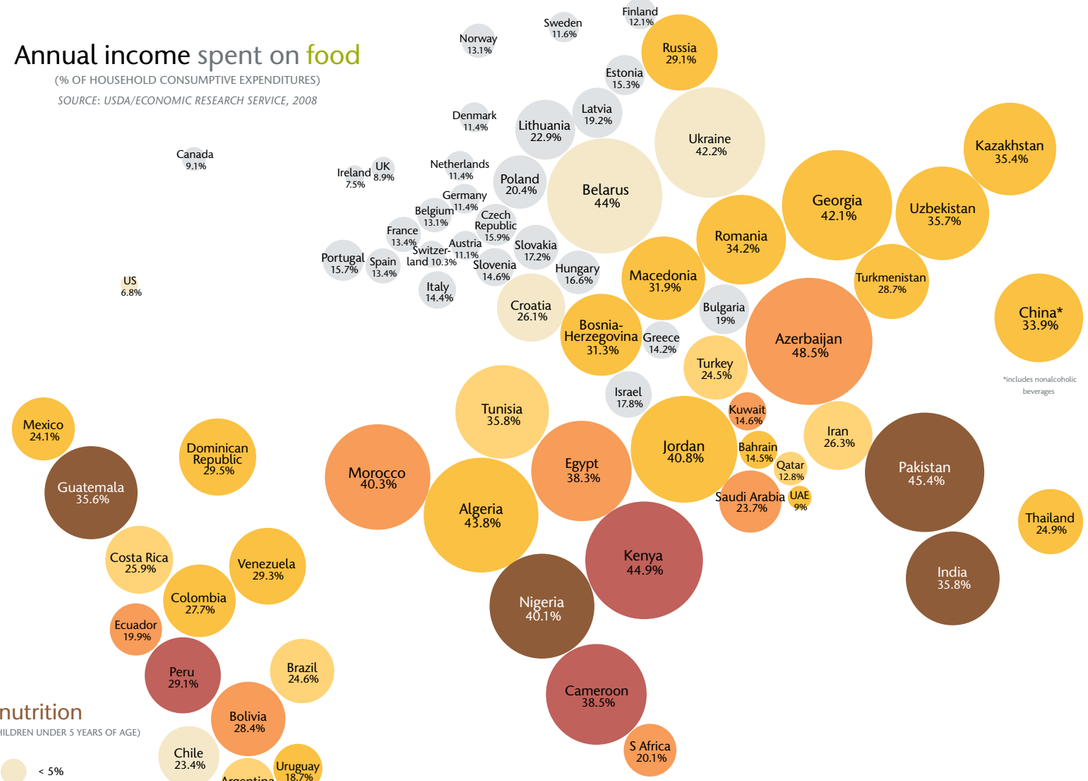
Vogel found his wheat varieties by cross-breeding, a process involving multiple generations and a lot of time. Gill can mutate thousands of plants, using a powerful chemical like ethyl methanesulfonate to change the plant's DNA and subsequent traits. He can then identify an ideal plant to breed into popular varieties.

In a very direct way, he's trying to improve on a shortcoming of the Vogel wheat, a lack of the hormone gibberellin. As a result, says Gill, "everything shrunk." The reduced height kept the plant from falling over, but it also had smaller roots.

Gill would like to find a plant with more roots, firmly anchoring it in the soil and letting it get more moisture. He's also looking for a longer coleoptile, the hollow sheath surrounding the plant's early stem, so it can be planted deeper in drought-prone soils. He has at his disposal a three-year, $1.6 million grant from the National Science Foundation and the Gates Foundation, and while he tells them the work will take more than three years, he's bullish on the technology.

"I think there is a lot of potential with all the research we're doing in genomics to deliver," he says. "And then we may see yet another Green Revolution, where we double the yield again."

A map of the world based on food costs as a percentage of income compared with incidence of juvenile malnutrition. The size of the country represents the percentage spent on food. The darker the color, the higher the rate of malnutrition.



IF THERE WILL TRULY be a second Green Revolution, it will be in the face of pressure to make it green in an environmental sense.

"It's widely acknowledged that there were too many social and environmental problems resulting from the intensive high-input ag approaches often promoted during the Green Revolution," says Jerry Glover ('97 BS Soil Science, '98 BA Philosophy, '01 PhD Soil Science). "USAID and the international research centers now focus much more on soil and water resources and social impacts of agricultural development."

Glover is an agroecologist, adapting broader ecological principles to crop production and focusing on techniques that stand to save and restore degraded and marginal landscapes.

The product of a Colorado farm, he came to his three WSU degrees by way of Skagit Valley Community College, where he studied landscape design and plant science while living in a '54 Chevy camper. There he read a paper by WSU soil scientist and organic farming pioneer John Reganold, who became his doctoral advisor.

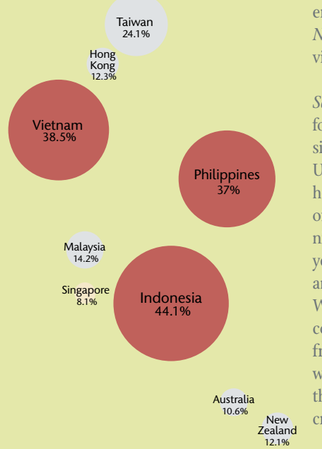
"Agriculture integrates so many of the different elements of being a human: the social, political, economic, our interactions with the natural world, and so on," he says. "It was a fairly short, fast trip from discovering soil science to becoming devoted to agriculture and the implications for humanity."

While at WSU, Glover had a fellowship at The Land Institute, a Salina, Kansas, nonprofit working on perennial crops that could marry stable prairie ecology with the grain yields of annual crops. Glover studied a tall grass meadow that had been mowed for hay for nearly a century. It had no inputs like nitrogen fertilizer. As might be expected, the harvested grassland's soil was healthier than either conventional or organic ground. Moreover, the meadow owner was harvesting more nitrogen in the grass hay than he was from the high-input wheat field where he applied high levels of nitrogen fertilizer to maintain adequate yields. In the grassland, Glover saw "a model for a truly sustainable type of agriculture" and a reaffirmation of The Land Institute's vision.

Glover is now on leave from the institute as an international agriculture research advisor working with USAID. The journal *Nature* has called him one of the "five crop researchers who could change the world." *National Geographic* has called him a visionary "emerging explorer."

Writing last year in the journal *Science*, Glover and Reganold called for a focus on perennial grain research similar to that underway on biofuels. Unlike conventional grains, which have been planted annually for most of agriculture's 10,000 years, perennial grains could be planted every few years, using less fertilizer, herbicide, and fuel, and causing far less erosion. With roots as long as 12 feet, they could build soil, sequester carbon from the atmosphere, find more water, and use more of the nitrates that can pollute drinking water and create marine "dead zones."

The grains, which they predicted could be a reality in 20 years, would be particularly helpful in the world's marginal soils that support half the world's population.



AFTER JAHI CHAPPELL got an undergraduate degree in chemical engineering, he helped make body wash for Procter & Gamble, the world's largest consumer products company. The work didn't quite meet his standard for improving the lives of others.

But he did take to heart the engineer's concept of the "rate-limiting step," the slowest part of a reaction that in turn determines the reaction's overall speed. As he turned his attention to ecology and the challenge of feeding the world, he realized a lot more than food was involved in food security.

"The constriction point is not technical solutions," says Chappell, an assistant professor of environmental science and justice at WSU Vancouver. "It's political feasibility and political will. That's quickly obvious when you look right now. A couple people have responded to the question of, 'How do we feed 9 billion people?' with, 'How do we feed 6 billion people?' Because we have enough food now but we have around a billion people who are malnourished right now. That clearly is not just a problem of supply."

JAHI CHAPPELL BY BRIAN BATES

To be sure, he says, food production in some cases will be important, even paramount.

"But in the majority of cases," he says, "there are a lot of other factors, like how much of the food dollar farmers recover, which would help a lot of farmers in terms of their own food security. And actually a slight majority of the people who are malnourished are farmers or rural inhabitants."

Most of the people in rural sub-Saharan Africa are smallholder farmers. Many lack adequate roads and access to markets.

"If you raise production but don't have infrastructure," says Chappell, "that's not going to help farmers very much, even in a very economic, market-focused way."

Raising the status of women has also been shown to have a huge impact on malnutrition. As their incomes rise, they're more likely than men to spend it on their family than themselves, says Chappell.

"When women have education, have better nutrition, have better political power, they tend to take care of the family better," he says. "So women's education and health is very strongly tied to infant health, and not surprisingly."

An even larger reform would ensure everyone the right to food. In 1966, the United Nations General Assembly adopted the International Covenant on Economic, Social and Cultural Rights. Among those rights: acceptable, accessible, available, and adequate food.

"Some people say it's the most basic right—the right to food," says Chappell. "All other rights, the right to enjoy life, flow from the ability to nourish yourself."

President Bill Clinton signed the covenant but the United States remains among a handful of nations that have failed to ratify it. At the 1996 World Food Summit in Rome, the United States fell short of saying the right to food is an actual right, calling it instead "a goal or aspiration."

Chappell argues that, if only in economic terms, food security is a public good.

"We have less sick days, we're less likely to get ill, there's more productivity, there's all these wonderful things that flow to all of us from being healthy and well fed."

In Belo Horizonte, Brazil's fourth-largest city and the subject of Chappell's University of Michigan dissertation, the government in 1993 made healthy, high-quality food a right of its citizens. It helped farmers get into the city to sell food, rented them spaces in areas of heavy foot traffic, and encouraged them to form cooperatives to share the burden of going to market. The government also subsidized school lunches and meals in designated "Popular Restaurants."

The number of starving children dropped by more than half.

It's a remarkable accomplishment, underscoring a point Chappell made in the online science magazine *Seed* while debating food security with Robert Paarlberg, a political scientist at Wellesley College. Paarlberg argued that the majority of hunger stems from inadequate food production. Chappell said it stems more from poverty and a lack of access to food, for social and economic reasons.

The key issue, Chappell wrote, "is how we choose to approach and engage those we nominally wish to help."

LAST YEAR, the journal *Science* devoted an issue to the "unprecedented challenge" of feeding 9 billion. In one of several pieces, Oxford ecologist Charles Godfray and colleagues cited studies saying world food production needs to increase as much as two-fold by 2050. Many of their recommendations will sound familiar: tackle poverty itself, empower women, stress sustainable systems. They mentioned the promise of genomic research, including the increased sophistication of genetically modified crops, the increased demand that rising standards of living will have, and the need to save the 30 to 40 percent of food lost to waste.

Almost in passing, they noted that the best way to improve food production is "highly site-specific." WSU International Research and Development workers know that about as well as anybody, having worked around the world with some of the poorest farmers.

"I can go into any village that we've worked in a number of years and ask them right off what they'd like, what they need from development," says Director Chris Pannkuk ('92 MS Soils, '94 PhD Soil Physics). "I can guarantee water, fertilizer, and improved seed will be on that list as well as a health clinic and a school and things like that."

Such prescriptions, he says, are the traditional development model for a number of places, and manage to capture "the low-hanging fruit."

"Sometimes it's enough to do that," he says, "but in many cases what you want are tools that are not prescriptive, that the villagers will actually recommend to themselves once they've had a chance to articulate or talk to whoever is going to supply the inputs."

It's a participatory approach, and goes a long way to identify skills, resources, leadership, and potential.

Limits can be just as important a consideration as assets. A subsistence farmer making $2 a day—the norm for the farmers the office works with—can't suddenly invest in expensive seed or a suite of inputs.

"They have very little that they can lose," says Coolman, associate director for community collaborations. "So getting them to try and make new changes, getting them to adopt new technologies, is challenging, because they're living on the edge. They know that what they do provides at least some minimum standard for their family. A change, while it could provide return, also has more risk than with me changing what I do in my garden at home."

Starting in 2009, Colleen Taugher, a project associate in the office, was part of a team that wandered around rural Kazakhstan asking farmers about the issues they faced. An hour from Almaty, the largest city, she found a dairy farmer living off the grid "out in the steppes."

Having no electricity, he had no way of keeping his milk cool before it could be transported to market.

"He was mostly only able to produce for his own family," says Taugher, "and in many cases he was dumping milk on the ground because there was no way to keep it."

The solution: Convert a shipping container into a cold storage unit powered by solar panels. Now the farmer can chill milk immediately and have it picked up every few days by a passing dairy truck.

"He increased his income by $2,000 a month," says Taugher. "That's major."

JIM RICHARDSON

Taugher has seen similar small-scale, appropriate technologies help shepherds irrigate gardens, introducing vegetables into a diet of mostly meat. And when a solar-powered well went in near Taraz, a woman could stop watering 300 sheep by lowering and raising a bucket.

"She was so tired that when you talked to her, she would keep leaning on things," says Taugher. "She was just physically ruined from it."

The international office currently has $30 million in projects, making it one of the more substantial university-based international development operations in the country. But it generally doesn't have funding to return to an area and measure its impact or make refinements. This makes a community's participation, no matter how good the idea, particularly important.

As a Peace Corps worker in Sierra Leone, Pannkuk saw women threshing rice with their feet. So when he saw a bicycle-powered thresher at a Food and Agriculture Organization conference, he got one and brought it to the village.

"You probably should have talked to the women," he was told. He then was made to understand that the rice harvest was a communal experience for them, and while they were threshing, they were also talking with each other while the men looked after the children.

The bicycle-powered thresher, says Pannkuk, disappeared.

More recently, in Afghanistan, Pannkuk was part of a six-month effort to survey farmers and suggest a way for them to come back from a devastating drought. He later recommended planting nurseries and fruit trees.

"They listened to me very nice sitting around this mulberry tree, saying, 'That's a good idea, Mr. Chris, but really what we need are animals. That's the first thing we lost.'"

It's as if Pannkuk was embodying Chappell's remark, that the key food security issue "is how we choose to approach and engage those we nominally wish to help." Pannkuk had found those he wanted to help, and needed to close a last mile that was psychic and cultural, as well as physical.

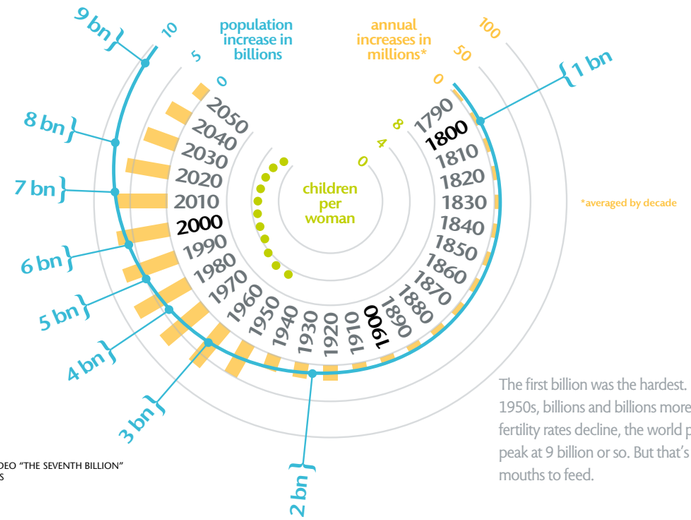
Pannkuk argued to the villagers that most lost their fruit trees and replacing them would benefit the community. After a difficult week of discussion, he caved on the animals, but got the farmers to agree to producing forage, conducting variety trials, artificially inseminating cows, and setting up women's groups formed to make cheese.

"I thought this was the most difficult week after working months and months on this," says Pannkuk. "I told them straight up but they said, 'Oh, but Mr. Chris you were a very good arguer. You argued right down to the last, you know. You're probably very good at buying carpets.'"

Pannkuk's experience is a new version of the Vogel story, writ small enough for a village. A group of people in the developing world, living on the brink of existence, need help. From across the miles, a scientist, brimming with knowledge and technology, visits the problem and helps forge not one solution, but several solutions. ⊗

Read about International Research and Development projects around the world at ip.wsu.edu/ird/projects.

Food challenges vary from place to place, and WSU International Research and Development workers have visited many to help the world's poorest farmers. ***Clockwise, from top left:*** Ralph Coolman, Oumarou Badini, Colleen Taugher, and IRD director Chris Pannkuk. *Photos courtesy of individuals, respectively, except Pannkuk by Robert Hubner.* ***Opposite:*** For Jerry Glover ('01 PhD Soil Science), agriculture's brightest future is below ground in the saved soil and powerful root systems of perennial grains he is helping develop.



STAFF ILLUSTRATION TRANSCRIBED FROM THE VIDEO "THE SEVENTH BILLION" *THE ECONOMIST;* DATA SOURCE: UNITED NATIONS

The first billion was the hardest. But starting in the 1950s, billions and billions more people arrived. As fertility rates decline, the world population could peak at 9 billion or so. But that's 9 billion or so mouths to feed.

Class notes are now online!

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CLASS NOTES

1970s

Art Tasker ('71 Forest Mgmt.) manages the Washington State Department of Natural Resources' operations in the south Puget Sound region. Tasker manages 73 permanent employees and 24 seasonal employees. He has been with the DNR since 1973.

Larry Lewis ('72 Arch.) is an architect and photographer who lives in Visalia, California, where he recently had a show displaying his nature photography. His images portray the landscape of central California and the Sierra Nevada.

Jo Ann Washam ('72 Ed.) was recently inducted into the Pacific Northwest Golf Association Hall of Fame. Washam played on the LPGA Tour from 1973 to 1990, where she won three individual tour titles and two team titles. She currently lives in Olympia and is an LPGA teaching pro at The Home Course in DuPont.

Dick Boysen ('74 MA Child & Family Studies, '75 MA Continuing Ed.) is the executive director of the Spokane Guilds' School and Neuromuscular Center, and was chosen as the 2011 Sacred Heart Children's Hospital Advocate of the Year.

Lindsay Fiker ('75,'77 MEd) has been appointed to the Skagit Valley College Board of Trustees. She is the Burlington Edison School District work-based learning coordinator and has served as the Burlington-Edison career center specialist for the past 15 years.

Bertha Lynn ('77 Comm.) and **Ana Cabrera** ('04 Comm. and Spanish) work as news anchors for Denver's ABC affiliate KMGH 7NEWS. Bertha has worked in the Denver news market for 30 years and currently serves as a trustee for Regis University and is a member of the Denver Art Museum's African American Outreach Task Force.

Roger Woodworth ('78 Wildlife Biology) is the vice president of Avista Corp. as well as chief strategy officer. In 32 years with Avista, Woodworth has not only served as vice president for sustainable energy solutions, but also as vice president of corporate development and operations.

Katherine S. Ankerson ('79 Arch., '94 MS Arch.) has been appointed head of the Department of Interior Architecture and Product Design at Kansas State University. She was the associate dean and professor of interior design in the College of Architecture at the University of Nebraska-Lincoln, and taught at Radford University in Virginia and at WSU. She founded The Ankerson Design Group in 1990.

1980s

Paul Willis ('80 MA Engl., '85 PhD Engl.) was chosen by the Santa Barbara, California City Council to be the Poet Laureate of Santa Barbara until April 2013. Willis is a professor at Westmont College where he has been teaching since 1988. He has been published in over 100 literary journals, and published a book of poetry, *Visiting Home*, which was released in 2008.

Duane Yecha ('80 Industrial Ed., '87 MA Ed. Admin.) is superintendent of schools for the Crook

AMANDA HOWSE

Members of the Girl Power Hour team: Corrie Westmoreland '02, Darcy Camden Werden, Darnell Sue '02, and Danica Westmoreland '03.

Darnell Sue '02

A girl and her power

by Hannelore Sudermann :: This thing called Girl Power is at work well before the scheduled hour of 6 p.m. A peek into Bellevue's Pure Barre gym one evening in May offers a view of more than a half dozen women in dresses and high heels setting up tables, filling swag bags, and arranging food and cocktails for a crowd. In the middle of the whirl is Darnell Sue '02 in a dress of black and hot pink, her signature colors, her hair twisted into a chignon, a notepad under her arm.

This is the set up for Girl Power Hour, a "stylish networking event" held the third Thursday of every month in Seattle and nearly as frequently on the east side of Lake Washington.

The evening's themes are "Fit and Fabulous," hence the location at a women's gym where the workout includes a ballet barre and dance and Pilates techniques. The sponsors are a protein bar created just for women and a plastic surgeon.

Sue, née Westmoreland, graduated in business and went to work at media jobs including at a record company, a television station, and most recently with a communications group that produces *WHERE Magazine* for Seattle. In 2007, in the middle of a very corporate annual meeting, she realized she'd rather be doing just about anything else.

It was one of the classic business events with bad coffee and fluorescent lights, she says. "I just wanted to hide until it was over." Fortunately, she met Samantha Lawton who was having the same experience. The two agreed

there must be a better way to socialize and network. Several months later they held their first event for 100 guests at the Shilshole Bay Beach Club in the Ballard neighborhood of Seattle.

The idea was to provide women a social event in a "stylish, non-threatening environment," says Sue. "Really, it's about building community."

That first Girl Power party was easy, says Sue: "That's because we didn't know what we were doing." But with each new event, they added depth and interest, finding new themes and locations and bringing focus to women's needs and charities, including breast cancer awareness and clothing drives. The themes evolved to include eco-friendly fashion, how to survive (and stay stylish) during a recession, and how to market your brand and your business.

They also turned Girl Power Hour into a club with memberships. GPH members can access special resources on the group's website, attend events at a discount, and have access to member-only nights at boutiques and spas. Eventually Sue bought out her business partner and is now the CEO and the sole paid employee.

In October of 2009, Sue and her team expanded GPH's territory to include Bellevue. While the interest there is as great, the women who come through the door are more established in their careers. "It's a different demographic," says Sue. "They're older and more upwardly mobile."

All the while, Sue has been building her own brand as a "girl about town," a DJ, and a blogger for the *Seattle PI*. The rest of the team is made up of volunteers—friends and family who love the idea of Girl Power Hour and for whom the networking service coordinates well with their own interests and businesses.

That networking skill helped Sue find Darcy Camden-Werden, founder and chief stylist of Styled.Seattle, a few years ago at a Seattle Fashion Week event. They both quickly realized how well their two businesses coordinated. "This is a great platform to network and market my business," says Camden-Werden, as women holding cocktail glasses start filling the room.

"Darnell knows that women are natural networkers," says Camden-Werden. "And with men out of the equation, it's so much easier."

While there have been other similar women's networking efforts in the Seattle area, says Camden-Werden, few are infused with such flair. Darnell is the best at making it happen, she adds. Sue sees it a little differently. "I'm the nuts and bolts person," she says. She does the core work of planning and coordinating the events and offerings, but builds off the ideas of her team as far as location, themes, and sponsors. Other members of Sue's GPH team include her sister Corrie Westmoreland '02, her cousin Danica Westmoreland '03, and other local businesswomen with marketing, advertising, sales, and business backgrounds.

This September, Girl Power Hour celebrates its fourth year of events. The clients have changed some, says Sue. Initially more were self-employed. Now 75 percent have jobs with an employer. And while initially most of the participants were in their 20s, it now seems to have a broad appeal, says Sue. The majority of the members are between 25 and 35, and 20 percent are 40 and older, says Sue.

Last October, Sue left her magazine sales job and devoted herself full-time to developing Girl Power Hour. Now that she's having success in Bellevue and Seattle, she's planning on reaching out to Tacoma for an event or two in the coming year. And as she continues to refine the formula, Sue hopes to take Girl Power Hour to other states.

"I'm proud we've been able to keep people's interest for this long." Yes, a lot of what they offer are the ever-popular shoes, cocktails, and swag, says Sue. "But if we can find a deeper purpose in there, all the better."

A Leonard legacy

by Larry Clark '94 :: Elmer O. Leonard started as a student at Washington State College in 1915. When the call came in 1918, he headed to Europe and the Great War as a soldier. Like a number of other young men, he was killed in combat and never returned to Pullman and the college.

His nephew and namesake Elmer F. Leonard was born a year later. He followed in his uncle's footsteps to Pullman, enrolling at WSC in 1939, joining the Army and serving in World War II from 1942 to 1946, and eventually graduating from WSC in 1949.

Ever since the first two Elmer Leonards, WSU has been a part of the Leonard family and a source of many memories, including Elmer F.'s years as a firefighter on campus.

"I was in the fire station for four years. In fact, I became the chief at the fire station at one time," he says.

The old fire station, on the present site of Daggy Hall near the engineering buildings, housed WSC's all-student firefighters, ten at the time Leonard was part of the team.

County School Board in central Oregon. He has worked as superintendent for the Winston-Dillard School District and the Reedsport School District in Oregon, as well as high school principal in Boardman, Oregon.

Dick Hanlin ('81 Comm.) is chief professional officer of the Boys and Girls Clubs of Spokane County. Hanlin has more than 25 years of executive leadership experience in the Boys and Girls Club. In his new position, he intends to promote sustainability, maintain good facilities, and expand the club to include more locations.

Terry Kelly ('81 Account.), a tax attorney with over 25 years of legal experience, recently joined Lee & Hayes after working for many years at the Lukins & Annis law firm. In addition to his legal work, Kelly has served on the boards of directors of Holy Family Foundation, Spokane Country Club, and Gonzaga Preparatory School. Kelly played on the varsity basketball team at WSU from 1977 to 1981.

Scott MacDonald ('82 Broad./Theater) plays the part of Blackie in the recently released film *Water for Elephants*. MacDonald has worked in television and films since the late 1980s, and he has been in many commercials, TV episodes, and movies, including *Star Trek* and the movie *Jarhead*.

Craig Ehlo '83 has been hired as assistant coach for the men's basketball team at Eastern Washington University. After 14 years as a player in the NBA, he spent three seasons as a high school basketball head coach and six years working with Nike Skills Academy. Ehlo has worked as a television analyst, doing broadcast for WSU, Gonzaga, and the Seattle SuperSonics.

Sam Regalado ('83 MA Hist., '87 PhD Hist.) received the California State University Stanislaus Outstanding Research, Scholarship, and Creative Activity Professor Award for 2010-11. He has been working at California State University since 1987 and has written a book called *Viva Baseball!*.

Jon Maesner ('84 Pharm.) is CIGNA's chief pharmacy officer. In his new position, he will lead the company's coordinated approach to integrating medication therapy with its medical, health, and wellness programs to improve health outcomes and lower overall health care and disability costs. He has held various positions at Prudential HealthCare, Genentech, and Group Health Cooperative, and was an adjunct faculty member in the School of Pharmacy at the University of Washington.

Ruth Medsker ('84 Ed.) has been appointed the principal of West Seattle High School, where she served as interim principal. She has been education director for Seattle Public Schools and assistant principal and principal at Mercer Middle School. She was given the Alliance for Education's Thomas B. Foster Award for Excellence in 2004 and has been honored twice by the Association of Washington School Principals.

Susan Rauch ('84 Sociology) has served as activity director at Martha & Mary in Poulsbo for the last 14 years and has been reelected as president of the National Association of Activity Professionals. Her previous experience includes serving as co-chair of the Local Arrangements Committee for the 1990 NAAP conference and serving on the NAAP Board in the capacity of public relations and convention and professional development trustee.

Cynthia B. Dillard ('87 MS Voc. Tech. Ed., '91 PhD Ed.) is a professor of multicultural education at The Ohio State University and the first Mary Frances Early Professor of Teacher Education at the University of Georgia. She will join the UGA faculty in January 2012. Her research interests include critical multicultural education, spirituality in teaching and learning, epistemological concerns in research, and African/African-American feminist studies. She recently established a preschool and elementary school in Ghana, West Africa, and published a book in 2007.

Carol Lindahl ('88 Nursing) is a registered nurse in the Patient Resource Department at Mason General Hospital in Shelton, Washington, and was named employee of the month for December 2010. Lindahl has previously worked at Providence SoundHome Care as a First Steps Nurse, in pediatric care at Children's Hospital, Los Angeles, at Mary Bridge Children's Hospital, Tacoma, and as a school nurse.

Allison Coats Nelson ('89 Elem. Ed., '90 MEd) is Kansas Teacher of the Year for her school district. She is the reading specialist at Clear Creek Elementary in Shawnee. Nelson recently earned her reading specialist endorsement through the University of Kansas, and her past experience includes teaching 4th grade in Tennessee and being a substitute teacher in Seattle.

1990s

Rick Bates ('90 Ed. TC) has served as the principal of Sunnyside Elementary for four years and is also a DJ for local radio stations Z-Fun 106.1 and Bull Country 99.5. Bates got involved with radio as a college DJ at WSU and has worked in the radio business for 21 years.

Russell Miller ('91 Eng.) is a law professor at Washington and Lee and has been named a non-resident fellow at the American Institute for Contemporary German Studies. Miller will write publications and essays for the institute's website and newsletter, and lend his expertise in comparative and German constitutional law to various projects and events. Miller is the co-founder and co-editor-in-chief of the *German Law Journal*.

Gretchen Souza ('92 Nursing) is in her sixth year at Olympia Medical Center in Port Angeles and has joined the center's education department in order to focus on staff learning initiatives. Souza will continue working part-time in her current position as supervisor of the hospital's medical/surgical/pediatric unit.

Greg Woods ('92 Psych., '95 Elementary/Secondary Teaching Cert.) has been appointed as principal/superintendent of Griffin School District near Olympia. He is currently the principal of the school.

Mike Sandmann ('93 Comm.) is account manager at International Paper in Moses Lake and has been given the 2010 Container the Americas Sales and Marketing Award of Excellence. In the past, he has worked for Weyerhaeuser and Willamette Industries.

Matthew J. Fox ('94 Crim. J.) has been named principal of Marblehead Veterans Middle School in Marblehead, Massachusetts. Fox has served as principal at Hamilton Wenham Regional High School and the Miles River Middle School, as interim principal at Penn Brook Elementary School, and as assistant principal at the Middle High School, both in Georgetown.

Matthew Caires ('97 Soc. Studies) is the dean of students at Montana State University. He was assistant dean of students for leadership development at the University of Wyoming and assistant director for student activities and leadership development at Saint John's University, Minnesota. While an undergraduate at WSU, Caires was a city councilman in Pullman, WSU student body president, and assistant mayor pro-tempore.

Adam Eltinge ('98 Bus., '99 Const. Mgmt.) was hired by the San Juan Islands Agricultural Guild to be the construction manager for the Brickworks Project in Friday Harbor. His recent projects include commercial development near Seattle and renovating historic carriage houses in Portland. Eltinge previously had his own general contracting business and prior to that he had a residential construction firm in Seattle.

Amy Leonard '11, Elmer F. Leonard '49, and Steve Leonard '81. *Staff photo*

He also brought a young Bobo Brayton into the station. "You may have heard of this guy. Bobo set a few records here and he got a field named after him. He owes it all to me," says Leonard with a sly smile. "No, he's a great athlete and we're still good friends."

Leonard remembers the hard work training with the fire crew on Thursdays, climbing the ladders and inspecting buildings. And the cooking.

"We all took turns cooking, a week at a time. Some of the guys got fired at the end of the first day," he says.

Two of Leonard's brothers also attended the college, as did his sons Paul and Steve and three of their cousins.

In May, the 91-year-old Elmer saw the latest member of his family, granddaughter Amy Leonard, graduate from Washington State University.

"I didn't feel any pressure [to attend WSU] from anyone except myself. When I was in elementary school I decided I was going to WSU. And that's what I did," says Amy Leonard.

She had been to campus many times before with her family. "We stayed down at the RV lot for football games since I was this tall," she says, holding her hand at knee level. "My dad and I came over every year during high school for father-daughter football weekends."

Her father Steve '81 followed his brother Paul '77 to Pullman, but he never doubted WSU was the place for him.

"I was like Amy. I always planned on going here. We'd go to football games, we visited when my brother went here, and I just fell in love with the place," he says.

"I don't think you ever regretted it," says the oldest Leonard with a laugh.

"Never. And never will," replies Steve Leonard. His time at WSU coincided with another major event: the eruption of Mount St. Helens in 1980.

"I went onto my porch and started watching," says Steve Leonard. "You could just see the black cloud moving over. By 2:30 in the afternoon it was pitch black here. It lasted maybe an hour and then it was like very light snow, ash was falling down. So we immediately ran down to get supplies and soon had a 13-day Monopoly game going."

Steve Leonard and his wife own and operate L&L Remodeling in Puyallup. With her degree in management information systems, Amy plans to work in the computer industry.

After graduating with his degree in physical education, Elmer Leonard spent many years as a teacher and administrator, eventually retiring in 1983 as superintendent of schools for the East Valley School District in Moxee.

The Leonards estimate that 18 close relatives have attended college in Pullman, beginning with the first Elmer Leonard.

His name is engraved on the WSU Veterans Memorial, a lasting tribute to the first in a long family tradition of Cougs.

Randall Johnson's Cougar Logo Turns 75

What this place needs

by Tim Steury :: When Randall Johnson was a student at Washington State College, he would occasionally stop and visit Butch. This was the 1930s, when Butch was a real cougar and lived in a cage near Martin Stadium.

"He could care less," wrote Johnson '38 in a short reminiscence, "but it was a great opportunity for an artist to make a close up study of a great subject."

PHOTO RANDALL JOHNSON

Johnson's first logo on a campus truck.

Johnson, who was born and raised in Whitman County, came to Washington State College to study fine arts. His teachers included Worth Griffin and Clyfford Still. He paid his way through college producing "window displays, signs, showcards, and illustrations for books, bulletins and whatever."

In the summer of 1936, Johnson was hired as a sign painter by Fred Rounds, director of Buildings and Grounds. He was kept busy painting door numbers and names on buildings around campus. On the newly rebuilt stand in the football stadium, he painted "No Parking," "Men," "Women," and other fundamentals.

Then one day, Rounds pulled him aside. The Agricultural Experiment Station had bought a new Dodge pickup, which needed identification painted on the door. Problem was, federal, state, and departmental entities needed to be listed.

"I groaned," writes Johnson, "and told Fred it would be easier to inscribe the New Testament on the head of a pin."

Rounds was sympathetic. "What this place needs is some kind of trademark," he said.

So with the studied image of Butch in his head and the intention to build a design around the letters "W," "S," and "C," Johnson, as he put it, did a lot of mental doodling as he went about his other work. Finally, after a couple of nights at the drawing board, he came up with a design.

"I came up with an arrangement shaped like a cougar head with an open-mouthed snarling C. Fitting the other letters together effectively wasn't easy, but finally, Eureka!"

After refining it some more, he took his creation to show Rounds.

Rounds said, "I like it," and at his suggestion they marched up the hill to the administration to show it to acting president Herbert Kimbrough (President Holland was on sabbatical).

Kimbrough looked it over and said, "Go ahead. We'll make it official." Campus decisions seemed to move more quickly in those days.

In spite of his efforts, however, Johnson learned that he had to bow to bureaucratic wishes and include all the entities on the pickup door.

But he had just created the logo Cougars have held dear and identified with for the past 75 years.

The cougar head logo caught on fast, appearing first in parking lots around campus and above the new entrance gates of the stadium. Then it started popping up on stationery, spare tire covers, and Chamber of Commerce banners.

Today, that logo appears on tens of thousands of pieces of merchandise. Although it's impossible to assign a value to the cougar head, over the past 25 years WSU has collected nearly $10 million in royalties from all of its logos and marks.

Having painted his way through Washington State College, Johnson went on to work for Washington Water Power, mostly as its advertising manager, for 38 years.

He married Jeanne Brown, a home economics major.

"When I left Pullman for the new job in Spokane, I couldn't stand the thought of leaving her there with all of those college men," he said in an interview, "so I asked her if she would marry me."

In 1940, soon after Johnson started with Washington Water Power and married, World War II intervened. Johnson started out in infantry, helping to train combat medics. Later, he was

John Pigman ('99 Ed.), **Peter Tingstrom** ('94 Bus.), and **Nadia Daud** ('00 Polit. Sci.) work at the U.S. Embassy in Baghdad, Iraq. None of them realized that there were other Cougar alumni at the embassy until they saw each other wearing WSU t-shirts around the compound. Pigman is a special agent in the Diplomatic Security Service, the U.S. State Department's federal law enforcement bureau. Tingstrom is a lieutenant colonel with the Department of Defense, supporting Operation NEW DAWN. Daud is a supervisory refugee officer with the Department of Homeland Security, USCIS Refugee Affairs Divison.

Jeff Snell (M.Ed. '99), principal of Fort Vancouver High School in Vancouver, was recently appointed to be deputy superintendent of technology and education services for the school district in Camas, Washington. Snell is also an adjunct professor at Concordia University's School of Education in Portland.

2000s

Matthew Canterbury ('01 Psych. '05 Econ.) is engaged to Beth Kleweno ('02 Vet. Med). The couple lives in Alaska.

Joel Ragan Enevold ('03 Bus. Admin.) is senior electrical engineer at MW Consulting Engineers of Spokane and has earned his California professional engineer license. Enevold has worked for MW Consulting Engineers since 2003.

Christopher Gibeault ('03 Bus. Admin.) has been named the 2010-2011 Community Volunteer of the Year by the United Way of Pierce County.

Veronica S. Gunderson ('03 Poli. Sci.) joined the law firm of Miller Barondess LLP in Century City, California. Her experience includes working at the litigation group at Richards, Watson & Gershon P.C. in Los Angeles and as a law clerk for the Hon. Robert L. Hess and the Hon. John Shepard Wiley Jr. of the Los Angeles County Superior Court. Gunderson attended law school at UCLA and was admitted to practice in California in December 2007.

LaToya Harris ('03 Hum. & Women's Studies) is head volleyball coach at Lewis-Clark State College. At WSU she earned All-Freshman PAC-10 Conference honors her first season and first-team All-PAC-10 her final three seasons, along with being the MVP her sophomore and senior seasons. Harris served as assistant coach at WSU and then coached at San Leandro High in California and Sam Barlow High School in Gresham, Oregon. Harris and her fiancé have a 5-year-old son.

Brian MacMillan ('03 Comm.) has been awarded the 2010 Oregon Associated Press first place award for "Best Weathercast." He currently works at KPTV-FOX 12 in Portland, Oregon, as a meteorologist and reporter for the station's top-rated morning and evening shows. Previously, he worked at ABC affiliate KOHD in Bend. MacMillan has a broadcast meteorology certification from Mississippi State University, and while he was at WSU, he was involved in Cable 8 and STAGE.

Christina E. Raschko ('04 Interior Des.) has earned her lighting certification from the National Council on Qualifications for the Lighting Professions. She works as senior lighting designer for ESCENT, the architectural lighting design division of MW Consulting Engineers.

Carli Schiffner ('04 PhD Hist.) is the new provost and vice president for academic affairs at SUNY Canton. Schiffner's research has focused on women's groups in the Pacific Northwest during the Progressive Era and she has been published in *Columbia Magazine* and the *Pacific Northwest Quarterly*. During her time at SUNY Canton, she created a U.S. women's history course, and she is a member of the American Historical Association and of the Humanities Washington Board of Trustees.

Karen Kellar ('05 BS Nursing) is vice president for patient care services at Tillamook County General Hospital. She has clinical experience in cardiac, labor and delivery, post-anesthesia recovery, medical surgery, emergency, and home care.

Jason Blazevic ('06 MA History) received a 2011 Outstanding Student Award given by Idaho State University and the ISU Alumni Association. Blazevic received a doctoral degree in political science from ISU in May, and served as a graduate assistant to the International Affairs Council.

Jaclyn Gotch ('07 MEd) is one of the authors of the children's book *The Itty Bitty Guide to Trees: A Children's Identification Guide to Trees of the Inland Northwest*. The book was created to inspire children and promote learning in a forest environment.

Julie Pickler ('07 Human Dev.) won the Best Public Health Video award from Kansas State University's Master of Public Health program. While at WSU, Pickler was a varsity letter winner in track and placed second in a heptathlon at NCAA Championships in 2006.

William D. Guitard ('08 Account. & Info. Services) is an Army National Guard Specialist who graduated from basic combat training at Fort Jackson, Columbia, South Carolina.

Kelsey Meyers ('09 Ed., '10 TC) teaches first grade at North Bend Elementary and was named Teacher of the Week on April 1 by Seattle's Star 101.5 KPLZ.

2010s

Kimmi Devaney ('10 Animal Sci. & Ag. Comm.) is the producer relations program coordinator at Milk Promotion Services of Indiana Inc. Devaney was the 2009 national president of the American Dairy Science Association Student Affiliate Division. While at WSU, she was the president of the Washington State University Dairy Club and was named Outstanding Senior in Dairy Science. Devaney is the granddaughter of dairy farmers, a member of the Chinook (WA) 4-H Club for eight years, and is a former Dairy Princess.

IN MEMORIAM

1920s

Stanley W. Allgeier ('29 Elect. Engr.), 101, 2009.

1930s

Alma Nelsen Taylor ('32 Office Admin.), 99, April 21, 2011, Marrowstone Island.

Eugene L. Gochnauer ('34 Elect. Engr.), 100, March 10, 2011, Lewiston, New York.

William Arthur Hooper ('35 Speech & Hearing Sci.), 97, March 2, 2011, Seattle.

Alice J. Colburn ('36 Home Ec.), 95, October 29, 2010, Burien.

Otto Amen ('37 Pharm.), 98, April 24, 2011, Spokane.

Mildred Aldene (Bell) Rogers ('37 Home Ec.), 96, April 15, 2011, Blacksburg, Virginia.

Jim A. Sewell ('37 Engr.), 94, March 3, 2011, Newport.

Carl V. Swanson ('38 Zool.), 94, February 23, 2011, Tacoma.

1940s

James Clifford Downey x'40, 91, March 13, 2011, Bremerton.

Louis Alexander Allen ('41 Pharm.), 93, December 1, 2011, Palo Alto.

Ross Emory Berglund ('41 Geol.), 97, March 5, 2011, Seattle.

Lester O. Erikson ('41 Civil Engr.), 90, July 23, 2010, Lynnwood.

Catharine Victoria Goranson ('41 Bus.), 90, March 15, 2011, Portland, Oregon.

Bernadine S. Holt x'41, 92, March 13, 2011, Damascus, Oregon.

John "Jack" Jeanneret x'41, 88, April 23, 2011.

Robert L. Stetson ('41 Chem. Engr.), 92, March 29, 2011, Pacifica, California.

Donald Sheldon Glover x'42, 90, March 27, 2011, Spokane.

Jim Melvin Izett ('42 For. and Rangeland Mgmt.), 91, April 11, 2011, Springfield, Oregon.

Janet Wyse ('42 Engl.), 91, April 17, 2011, Portland, Oregon.

Ruth Graham Allen ('43 Sciences), 91, April 14, 2011, Scotts Valley, California.

June Duby ('43 Bus.), 89, member of Sigma Kappa sorority and the Cougar Marching Band, April 7, 2011, Olympia.

Donald Ross Hales ('43 Vet. Med., '44 DVM), 89, March 9, 2011, Hillsborough, California.

Les Liebel ('43 Ag. '48 MA), 91, April 10, 2011, Pullman.

Robert Randall Zahler x'43, 87, March 1, 2011, Edmonds.

Dorothy M. Day ('44 Home Ec.), 88, December 8, 2010, Victorville, California.

Betty Marie Bulmer Stuhley ('45 Math), 88, May 15, 2011, Seattle.

sent to the Instructional Aids department at the Command and General Staff School at Fort Leavenworth. Johnson led a staff of photographers, interpreters, artists, chart-makers, terrain model-builders, and so forth. Their job was to provide training aids and other information for morning briefings for the colonels attending the school training to be generals.

While in the military, Johnson was surprised and pleased to see his cougar head painted on a Corsair fighter and an A-20 Havoc bomber.

"Of course there was no way I could find out who had chosen those talismans, though I've wished I could. I still believe I might have known those guys."

When Washington State College became a university in 1959, Johnson's design suddenly required a re-design. President French called him to talk it over. Johnson came up with a sketch and presented it, neatly shifting the C of the cougar's mouth to a U.

Johnson died in 2007. His cougar head logo is now 75 years old. «

See the Cougar head logo through the years and all over at wsm.wsu.edu/extra/coug-logo.

Celesta Mae Curtis ('46 Engl.), 87, March 18, 2011, Bremerton.

Arnold Vernon Sundquist ('46 Bus. Admin.), 89, April 16, 2011, Newcastle.

Francis James Bacoka ('48 Phys. Ed., '49 Ed.), 86, February 22, 2011, Mount Vernon, Washington.

Lillie Plowman Freese ('48 Home Ec.), 84, March 26, 2011, Yacolt.

Floris M. Garner ('48 Vet. Med., '50 DVM), 89, March 8, 2011, Rockville, Maryland.

Rutledge Gordon Holleman Jr. ('48, '50 MS Animal Sci.), 86, May 9, 2011, Rockwood, Tennessee.

Leo Moser ('48 Zool.), 87, April 6, 2011, Everett.

William T. Murphy ('48 Mech. Engr.), 87, May 11, 2011, Phoenix, Arizona.

Orville Tillman Anderson ('49 Pol. Sci.), 85, April 22, 2011, Edmonds.

Daniel Granville Bills ('49 Elect. Engr., '51 MS Physics), 86, September 30, 2010, Boulder, Colorado.

Ray Roscoe Milliron ('49 Civ. Engr.), 86, January 24, 2011, Portland, Oregon.

1950s

James M. Anderson ('50 Polit. Sci.), 74, May 8, 2011, University Place.

Nancy Hedstrom Coon ('50 Engl.), 82, January 18, 2011, Coeur d'Alene.

David Waldron Hildner ('50 MS Phys. Ed.), 90, March 31, 2011, Missouri.

Marion Pauline Bigelow Keller ('50 Gen. Studies), 82, March 10, 2011, Bothell.

John J. Schauble ('50 Physics, '53 MS Physics), 84, March 6, 2011, Boulder, Colorado.

Melvin "Dee" Strickler ('50 Forestry), 83, March 12, 2011, Columbia Falls, Montana.

Frederick Gene Wagner ('50 Speech Comm.), 83, January 14, 2011, Las Vegas, Nevada.

Philip Raymond Morgan ('51 DVM), 91, February 26, 2011, Seattle.

Philip L. Smith ('51 Arch. Engr.), 87, March 25, 2011, Marysville.

Suzanne M. Wilkerson x'51, 82, March 14, 2011, Roseburg, Oregon.

Thomas Russell Kurtz ('52 DVM), 90, April 1, 2011, Seattle.

Earl Jewell Lavery Jr. ('52 Pharm.), 82, April 18, 2011, Edmonds.

Robert L. "Bob" McCaslin ('52 Soc.), 84, March 13, 2011, Spokane Valley.

Franklin W. Schläger x'52, 84, March 23, 2011, Mercer Island.

Barbara Ann King ('53 Ed.), 79, March 27, 2011, Toppenish.

Robert Cutler Mack ('53 Phys. Ed., '55 MS Phys. Ed.), March 14, 2011, Soap Lake.

Thomas Jerome Manetsch ('53 Elect. Engr.), 78, January 1, 2011, Janesville, Wisconsin.

Jean Yvonne (Dennie) Burrows ('54 Home Ec.), 79, April 24, 2011, Roslyn.

Marjorie V. Johnson x'54, 78, March 26, 2011, Walla Walla.

Mary K. Parker Otter ('54 Art. Ed.), 78, October 15, 2010, Springville, California.

Marion Otteraaen ('54 Ed.), 78, November 6, 2010, Kelso.

S. Leroy Whitener ('54 DVM), March, 2011, Quincy.

Henry L. Wood ('55 Bus. Admin.), 77, December 17, 2010, Skokie, Illinois.

John Burke Hatfield ('56 Econ.), 80, March 14, 2011, Wenatchee.

Ilene Margaret Smith ('56 Hort.), 76, April 18, 2011, Olympia.

Paul Alan Petty ('57 Phys. Ed.), 76, September 25, 2011, Coeur d'Alene, Idaho.

Harold Duane "Chris" Christensen ('59 Chem. Engr.), 73, February 19, 2011, Springfield, Oregon.

Verlan Glade Leavitt ('59 DVM), 76, April 29, 2011, Alpine, Utah.

1960s

Nelson L. Christensen ('61 Polit. Sci.), April 26, 2011, Hawaii.

Larry Allen Esvelt ('61 Civ. Engr.), 72, April 25, 2011, Spokane.

William Donald Mackin ('61 Finance), 73, April 20, 2011, Ashland, Oregon.

Bob Auth ('63 MFA), 84, May 12, 2011, Boise, Idaho.

Mike Kincaid ('63 Agron.), 70, March 22, 2011, Pullman.

Edward L. Malmsten ('65 Geography, '66 For. and Rangeland Mgmt), 72, March 13, 2011, Oregon.

Wyatt Alan Newman ('65 Soc. Stud.), 69, April 13, 2011, Bend, Oregon.

Gene D. Schaumberg ('65 PhD Chem.), 71, former chemistry professor at WSU Vancouver, January 19, 2011.

Robert P. Maguire ('66 Phys. Ed.), 66, March 14, 2011, Fairbanks, Alaska.

Hadley Ann Alger ('68 Biol.), 64, January 2, 2011, Chemult, Oregon.

1970s

Richard C. "Augie" Agman ('70 Bus. Admin.), 64, April 26, 2011, Spokane.

Michael Joseph Barlow ('72 Bus. Admin.), 63, March 13, 2011, Puyallup.

Alaric "Ric" Faulkner ('72 PhD Anth.), 66, March 18, 2011, Bangor, Maine.

Romae Louise Sargent ('73 Ed.), 60, April 9, 2011, Yakima.

Hilary Haines Bockstanz ('75 Polit. Sci.), 59, April 29, 2011, Las Vegas, Nevada.

William E. "Bill" Greeley ('76 Econ.), 60, March 24, 2011, New York.

Daniel Frank Hudkins ('78 Ag. Econ.), December 24, 2010, Spokane.

John Lyle Sheldon ('79 Ag.), 54, May 18, 2011, Kirkland.

1980s

John Matthew McCarthy ('86 MS Engr.), 63, April 14, 2011, North Carolina.

Judy Stickler ('86 Wildlife Biol.), 47, May 1, 2011, Calistoga, California.

Carolyn Louise (Skinner) Downey ('87 Vet. Sci., '88 DVM), 59, April 11, 2011, Omak.

Daniel D. Moon ('87 Arch. Studies, '87 BAR Arch.), 48, March 6, 2011, Seattle.

Patricia Darlene (Rosenkranz) Krysinski ('88 PhD Ed.), 65, February 11, 2011, Bonaire, California.

1990s

Jeff Donald Helding ('90 Comm.), 49, former employee of the WSU admissions office and TV station, March 18, 2011, Bozeman, Montana.

Doren Fry ('92 Bus. Admin/Int'l Bus.), 41, April 11, 2011, Seattle.

Karl William Schneider ('93 Elect. Engr., '99 MS Elect. Engr.), 47, February 13, 2011, Vancouver.

2000s

James Paul Lincoln ('00 Bus. Admin.), 37, February 20, 2011, Bothell.

M. Louise Collins ('01 BS Nursing, '03 MN Nursing), 53, April 2, 2011, Pullman.

Megan Doherty Banker ('04 Nursing), 38, March 27, 2011, Washington.

Faculty & Staff

David Beckman, 70, retired WSU staff 1985-2006, July 22, 2010, Pullman.

Donald H. Bishop, 90, retired philosophy professor 1959-1991, March 25, 2011, Mesa, Arizona.

Dottie Bell Bottorff, 87, February 12, 2011, Kennewick.

Susan R. Carter, 93, December 7, 2010, Prosser.

Duane Cochrane, 75, retired WSU Facilities Operations 1986-2007, December 1, 2010, Potlatch, Idaho.

Dick Donati, 63, former team doctor for men's and women's athletics, April 21, 2011, Boulder, Colorado.

Andrea Marie Gregg, 30, former University Recreation employee, March 6, 2011, Pullman.

Craig Alan Johnston, 55, April 11, 2011, Glendale, Arizona.

Francis "Rudy" Knott, 71, retired University Publishing employee 1972-1998, November 3, 2010, Richland.

Clara Esther (Hayes) Peterson, 89, retired employee of the College of Agriculture, March 31, 2011, Pullman.

WSU Alumni Association News

Rhonda Kromm '86,'05

WSUAA president Rhonda Kromm '86, '05 with Olivia (*left*) and Zoe—two of her four adopted children. *Courtesy Richardson Studio*

RHONDA KROMM wouldn't let car problems keep her from going to college. Since her old vehicle wouldn't make the drive from Moses Lake, she hitchhiked to Spokane and hiked up the hill to Spokane Community College to enroll. Then she hiked back down the hill to find another ride home.

She wouldn't let money hold her back, either. With an AA degree completed, Kromm took a year off from school to save up. Then she moved to Colfax, spent mornings taking classes at WSU's Pullman campus and afternoons coaching at Jennings Elementary. She finished her degree in education in 1986 and that summer moved with her family to Hawaii, figuring WSU would become part of her past.

It wasn't to be. Kromm continued her involvement with WSU as an alumni volunteer, a grad student, and now president of the WSU Alumni Association (WSUAA).

It was an interesting journey, says Kromm, one that included years as a volunteer with the WSUAA's Hawaii Chapter, where she helped coordinate WSU events, tailgate parties, and summer send-offs for new students. In 2002, Kromm and her family moved back to Pullman. While raising a family, working as a public-school teacher, and earning a graduate degree, she remained an active volunteer with the Palouse Chapter of the WSUAA. Kromm's involvement with the Alumni Association includes, in part, serving as president of two chapters, a member of the Board of Directors, and WSUAA president for 2011-12.

She has also served six years as an alumni representative on the WSU Athletics Council. "It was awesome to be involved with WSU Athletics," she says. Her Hawaii ties made her a great local "auntie" for Hawaii product and Cougar basketball great Derrick Low, who would bring fellow students and teammates over for occasional family dinners. "You could never make too much food for them," she says of Derrick and his friends. Kromm expanded her involvement even further by serving as the alumni liaison to the WSU Arboretum Committee and the WSUAA representative for the WSU Foundation Board of Governors.

Now Kromm, who worked so hard to get to and finish college, finds herself back on campus all the time. Whether it's increasing the number of Cougars who are Alumni Association members or helping the Alumni Association expand its support of WSU, "I'm involved everywhere I can be."

For more information about WSUAA and alumni chapters visit www.alumni.wsu.edu *or call* 1-800-258-6978.

For more reviews and sample tracks go to wsm.wsu.edu

The Docks *by Bill Sharpsteen '80*
UNIVERSITY OF CALIFORNIA PRESS, 2011 :: *Review by Eric Sorensen* :: In my sailing days on Puget Sound, I got used to watching for the fast-moving container ships that could overtake my little boat in a matter of minutes. One day, I found their schedules on the Internet and saw the outline of a huge, economically powerful engine tying together goods from around the world.

In *The Docks,* Bill Sharpsteen '80 shows us this world by peering into the Port of Los Angeles. It's as good a place as any to illustrate the characters and conflicts that arise when you jam an inordinate share of a nation's waterborne cargo through a single, dangerous, lucrative hole in a coast.

"It's so big, so vital," writes Sharpsteen, "that if it suddenly shut down, which has happened, our entire country would buckle at its knees, which has also happened."

Sharpsteen spent about a decade pondering what turned out to be a bewilderingly large operation. One-quarter of a trillion dollars in global trade can go through the port in a year. With the nearby Port of Long Beach, it employs half a million people.

Sharpsteen, in effect, interviewed the various blind men holding on to various parts of the elephant, from rank-and-file longshoremen to the port's guarded and seemingly scripted executive director. The technique deprives the book of an overarching narrative, but it does take us into a lot of places we might never go.

Here's a pilot parking a 698-foot container ship; there's a tug captain doing the same with 4,800 horsepower and an 8-inch towline. But on shore things get messy as the forces of capital, collective bargaining, public health, global economics, and women's rights collide.

We see Noel Park, a resident of nearby San Pedro, struggle for years to improve the "diesel death zone," as ships put out the exhaust of 1,200 cars, from a fuel with 1,000 times the sulfur as that used by a modern truck. His efforts are repeatedly stymied in a pattern of battles and defeats that will be familiar to many an activist. At last, he quits.

The odds also seem stacked against Gretchen Williams, one of the first female longshoremen. Men veer at her as they unload new Toyotas. When she tells a supervisor that men have tried to sexually assault her, he says, "Don't worry about it, little lady."

At last a private law firm takes up her cause with the complaints of half a dozen other women, and a federal judge imposes hiring quotas for women on the union local. Williams calls the case "the most successful affirmative action program in the country. Ever." But in an ironic footnote, the job openings her fight created often go to the wives, girlfriends, and mistresses of some of the men most opposed to hiring women.

Sharpsteen fought his own battles to get this book done. It sometimes took him years to get interviews and documents.

"Everyone, it seems, has some secret they'd rather keep to themselves, while perhaps ignoring the biggest one—that their industry has become so intertwined with the U.S. economy that all it takes is a small fire at a crane or a single labor dispute to ripple across the country, potentially costing the nation billions."

Like many of the people he met along the way, Sharpsteen persisted. His efforts have paid off handsomely. ⊗

L.A. Rendezvous *by Charles Argersinger* 2010 :: *Review by Brent Edstrom '87* :: I have long admired Dr. Argersinger's work so I was eager to hear his new CD, *L.A. Rendezvous*. Argersinger (a retired WSU music professor) is a consummate composer of contemporary art music and a superb jazz arranger and composer, so it was no surprise that the album exhibits a high level of craftsmanship. What did surprise me is the variety of instrumental and vocal selections featured on the album. The CD consists of arrangements and compositions for jazz ensemble as well as three pieces for *a cappella* choir. Several of the jazz ensemble pieces (and one small group selection) feature jazz vocalist Sunny Wilkinson. Although it is rare to find an album consisting of such a wide range of material, the pieces work well together and make for a cohesive whole. It's akin to visiting an art exhibit by a single artist—Argersinger's unique voice as an arranger and composer provides the thread that ties the album together. To quote the liner notes, "Each piece is chosen for its place in Argersinger's compositional history and reflects a giant step on the path to his compositional success."

Throughout the album it is clear that Argersinger is a masterful and innovative composer and arranger. His work is harmonically sophisticated and the arrangements develop in a convincing way. Composers sometimes refer to the concept of *la grande ligne*—the long line or feeling of flow or inevitability that is evident in an effective composition. That reference came to mind as I listened to the arrangements and compositions. Argersinger is a master of pacing and, while there are many surprises, he develops the pieces in a way that feels organic.

I have commented to students that most good music has a linear dimension, and that comment seems relevant to *L.A. Rendezvous*. When a composer or arranger uses a linear approach, more emphasis is placed on the independence of melodic lines. I enjoyed hearing Argersinger's frequent use of linear process and particularly enjoyed his use of counterpoint in pieces including "Salsa 'n Peppers" and "High Wire."

Singer Sunny Wilkinson is featured on several selections, and I was struck with how well the arrangements fit her voice—like the proverbial hand in glove. Wilkinson sounds terrific and I appreciated her strong interpretations of tunes including "Exactly Like You" and "It Could Happen to You" as well as her fine scat solos. The album also features many outstanding instrumental solos including a wonderfully emotive introduction to "Waltz for Debby" performed by pianist Ron Newman.

Production values are high and it is clear that great attention to detail went into the mix. Each instrument and vocal track has its own space in the mix, and the recording has a polished feel that fits the well-crafted arrangements and compositions.

Perhaps the highest compliment I can pay to Dr. Argersinger is that I look forward to revisiting *L.A. Rendezvous* in the future. There is a lot to take in from his raucous original "Rage Cage" to the impeccable Voice Trek [vocal quintet] performances of "The Windmills of Your Mind," "A Little Luck," and "Not Like This." Argersinger takes the listener on a multilayered journey—and it's a journey you will want to repeat.

Brent Edstrom is an associate professor of jazz studies, music theory, and composition at Whitworth University. ⊗

A Chinaman's Chance *by Alex Kuo*
WORDCRAFT OF OREGON, 2011 :: *Review by Angela Sams '11* :: WSU English professor Alex Kuo's newest collection of poetry, *A Chinaman's Chance: New and Selected Poems 1960-2010*, will sadden, fascinate, and unexpectedly jar its readers into a fresh perspective of the sometimes terrifying world that we live in. This collection of Kuo's poems provides a nice poetic balance, as readers are able to experience lyrical, narrative, and prose poetry all in the same book. Kuo's writing conveys ideas about space and place and how the meaning of place changes along with the people who inhabit it.

Spanning continents and decades, his portrayal of "fierce geography" demonstrates a vast knowledge of landscapes worldwide. His geographical commentary not only tells the story of his life as a child in China and later as a forest firefighter in the Pacific Northwest, but also the stories of those involved in violent and catastrophic wars and occurrences throughout the past century. The powerful words of Kuo's writing will evoke complex emotion for familial ties as well as historical events and wrongs done to humans and the environment alike. He is not afraid to let his words serve as a subtly crafted but hauntingly brutal criticism of world issues and injustices. *A Chinaman's Chance* is a challenging and intense read, yet well worth the refreshing history lesson that it provides. These poems condemn those who need to be condemned and illustrates nothing but the necessary truth—something that is crucial if we are to consider ourselves informed human beings.

Kuo is the former teacher of accomplished poet Chris Forhan, author of *Black Leapt In* (reviewed in *Washington State Magazine*, Spring 2011). In addition to publishing more than 350 poems, essays, and photographs, Kuo has received three National Endowment for the Arts fellowships and was also given a Senior Fulbright lectureship, among many other honors. ⊗

new & noteworthy

Albert Schweitzer's Legacy for Education *by A.G. Rud* PALGRAVE MACMILLAN, NEW YORK, 2011 :: WSU's new dean of the College of Education examines the life and philosophy of Albert Schweitzer, and how Schweitzer's "Reverence for Life" concept can be applied to teaching and education. ⊗

Coming Clean: Information Disclosure and Environmental Performance *by Michael E. Kraft, Mark Stephan, and Troy D. Abel* THE MIT PRESS, CAMBRIDGE, MASS., 2011 :: Mark Stephan, an assistant professor of political science at WSU Vancouver, and his colleagues analyze corporate disclosures of environmental impacts and release of pollutants. They show that toxics release information has had substantial effects, but the impact has been uneven and can be improved. ⊗

The New Arab Journalist: Mission and Identity in a Time of Turmoil *by Lawrence Pintak* I.B. TAURIS, LONDON, 2011 :: Building on a broad survey of Arab journalists, his own experience in the Middle East, and interviews with Arab journalists, founding dean of the Murrow College of Communication, Lawrence Pintak delves into the complex and rapidly changing world of Arab journalists and media. ⊗

DAVID R. IRONS JR.

To the lighthouse

by Hannelore Sudermann

FOR MORE THAN A CENTURY one of Washington's earliest man-made landmarks has perched 120 feet above the sea on the bluff at Admiralty Head on Whidbey Island. In its early years, the lighthouse beacon guided the sailing ships that helped settle Puget Sound. Today the white stucco structure with its 30-foot tower charms visitors exploring the island.

The first lighthouse was built on Admiralty Head (also called Red Bluff) in 1861. At the time, the building was made of wood and the lamp was fueled by whale oil. It had to go, though, to make room for Fort Casey, a U.S. military post. In 1903, a replacement lighthouse was built a few hundred feet to the north. The building, which stands today, was made of brick and covered with stucco in the California Spanish-style design of architect Carl Leick. It was quite fancy, with an indoor bathroom and spacious living quarters that during its years of operation suited several different lighthouse keepers and their families.

At night when ships sailed through the strait, they would use this lighthouse and the one at Point Wilson on the other side of Admiralty Inlet to know when and where to turn south and into Puget Sound. "It wasn't here to warn sailors of harm. It was here to guide them," says Julie Pigott, program coordinator for WSU's lighthouse docent program, which staffs the lighthouse for visitors. But when there was fog, the house did have a horn.

The lighthouse was decommissioned in 1922 because steamships with more sophisticated equipment could more easily navigate along the west shore of the inlet, and because the lights from Fort Casey provided a bright enough landmark for the nighttime traffic.

With the exception of World War II, when it was painted green and made into living quarters for soldiers stationed at the fort, the structure was forgotten. In the 1950s, the Washington State Parks department and the Island County Historical Society made repairs and opened it to the public. But 40 years later the state parks department lost money for managing the lighthouse and had to cease both restorations and public visits. That's when WSU's Island County Extension office stepped in, offering to staff the historical site with local volunteers in exchange for office space on the second floor for its Beach Watchers and other programs.

The main floor, which comprises the entry, living room, dining room, and kitchen of the lighthouse keepers' residence, is now a museum and gift shop. Visitors can learn the history of the landmark and see up close the large fourth order Fresnel lenses that could beam enough light to be seen 16 miles away.

Explore an interactive lighthouse and read about the volunteer docent program at wsm.wsu.edu/extra/lighthouse.

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{ *Navigation tools* }

COVER / BACK PAGE

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RETURN TO SPREAD VIEW

PREVIOUS / NEXT PAGE

TABLE OF CONTENTS
CLICK ON TITLES TO GO TO STORY

SCROLL PAGE
(IN ENLARGED VIEW)

WEB LINKS
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CLICK HERE TO EXIT
OR USE ctrl/cmd-Q