

# DISCOVER

CELEBRATING NORTHERN KENTUCKY UNIVERSITY RESEARCH AND CREATIVITY 2012-2013

Cover story:  
A team approach to  
river research

In memoriam:  
Paying tribute to  
Dr. Heather Bullen

Student research:  
A cross-disciplinary  
sample





## Dr. Gail Wells

Vice President for Academic Affairs and Provost

From synthesizing the cancer-fighting extracts of the blue passion flower to mapping cyber strategies to thwart computer hackers, the Northern Kentucky University faculty is busy with research.

It's high-end, rigorous research that results in peer-reviewed articles in leading journals, presentations at prestigious conferences and publication in scholarly books. It's the kind of work that would be at home in the nation's top research universities.

Our university is young and not, by classification, a "research university." Our mission is focused on teaching, scholarship/creative activity and regional stewardship. But here's the thing: We cannot be outstanding in any of those without a deep commitment to research. When it comes to excellence in the classroom or in the community, everything starts with inquiry; everything starts with research, whether it's the scholarship of discovery, integration, engagement, pedagogy or application.

When a chemistry professor such as Dr. Lili Ma heads into lab to figure out how to synthesize the isoflavanones found in *Passiflora caerulea* (the blue passion flower), she is simultaneously becoming a better teacher. So, too, with Dr. James Walden, whose research into computer security keeps him up-to-date in a field where cyberthieves are forever trying to race ahead of the latest security protocols. To teach the next generation of computer scientists how to detect vulnerabilities that might open a network to nefarious intercepts, Dr. Walden has to stay current. His research assures that.

You can read more about Dr. Ma's and Dr. Walden's work in this issue of *Discover*, our fifth. As in past issues, the stories offer a wonderful sample of the breadth of research and creative work happening at NKU. You will find a story from each of NKU's six colleges, Arts and Sciences, Business, Education and Human Services, Health Professions, Informatics and Law.

You will also find a story about a growing, cross-disciplinary emphasis on research connected to the Ohio River watershed. Biologists are involved, as you would expect; but so are students and faculty from computer science and education. Such collaboration is a real strength of NKU. We are a university where faculty and students engage and interact across disciplines as a matter of routine.

experience, which has prepared them for whatever career path they choose."

Each spring, we host a Celebration of Student Research and Creativity. Student projects are listed in the program along with the faculty sponsors who supported the work. It's no accident that Heather's name turned up repeatedly in the program, supporting 11 student research projects. Heather enabled her students. On her Web page, she invited them to contact her about research opportunities with this welcoming message, and a triple exclamation mark: "The only prerequisite is that you are interested!!!"

I like to imagine this: One day, a student of Heather's will discover a cure for the cancer that ended her life much too

*"When it comes to excellence in the classroom or in the community, everything starts with inquiry; everything starts with research."*

Finally, I want to take a moment to dedicate this issue of *Discover* to one of the most extraordinary faculty members NKU has ever had – and sadly, one we lost this year.

Dr. Heather Bullen was an associate professor of chemistry who arrived at NKU in 2004 with a Ph.D. from Michigan State University, a smile that lit up a room and a passion for research that was infectious, especially for students. "One of the most effective ways to teach our students is by involving them in undergraduate research," Heather said in an interview last year. "In our labs, students are getting graduate-level

early. Whether or not that happens, we know that those students who were lucky enough to be in class or in the lab with Heather will never forget the experience. And they enter their careers well-equipped to meet the challenges ahead.

Yes, Heather's years with us were much too short. But she filled those years with accomplishments, love and joy that will long impact those whom she touched and inspired. To live in the hearts of those left behind is not to die. She will continue to live in the hearts of her son, husband, parents, grandparents, friends, colleagues, students and all those who had the pleasure of interacting with her.

Watershed Moment..... 4

Examining healthcare’s balance sheet ..... 7

The fine art of recovering art ..... 9

Giving an original thinker her due ..... 11

Staying ahead of the hackers ..... 13

Photos give at-risk students a voice ..... 15

In memory of Dr. Heather Bullen ..... 17

From research lab to bedside ..... 18

Synthesizing isoflavanones ..... 21

Student Research..... 23

**COVER PHOTO:**

*NKU environmental science major, James Brown, samples for greenhouse gas fluxes at the St. Anne Wetland in rural Campbell County, Ky. Biology Professor Kristy Hopfensperger records his readings. See story on page 4.*

NKU Photo/Timothy D. Sofranko

**BACK COVER PHOTO:**

*Students gather on a walkway by the University Center with the Fine Arts Center in the background.*

NKU Photo/Timothy D. Sofranko



# DISCOVER

## ABOUT THIS MAGAZINE

This is the fifth edition of DISCOVER, a publication dedicated to celebrating the creativity, variety and depth of research by Northern Kentucky University faculty and students. Past editions of DISCOVER are available online at <http://nku.edu/discover>.

This edition of DISCOVER was produced by NKU’s Office of Research, Graduate Studies and Regional Stewardship under the direction of Associate Provost Dr. Jan Hillard. It was designed and published by NKU’s Office of University Printing, under the direction of JoAnn Fincken and designer Leigh Ober. The editor was Mark Neikirk, director of the Scripps Howard Center for Civic Engagement, and the co-editor was Bob Driehaus, a Cincinnati-based freelance writer. Center for Civic Engagement interns Stacey Barnes and Taylor Vick contributed.

Copyright 2012. Northern Kentucky University.

*This publication was prepared by Northern Kentucky University and printed with state funds (KRS 57.375). NKU is an affirmative action/equal opportunity institution. 15719*

# Watershed Moment

By Bob Driehaus

A conservationist might have surveyed the polluted Ohio and Licking rivers 30 years ago and despaired. Decades of heavy industrial dumping had combined with the discharge of raw sewage to leave the rivers in distress.

The same conservationist might look today and wonder if the problem is intractable. Sewage, industrial waste and agricultural runoff still pour into the rivers untreated.

Hopeless? No. But improvement takes time. And it takes research, carefully conducted to pinpoint the effects of modern life on water quality, plant life and animal life. Northern Kentucky University professors, often with students at their side, have been hard at work on that task. Workable solutions are emerging to put the goal of cleaner, recreation-friendly rivers within reach. Hand-in-hand is an effort to teach future scientists – whether they are in the first grade or college today – to continue the work tomorrow.

Dr. Kristy Hopfensperger, assistant professor of biological sciences, studies nitrogen pollution in the Licking, comparing concentrations at different points along the river between Butler, Ky. and the Licking's terminus at the Ohio. Nitrogen, a key ingredient in crop and lawn fertilizers, can launch a chain of events that result in dead zones in the river. Nitrogen encourages abnormally fast algae growth. When the algae die, other organisms break down the plant matter and consume oxygen that fish, insects and other fauna and plants need to survive.

The problem is not new, but Hopfensperger's research suggests it is also not insurmountable. Even a thin strip



*Environmental science major Zach Poynter samples soil oxygen levels at the St. Anne Wetland in rural Campbell County, where NKU faculty and students are pinpointing the effects of pollution on the Ohio River watershed.* NKU Photo/Timothy Sofranko

Across disciplines, NKU researchers are contributing to solutions that give the Ohio and Licking rivers a fighting chance against a legacy of pollution. Their work also is contributing to a broader body of knowledge on how to protect the nation's waterways.

of soil along the river can accommodate microbes to feast on the nitrogen that is headed toward the water from homes and businesses. “If a city area is going to have a lot more impervious pavement, it’s important to have the riparian systems to remove nitrogen before it enters the waterways,” Hopfensperger said.

At another site, she and her colleagues are using a federal Environmental Protection Agency grant to conduct research in Boone County that sets out to measure how much nitrogen is running off parking lots and other pavement into storm-water retention areas and other wetlands. They also are trying to identify the plants and soil conditions that are most effective in removing the nitrogen. The EPA hopes to apply nationally what the NKU team finds out locally.

Hopfensperger’s work is just a part of NKU’s focus on the complex and fascinating business of identifying pollutants and other enemies of healthy waterways. The tadpole and its arch-enemy, invasive honeysuckle, are the subjects of research by Dr. Richard Durtsche and Dr. Richard Boyce, both assistant professors of biology. Their testing ground is the St. Anne Wetland, a 100-acre site in Melbourne, six miles east of campus and across the road from the Ohio River.

At St. Anne’s and throughout our region, Amur honeysuckle, an export from China, is crowding out native vegetation. Its leaves emerge early and shed late, hogging sunlight from competitors. And Durtsche and Boyce have documented an even more sinister trick up the honeysuckle’s sleeve: It poisons its neighbors. A chemical compound in the honeysuckle’s leaves disperses in the soil around it, acting as herbicide to its would-be competitors. The damage from those chemicals spreads to the water as well. Durtsche and his students have studied the effects of the honeysuckle leaves on the development of tadpoles and adult frogs, grinding up honeysuckle leaves and native plant leaves into sort of tea in which the tadpoles’ development can be observed.

“Honeysuckle is really flooding the aquatic system with these chemicals,” Durtsche said. “When at 1 gram of dry

*“The river is in good shape. I’ve been working on it for 30 years, and it’s getting better and better....  
The quality of the water, the diversity of fish, it’s all improved.”*

— Biology Professor Miriam Steinitz Kannan

leaf matter per liter of water, it kills most of the tadpoles.”

The survivors grow into froglets that jump shorter distances than their counterparts and tire more easily, compromising their ability to escape predators. Durtsche and his students also found that decaying honeysuckle leaves are consumed by bacteria that use more oxygen in the water than the bacteria that eat native plants, creating another instance of oxygen-starved water that depresses fish and other wildlife populations.

Boyce, meanwhile, determined that honeysuckle consumes roughly 10 percent more water than the native species it supplants. “Ephemeral ponds that are there in spring but dry out in summer are essential to tadpoles because there are no fish predators,” he said. “But honeysuckle makes ponds dry out more quickly.” The change is a big one for frogs, which rely on ephemeral ponds to lay their eggs and develop their tadpoles. If those ponds dry up more quickly, frog populations suffer.

The fight against the spread of honeysuckle may be getting an assist from Mother Nature in the form of blight that eats the plant’s leaves. Boyce said the blight was more prevalent in 2012 than in past years. But the slow course of evolution won’t fix the problem quickly enough, so Boyce, Durtsche and others are working on mitigation.

“It’s here to stay,” Boyce said. “The question is can we figure out a way to make it less of a thug than it is.”

While much of the waterway research by NKU students and faculty targets specific

problems, Dr. Miriam Steinitz Kannan’s work involves the bigger picture. She, her students and their community partners monitor the Ohio River’s overall health. Steinitz Kannan, an NKU Regents Professor in the department of biological sciences, has partnered with the EPA, ORSANCO (the Ohio River Valley Water Sanitation Commission), several water departments and other universities during her three decades of studying the Ohio River. She has helped create an index for ORSANCO to identify algae found in the region’s water sources and what their presence or absence means for the water’s health. “Certain species indicate if there are large amounts of organic matter in the water. Others indicate low oxygen levels or high concentrations of nitrogen,” she said.

Her many other field experiments include tracking algae in ponds, including a recent expedition with her students dubbed a “pond scum field day.” Before that, Steinitz Kannan’s sleuthing helped the Wyoming, Ohio, water department identify the source of its water’s temporary purple hue – a harmless bacteria, she was glad to report.

Years of improved stewardship have paid off for the Ohio River and its tributaries, Steinitz Kannan said. “The river is in good shape. I’ve been working on it for 30 years, and it’s getting better and better. We have periods of time when we have algae blooms or something, but the quality of the water, the diversity of fish, it’s all improved,” she said.

Steinitz Kannan credits a reduction in

combined sewer and storm-water lines, which, in rainy periods, deliver untreated sewage directly into the Ohio and Licking rivers. Other mitigation is working, too. She cites the Sanitation District No. 1's program to encourage rain gardens.

It takes more than a few professors and their students to tackle big environmental challenges. To that end, professors like Steinitz Kannan, who conducts a summer science camp, and Dr. Steve Kerlin, director of NKU's Center for Environmental Education, are enlisting children and their teachers in the effort to better understand the ecology of the waterways.

Last June, a group of elementary and high school students enrolled in a Center for Environmental Education course that involved a weeklong canoe and kayak trip up the Licking River. The idea is simple: Teach the teachers, and they'll teach the children. As they paddled the river, the teachers stopped to collect biological samples since what is found living in the

water is a gauge of the pollution – or lack of it.

"Some species can live in all kinds of water. Others can only live in good quality water," explained Kerlin. "We look for diversity of species, a bioindicator that water quality is fairly good. If we're finding the larva of leeches and bloodworms, and not finding mayflies, it's likely poor quality. Once we know that, we can look for other indicators to find exactly what's wrong."

The center also works with Boone County High School students at Gunpowder Creek, an Ohio River feeder stream, introducing them to ways to measure a waterway's health. Community programs, participation in World Monitoring Day in October and other events with younger students round out the center's outreach activities. The goal, Kerlin said, is to raise awareness of local environmental issues while also guiding participants to make informed decisions about conservation and mitigation.

Such efforts are intrinsic to NKU's mission, said Dr. Jan Hillard, associate provost for research, graduate studies and regional stewardship. NKU, he said, takes a particular interest in elevating student interest in science, technology, engineering and mathematics or, as they are often called, the STEM fields. But, he added, scientists are not the only NKU faculty contributing to the discussion of the region's water ecology. Expertise in literature, informatics, art, music and history also offer a connection to ecology and the river, and Hillard is looking for new ways to connect those disciplines even more so in the future. There could, for example, be a writing retreat with the river as the subject of essays and poetry.

"The driving emphasis rests upon the value of bringing these resources together with the opportunity to leverage NKU's expertise to new initiatives and opportunities," Hillard said.



Northern Kentucky and Cincinnati have made development along the Ohio River a priority, and the effort is starting to pay evident dividends.

*The New York Times* captured the trend succinctly in a June 2012 story. "The shoreline of this Ohio River city, which in the 19th century hummed with 30 steamboat visits a day but faded in the 20th as pollution and industrial disinvestment pushed people and businesses inland, is emerging again as a hub of civic and economic vitality," the *Times* wrote. The story added a touch of history by quoting Alexis de Tocqueville from 1831, describing the Ohio River's cut through Cincinnati as "one of the most magnificent valleys in which man has made his stay."

A boom of restaurants, office towers, apartments and condos line the riverfront today. A network of walking and cycling trails is in varying stages of completion along the Ohio and the Licking, and more such recreational uses are imagined.

But if the rivers aren't cleaned up, can the trend maintain traction? NKU's research focus on the Ohio River watershed represents a piece of the region's effort to make sure the vision doesn't founder.

"NKU is deeply committed to applied research that provides benefit to the region," said Dr. Jan Hillard, associate provost for research, graduate studies and regional stewardship. "This commitment extends to the Ohio River and our area's waterways. While NKU does not take a role in policy advocacy per se, we do have strong partnerships and collaborations with regional organizations."

One such organization is Confluence, a relatively new tri-state collaboration among government, business and education leaders with a mission to establish the region as a global leader in sustainable, environmental technology innovation, with an initial emphasis on water. Hillard is working closely with Confluence, and NKU has hosted the group on campus.

Another partner is the U.S. Environmental Protection Agency. NKU and the EPA are co-sponsoring a workshop on citizen scientists, inviting citizens to help monitor water quality and submit data for subsequent research and analysis. With a mission that includes a commitment to regional stewardship – a College of Informatics where new applications for smartphones and tablets are being developed by students and faculty – NKU is well-positioned for such a partnership.

"The concept of the citizen scientists perfectly fits with NKU's educational mission and assets. These include the development of software and apps designed to facilitate data collection and analysis," Hillard said.



*A few months after passage of the Patient Protection and Affordable Care Act in 2010, President Barack Obama and Health and Human Services Secretary Kathleen Sebelius shared a stage in Maryland to defend the sweeping law that became known as “Obamacare.”*

Associated Press photo.

# Examining healthcare’s balance sheet

## High costs don’t assure quality outcomes

By Kevin Osborne

It doesn’t matter if you’re a Republican or Democrat, a conservative or liberal, or even if you support Obamacare or hope it is repealed. A close examination of the facts results in a crystal-clear prognosis: The U.S. healthcare system is critically ill and needs help.

Statistics about the nation’s healthcare system during the past few years have been consistently dismal. For example, healthcare spending in 2009 accounted for more than 17 percent of the U.S. economy, or \$2.47 trillion (yes, with a “t”) – more than the entire GDP of Great Britain.

Although the United States spends more than every other industrialized Western democracy on healthcare, its outcomes don’t lead the world. Australia, Canada, Germany, the Netherlands, New Zealand and the United Kingdom all fare better on performance measures for quality, efficiency, access to care, equity and the ability to lead long, healthy lives, according to a study by the Commonwealth Fund, a private organization founded in 1918 to improve the U.S. healthcare system. Other



*In 2009, U.S. Rep, John Boehner of Ohio stood behind the legislation that became Obamacare over his objections. He was the House minority leader then and majority leader now. In both roles, he has opposed the president’s solutions but not disputed the underlying challenge – that healthcare costs are too high.* Associated Press photo.

studies have yielded similarly depressing results.

Many factors contribute to the poor showing, including demographic shifts, fraud, systemic inefficiencies, unhealthy lifestyles, and jumps in the number of the poor and uninsured. That's where the research of Dr. Linda Dynan plays a crucial role in reversing the bleak situation.

Dynan is an associate professor of economics in Northern Kentucky University's Haile/U.S. Bank College of Business. She focuses on the economics of providing healthcare. Her most recent work has examined the prevalence of medical errors in hospitals that have varying levels of reliance on Medicaid payments.

In July 2012, a "pay for performance" component first tried with Medicare (the government insurance program for the elderly and disabled) was extended to Medicaid, the parallel program for low-income families. Pay for performance is intended to improve healthcare services while helping to contain skyrocketing costs by discouraging unnecessary procedures. As part of pay for performance, the government reduces or eliminates payments for medical care that results in illness or death. In short, hospitals that show good outcomes with patients get rewarded, while hospitals with patients that get sicker or die get less funding or none at all.

Sometimes, though, new policies can have unintended consequences. Dynan is studying whether pay for performance is truly improving hospital efficiency and the care received by patients. Her work has catalogued the types of errors that have occurred, what characteristics are shared by facilities that make the most errors, and whether policy directives are producing better outcomes.

"Overall, the research focuses on improving the cost and quality of in-patient care," Dynan said. "I've found that not all medical events that look bad are necessarily avoidable."



*"How to provide quality care at lower cost is key to any healthcare reform. There's enough research to do in that area to keep me busy for the next 50 years or so."*

— NKU economics professor Linda Dynan

For example, some patients may need to stay on respirators longer. That increases the likelihood of infections developing, but a physician may deem that's a reasonable tradeoff for a better outcome later. As a result, such doctors shouldn't be penalized for having a higher infection rate among their patients.

To view the operations of a medical facility up-close, Dynan also is an adjunct research associate professor in the University of Cincinnati's Pediatrics Department, which allows her to work at Cincinnati Children's Hospital Medical Center.

One of Dynan's most widely disseminated studies probed racial disparities in health outcomes and whether Medicaid's policy of non-reimbursement for adverse events like death worsens the problem.

"Medicaid has a relatively low reimbursement rate compared to private insurance and even Medicare," she said. Facilities that rely heavily on Medicaid are so-called "safety net hospitals" that function as a caregiver of last resort for the uninsured. Such hospitals often have "Medicaid-induced financial stress," Dynan added, because many of the patients they treat have multiple, previously untreated medical problems that make adverse events more likely.

In 2005-07, Dynan and her colleagues looked at nearly 986,000 pediatric discharges of children from 1,050 community hospitals nationwide. They found that children in hospitals with

relatively high proportions of pediatric discharges that rely more heavily on Medicaid reimbursements are more likely than children in other hospitals to experience an adverse event. It concluded the comparatively low Medicaid reimbursement rate may contribute to the problem of adverse medical events for children, and that policies to reduce such events should account for differences in underlying, contributing factors.

"What really mattered is not just the severity of illness but also kids who have the highest number of chronic conditions," Dynan said. "It raises questions whether pay for performance is actually the best way to address this. It could make the problem worse."

With the political debate over Obamacare ramping up again in light of the Supreme Court's recent decision that upholds most of the law and the ongoing political debate in Washington, Dynan's expertise likely will become more relevant than ever.

"How to provide quality care at lower cost is key to any healthcare reform," she said. "There's enough research to do in that area to keep me busy for the next 50 years or so."

**LINDA DYNAN** is an associate professor of economics. She has been at NKU since 2004, and teaches in the Department of Marketing, Economics and Sports Business.

**EDUCATION:** Ph.D., Columbia University, 1994, M.A., Columbia University, 1991, M.Phil., Columbia University, 1991, B.A., University of Pennsylvania, 1986.



# The fine art of recovering art

Untangling a mess left by Hitler's plunder

By Paul A. Long

Teacher. Speaker. Litigator. Investigator. Author. Researcher.

They all describe Jennifer Anglim Kreder, professor of law and associate dean for faculty development at Northern Kentucky University's Salmon P. Chase College of Law.

She uses her familiarity with the world of art, her mastery of the legal system, and her ability to speak German to help people recover artwork that was left behind, stolen, looted, sold or otherwise lost by families and artists in Europe during the Nazi years before and during World War II.

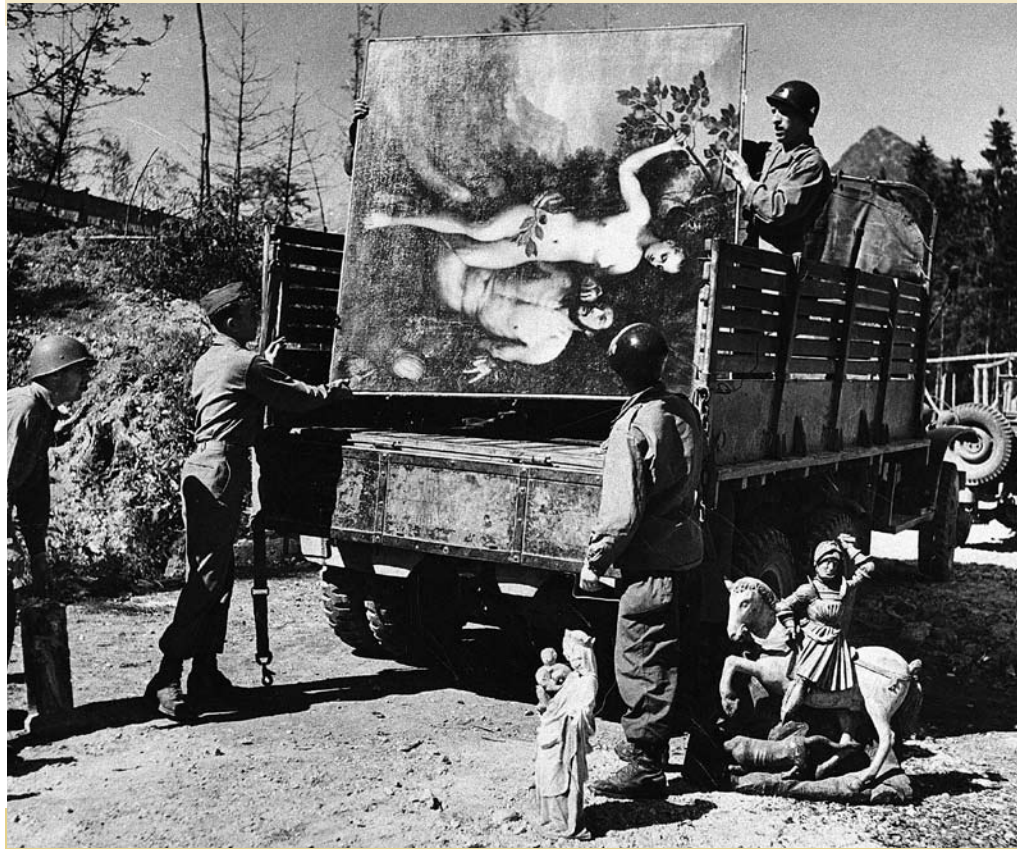
Her area of specialty has pitted her against some of the top museums in New York City, including the Metropolitan Museum of Art, the Museum of Modern Art and the Guggenheim Museum, all of which have possessed some of the art in question.

"The Nazis viewed modern art in particular as being degenerate... And that modern art movement was largely sponsored by Jews," Kreder said.

Although about 5,000 of the genre's paintings were destroyed, in other instances the Nazis recognized the value of what they'd taken and sought to profit.

"So it was also getting traded through auctions in Germany and in Switzerland and in France and elsewhere," Kreder said. "A lot of people went over and bought at those auctions, including people who were buying for a lot of powerful people in the United States. A lot of that art went into private collections. And a good bit of it wound up in our most prominent museums."

World War II ended in 1945 with the Nazis vanquished. But the upheavals would last, bequeathing the Cold War and the nuclear age. The aftermath in the art world might not rise to the same level of international tension, but it certainly has proven a stubborn and mendacious legacy as Jennifer Anglim Kreder could readily testify.



Military personnel unload some of the art treasures recovered from Hermann Goering's cave in the mountainside at Konigsee in May 1945. Goering collected art and jewels looted from all parts of Europe during World War II. Associated Press photo



Katherine Boyle of Bonhams auction house in London examines porcelain figures that were damaged by World War II bombing in Dresden, Germany. The figures were part of collection seized from Jewish collectors by the Nazis. Associated Press photo



## Professor Kreder states the issue

When the modern wave of claims against museums to recover paintings “displaced” during the Nazi era began, I, as an academic, approached the claims cautiously because I assumed that our esteemed institutions would not have knowingly profited from the spoliation of property belonging to millions of persecuted refugees.

I was wrong. I have come to understand, based on objective, historically sound records, that a significant number of our museums during and in the aftermath of the Holocaust actively acquired art that they knew or should have recognized likely came from Jewish homes and businesses.

These museums acquired this exquisite art despite widespread knowledge of Nazi looting and governmental warnings about the infection of the art market. Now, museums are using American courts to shut down inquiries into such art’s history by blocking claims on technical grounds, contrary to their own ethics guidelines and U.S. executive policy.

---

Excerpted from “Guarding the Historical Record from the Nazi-era Art Litigation Tumbling toward the Supreme Court,” an essay in the *University of Pennsylvania Law Review PENumbra*, April 2011.

The Nazi plunder didn’t start or end with art. Gold, jewelry, cash and dozens of other valuables were stolen or left behind when people fled Germany, Austria and other Nazi-occupied countries in fear for their lives – or when they were taken to the concentration camps. Many of the proceeds of those thefts wound up in Swiss banks, German banks and elsewhere.

For decades, survivors and their heirs were mostly thwarted in their efforts to have those assets returned. But during the Clinton administration, new settlements and funds were established that surmounted \$10 billion to resolve the claims of tens of thousands of survivors.

Art, however, was excluded because of the difficulty of appraisal, as well as the extraordinary amount of additional assets in question. Dispossessed art owners or their descendants were left to fend for themselves. They had to file lawsuits one by one.

In the 1990s, after studying languages and history at Karl Marx Universität in Leipzig, Germany, and obtaining her law degree from Georgetown University, Kreder worked at Milbank, Tweed,

Hadley & McCloy, a New York City law firm. She worked on Holocaust litigation, intergovernmental negotiations, WWII-era property claims and art disputes. She also did pro bono work on behalf of a group of nuns who were raped, tortured and murdered during the Salvadoran war in the 1980s.

The Holocaust litigation became a passion. She has contributed to books, signed onto litigation, wrote friend-of-the-court briefs, and spoken to dozens of conferences around the world.

In one of the more prominent cases she’s worked on, Kreder wrote and filed several motions and friend-of-the-court briefs in a lawsuit filed by the heirs to the late expressionist painter George Grosz against the Museum of Modern Art in New York.

Grosz fled Nazi Germany in 1933, leaving behind several paintings with his dealer in Berlin. Three of those works eventually found their way into the Museum of Modern Art in New York: Hermann-Neisse with Cognac, Self-Portrait with Model, and Republican Automaton. Kreder’s motions dealt with, among other things, the interpretation of the

statute of limitations rules in light of U.S. government policy that encourages settlement of such claims. Courts ruled, however, that the lawsuits were filed too late. The U.S. Supreme Court eventually decided against hearing the appeal. Kreder’s work is unique, said Raymond Dowd, a lawyer with Dunnington, Bartholow & Miller in New York. His firm has represented dozens of Holocaust era survivors and heirs, including the Grosz heirs.

Dowd said when he saw Kreder’s work, he reached out to her. Her research included an empirical approach to looking at how and whether museums were returning stolen artworks and whether they were working with the families to resolve the issues.

“She really is unique in terms of the research she’s conducted in this area,” he said. “She has been a pioneer in compiling the case law and analyzing it in ways that no one else has really looked at.

“For example, she’s compiled a chart on how litigations have been resolved in the United States. And the charts contain an analysis of how the litigations were resolved. Her findings are at odds with many of the claims of the museum community regarding their willingness to work with people who were despoiled during the Holocaust.”

It is important work, even 67 years after the end of World War II, Dowd said, pointing out the millions murdered in the Holocaust. Many lost valuable property, including art, and much of it was never returned to their estates and their heirs.

“Kreder is discovering that, at least in the art field, that victory of ours just hasn’t been realized,” Dowd said. To the extent, he added, that the people whose art was stolen by the Nazis win back their property, the Allied victory will be more complete.

**JENNIFER A. KREDER** is a professor of law and associate dean for faculty development. She has been at NKU since 2004.  
**EDUCATION:** J.D., Georgetown University Law Center, 1998, B.A., University of Florida, 1994.

# Giving an original thinker her due

By Greg Paeth

Simone de Beauvoir, the iconic French philosopher, novelist and feminist, never fully embraced her rightful position as a leading intellectual of the 20th century, and some arbiters of literary and philosophical history have been content to oblige the lack of recognition.

Dr. Barbara Klaw, a professor of French in Northern Kentucky University's Department of World Languages and Literatures, has been working to set the record straight.

The effort dates back some 25 years to when she began research on her doctoral thesis in French literature, "Men, Women, Power and Narrative in the Novels of Simone de Beauvoir," at the University of Pennsylvania. Klaw became convinced that de Beauvoir – for reasons that have baffled scholars for decades – rarely acknowledged that she was capable of original thought or intellectual breakthroughs in her philosophy, novels, essays and multivolume autobiography.

That was just the beginning, and the work continues. Klaw used a spring 2012 sabbatical in part to work on a translation of de Beauvoir's notebooks dated 1926-28. Six years ago, Klaw was one of the editors as well as the annotator, transcriber and translator of the first volume of *Simone de Beauvoir: Diary of a Philosophy Student, 1926-27*, which was based on handwritten diaries. "It hadn't been transcribed at all. I'm one of the first ones that got to the library and said, 'I want to read this manuscript,'" she said.

During her work on the diaries, Klaw wrote another book about the writer,



*Simone de Beauvoir (left), shown here in 1983, once said of her life, "I tore myself away from the safe comfort of certainties through my love for truth – and truth rewarded me."* Associated Press photo

*French Professor Barbara Klaw (right) signed copies of her annotated translation of Simone de Beauvoir's diaries at a local bookstore. Klaw's scholarship on de Beauvoir has made her one of the world's experts on the influential philosopher, novelist and feminist.*



*Beauvoir's Paris*, which was published in 1999.

Klaw and other scholars are convinced that de Beauvoir, for a variety of complex reasons, routinely credited much of her thought to her longtime companion Jean-Paul Sartre, who is generally accepted to be the foremost proponent of existential philosophy and one of the giants of Western thought in the last century. Klaw began her research shortly after de Beauvoir died in 1986, at a time when many scholars and critics dismissed her as a second-rate talent and thinker.

"She was still being considered by most to be Sartre's mate, and most scholarship of that time still stated that she was just a weak imitation of him, disseminating his ideas, and that she never had an original idea of her own in her life," Klaw said, adding with palpable frustration: "And believe me, she was one of the people who was promoting this picture.

"If you read her autobiography, it's like she never thought anything on her own until she met Sartre. Kind of strange, you know, because there's all kinds of

scholarship, including some of my own, nowadays to prove that that's not at all how it worked and hypothesizing why on earth would she play that game."

Theories are emerging about why she adopted the subservient role. "Current thought on that is that...no one would have listened to a female philosopher at that time. It would have been really hard to disseminate her own ideas had she announced them as her own," Klaw said. De Beauvoir published from roughly the early 1940s through the late 1970s – a time, Klaw said, when France was "still a man's world" and well behind the United States on certain women's rights issues.

From Klaw's point of view, there's no question that de Beauvoir's work may have influenced Sartre just as he had influenced her over the course of their 50-year relationship. "She read and edited everything he wrote, but he didn't do the same for her," said Klaw, who believes that it's difficult – in a relationship like theirs – to determine who had an idea first.

Just as she believes Sartre's influence on de Beauvoir has been overstated, Klaw

*“If you read her autobiography, it’s like she never thought anything on her own until she met Sartre. Kind of strange, you know, because there’s all kinds of scholarship, including some of my own, nowadays to prove that that’s not at all how it worked and hypothesizing why on earth would she play that game.”*

— NKU French Professor Barbara Klaw on Simone de Beauvoir’s inclination to discount her important contributions to the intellectual canon of 20th-century thought



*French writers and philosophers Jean-Paul Sartre and Simone de Beauvoir were constant companions. Here, they are leaving a Paris police station in 1970, where they were taken for distributing a banned publication of a Maoist movement.*

Associated Press photo

believes the reverse is true with modernist British novelist Virginia Woolf. In July, Klaw offered her theory about the Woolf-de Beauvoir links in Oslo, Norway, where she delivered one of the keynote addresses at the annual conference of the Simone de Beauvoir Society, a worldwide group of de Beauvoir enthusiasts. Her presentation, “Reading Simone de Beauvoir through Virginia Woolf,” examined what Klaw considers the profound impact that Woolf had on de Beauvoir, who had acknowledged that she had read Woolf’s work, disagreed with some of it and – in Klaw’s word – “underplays” its influence on her own writing.

Klaw said de Beauvoir’s silence about

Woolf’s influence almost became an acknowledgement of it. In the fourth volume of her autobiography, de Beauvoir goes out of her way to distinguish herself from Virginia Woolf. “When I read that comment,” Klaw said, “I was like, wait, this is telling us something here. Otherwise, why would you take the time to tell me that you’re not this other person if you’re not worried about it?”

**BARBARA KLAW** is a professor of French in the Department of World Languages and Literatures. She has been at NKU since 1990.

**EDUCATION:** Ph.D., University of Pennsylvania, 1990, M.A., University of Pennsylvania, 1985, B.A., Northern Illinois University, 1979.

## Hand puppets and French dialogue lit a passion for humanities

The spark that lit Barbara Klaw’s interest in French writing seems to provide a good argument against those who want to slash education budgets with a laser-like focus on the basics and the elimination of any classroom “frills.”

When she was growing up in the middle-class Chicago suburb of Rolling Meadows, an experimental language program at her grammar school used hand puppets to conduct French dialogues. The future professor was just 7 or 8.

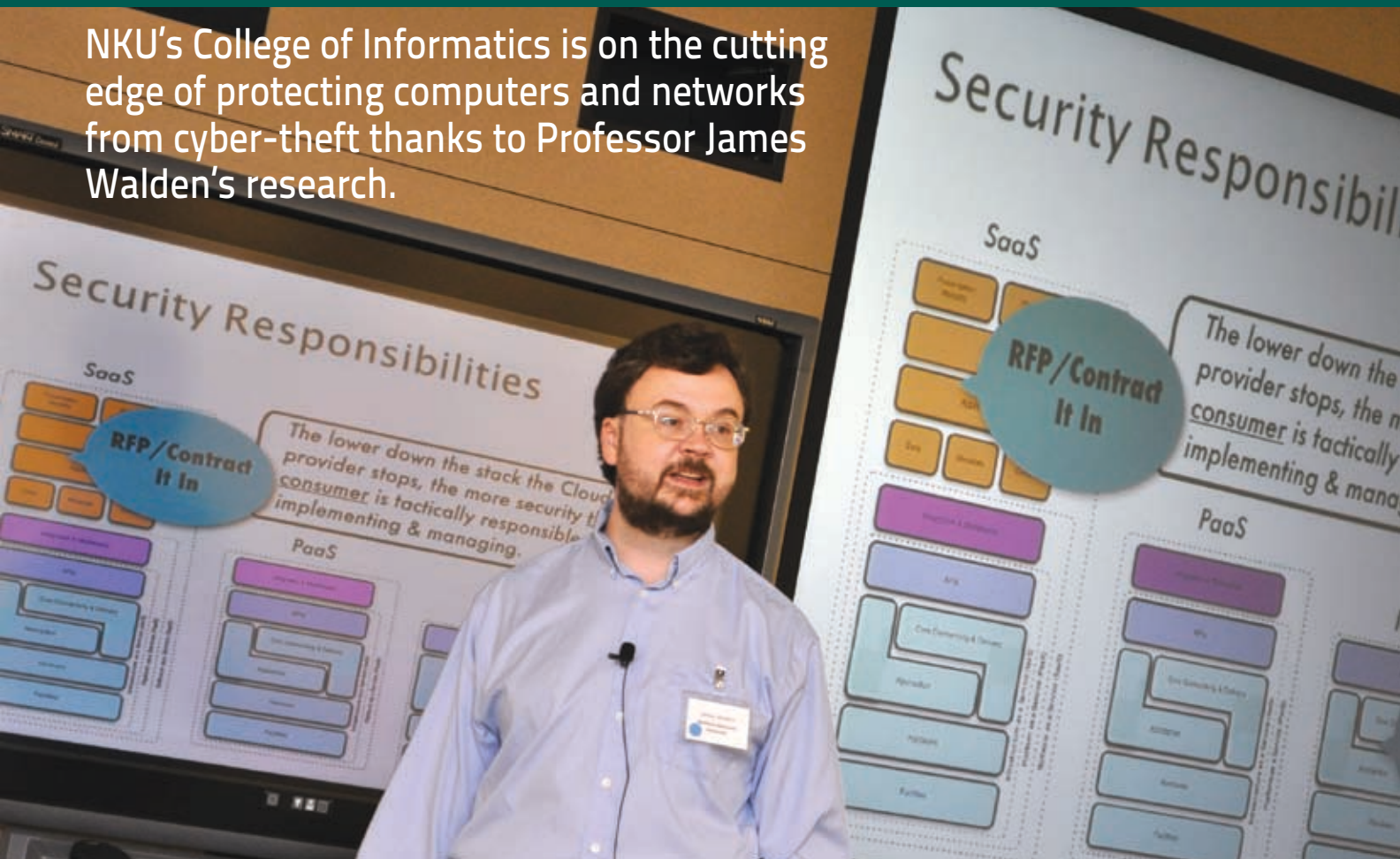
“And the thing that I loved – I have to be honest – it’s the way it sounded,” Klaw recalled. “I wasn’t so concerned about what they were saying. It was music to my ears.” She continued her language studies in high school and at Northern Illinois University, Northwestern University and finally at the University of Pennsylvania.

Today, she balances teaching, research and writing, continuing to work on the translation of de Beauvoir’s notebooks as well as her research on Woolf and de Beauvoir. She’s also developing coursework for a class on Paris in the 1920s.

Since joining the NKU faculty some 22 years ago, Klaw has been involved in a long list of university committees and organizations and has been recognized with a faculty excellence award for scholarship in 2007 and has been nominated every year since 2008 for the Frank Sinton Milburn Outstanding Professor Award, the top honor for a faculty member. She also has been awarded more than a dozen competitive grants.

As a teacher, she knows there are no certainties from one semester to the next and that what works with one group of students won’t necessarily work with others. “It’s kind of like a three-ring circus. Every time you come up with a new juggling act, you have to see how it works,” she said.

NKU's College of Informatics is on the cutting edge of protecting computers and networks from cyber-theft thanks to Professor James Walden's research.



# Staying ahead of the hackers

By Feoshia Henderson Davis

There is a dizzying array of websites asking for your personal information, exposing heavy Internet users to dozens of accounts that store birth dates, email addresses, credit card and bank account numbers, and pictures of our families.

We may expect that information to be protected, but we should beware. Safeguards vary widely, offering computer hackers opportunities to expose vulnerabilities in a site's security, often with ill intent.

A Northern Kentucky University professor is training the next generation of web security guardians, armed with the latest real-world tech research to combat hackers trolling for personal information.

Dr. James Walden, associate professor at NKU's Department of Computer Science in the College of Informatics, returned to the university for the fall semester after a year-long sabbatical at KU Leuven, a Belgian university. There he measured the security of mobile web applications for Android devices and studied

techniques to predict the long-term security of those applications.

"Working in mobile application security is a new area for me," Walden said.

"We looked at open-source Android applications, searching for vulnerabilities in their source code. Some of the vulnerabilities discovered would enable an attacker to obtain personal information or take over an app entirely and use a phone as a listening device."

Walden worked with colleagues at KU Leuven and students at NKU to test mobile applications currently on the market, to help make them safer and to find potential problem areas in the future. "After finding the vulnerabilities, we built predictive models to find where you would be likely to find vulnerabilities in an application's source code," Walden explained.

The models will help developers improve mobile web application security.



*James Walden's job in the classroom is to lead NKU computer science students through the complex world of cybersecurity for computers, smart phones and networks. For all the technical aspects of anti-hacking methods, Walden reminds students: "It's important not to leave out the human aspect in hacking."* NKU photo

Having a web account hacked can be merely annoying, as happens when a hacker sends out spam emails from your account. But it can also be downright dangerous, as happens when a hacker opens a bank account with your stolen information.

Web hacking is a continuing part of Internet culture and even large, mature sites can be attacked. In the first half of 2012 alone, a host of major sites were hacked, exposing user data. Among those were professional networking site LinkedIn, major credit card processor Global Payments and online dating site eHarmony. It's difficult to determine the long-term damage of a data breach, but the potential for fraud is massive.

In 2011, a hacker group known as Lulzsec hacked the CIA website and an FBI affiliate website, obtaining user email addresses and passwords. That same year, Gadgets and Gizmos, an online tech publication, estimated that 73 percent of Americans had been subject

to a cybercrime (most originating from hacking).

As individuals, we don't make hackers' work difficult. Social networking sites have made it even easier to share malware via email attachments or web links that can easily take over home and work computer systems.

"It's important not to leave out the human aspect in hacking," Walden cautioned.

Walden's work in Belgium builds on his nearly two decades of experience working in software security, including working at Intel and Carnegie Mellon University. His experience includes designing and implementing secure software as well as researching software security and security metrics.

Walden brings his research back to NKU's College of Informatics, where he teaches a broad variety of security courses including advanced network and system administration, computer security, systems architecture and secure software engineering. He came to NKU from the University of Toledo just as the College of Informatics formed in 2005. "I thought it was an exciting, new opportunity to take a broader and new look at information sciences," he said.

This year, he is teaching graduate-level classes in which students learn techniques for designing software with fewer potential security flaws.

Cyber security is a dynamic area of IT study, one that changes and evolves along with technology. More people, for example, are writing malware to hack into smart phones. "I think we'll see more attacks on applications in the mobile application world," Walden predicted. "Ninety percent of web applications have some kind of vulnerability that can be found in a week."

**JAMES W. WALDEN** is an associate professor of computer science. He came to NKU in 2005.  
**EDUCATION:** Ph.D., Carnegie Mellon University, 1997, M.S., Carnegie Mellon University, 1994, B.S., Miami University, 1992.

## NEXT UP: Trying to put NKU on the information security map

In addition to his research and classroom work, Dr. James Walden is part of a group trying to get NKU designated as a National Security Agency Center of Academic Excellence.

This designation, which could come as soon as the summer of 2013, would identify the university as a place for top information-security education.

Kentucky is one of eight states without an NSA center, providing NKU with the chance to be the first in the commonwealth.

"This would really put us on the map in terms of information security and up our ability to attract students," Walden said. "There is a huge shortfall in the number of people who have information security skills. Those with the skills are in very high demand."



*Among the world's more infamous hackers was Gary McKinnon, "the Pentagon internet hacker," whose battle in the United Kingdom against extradition to the United States has been a cause celebre. His defenders suggest he should be hailed as a hero for exposing the Pentagon's cyber vulnerability.* Associated Press photo



# Photos give at-risk students a voice

A picture is worth 1,000 words ... and perhaps a reduced high-school dropout rate

By Stacey Barnes

Kids don't always want to talk about their problems with adults. They may feel adults won't understand or won't listen. But in the age of digital cameras, smart phones and social media, kids do like to snap pictures. What if there were a way for teenagers to communicate with adults through pictures?

Turns out, there is.

PhotoVoice is a technique that combines photos and interviews to break down the walls that may block honest communication. Its premise is simple: Photographs are an icebreaker. Think about new parents showing off the photograph of a son or daughter at some seminal moment – maybe the first day of school or a stellar moment in sports. It's a conversation starter.

Conceived and developed in the 1990s, PhotoVoice is being introduced in our region by Northern Kentucky University's Dr. Dana Harley, an assistant professor in the Counseling, Social Work and Leadership Department. Last year, she piloted a program with the Kenton County School District to examine reasons why students drop out of high school. Now, Harley and an NKU team are expanding the project, going from 15 students last year to about 100 over the next two years. They'll work with students at two Kenton County schools: Scott High School in Taylor Mill and Dixie Heights High School in Crestview Hills, where the pilot was conducted.

"PhotoVoice takes out the adult piece. It provides a bird's-eye view of how kids see the world around them. It gives them a voice," Harley said.

*PhotoVoice "provides a bird's-eye view of how kids see the world around them," explains Dr. Dana Harley. The NKU PhotoVoice team includes (above, left to right): Dr. Willie Elliott, Harley, Dr. Karen Tapp and Dr. James Canfield.*

NKU Photo/Timothy Sofranko



*For a Columbus, Ohio, PhotoVoice project on "hope," a 13-year-old girl took this picture and captioned it: "Have a meal on the table for your family."*

## Connecting NKU research to the community's needs

Three grants totaling \$57,500 were awarded by NKU in 2012 to faculty members conducting community programming and research. Called University-Community Partnership Grants, they are awarded to full-time faculty who establish partnerships with local government agencies or nonprofits to address northern Kentucky's educational, health, social or civic needs.

While the grants are made to faculty members, each project also must include NKU students in the work, often as co-researchers. The idea is to mentor students in research skills while also providing direct community benefits.

"This program illustrates the ideal of being a bridge builder between the university and the community," said Dr. Jan Hillard, associate provost for research, graduate studies and regional stewardship.

In addition to the PhotoVoice project, two other projects were funded this year:

• **DR. MIRIAM STEINITZ KANNAN**, a professor of biological sciences, is receiving \$25,000 to expand the Ohio River STEM Institute. The expansion will focus on reaching minority students. The institute uses the Ohio River as a field classroom to teach biology and chemistry. The grant also will fund the expansion of River on the Web (ROW), a website with water quality information and teacher resources. A smartphone application will give students in the field a way to feed data to the site, where it can be used to develop classroom lessons.

• **DR. GREG HATCHETT**, a counseling professor, is receiving \$7,500 to survey the extent of human trafficking in our region. He'll work with the NKU honors program to gather information to guide area agencies in improving services in this critical arena. Students will survey health clinics, police and other agencies as part of an effort to document the extent of human trafficking here.

She has also described it more formally to colleagues nationally like this: "PhotoVoice is a cutting-edge research method aimed at uncovering issues, concerns, constructs, or real-life experiences of those who have historically been marginalized or oppressed."

Although located in Kenton County's prosperous suburbs, Dixie Heights and Scott are not high schools with homogenous enrollment. Some students come from dire economic circumstances and, because of that, their risk of quitting high school when turning 16 is higher than average. Jan Ising, the school district's homeless education coordinator, identified homeless and other at-risk students. Harley and her team then matched each high-school student with an NKU student pursuing a master's in social work to act as a mentor.

The goal was to ask the high-school students to identify obstacles to staying in school through graduation. The information collected would then be used to design programming to clear those obstacles and, in the end, lower dropout rates (Dixie's dropout rate was 1.5 percent in the 2009-10 school year, slightly higher than the district rate of 1.2 percent and better than the state rate of 2.2 percent; Scott's was 2.0 percent).

In a more traditional approach, the mentors might simply survey or interview the high-school students, who may clam

up or answer perfunctorily. PhotoVoice offers the chance for richer, more honest answers. The high-school students are given a camera and asked to take pictures representing obstacles in their lives to staying in school.

Those images catalyze conversations. One student's picture was of himself sleeping. Why? Because he felt sleep-deprived and often tired when at school. The stresses of his home life (drugs and family members in prison, for example) were at the root of the problem. What was happening at home kept him up at night, and left him exhausted before the school day even began. It's the photograph of him sleeping that got the young man talking, bringing his burdens to light.

A \$25,000 award from NKU's University-Community Partnership Grant program is underwriting the PhotoVoice project. The grants are designed to encourage campus-community collaborations, bringing the expertise and talent of NKU's faculty and students to bear on regional challenges including improving elementary and secondary education.

Caroline Wang was at the University of Michigan and Mary Ann Burris at the Ford Foundation when they conceived PhotoVoice, applying concepts from participatory photography – a 1960s movement to use cameras for grassroots social action. In an early application, they used PhotoVoice in the Yunnan province

## Benefits at three levels

NKU's PhotoVoice project with Dixie Heights and Scott high schools has benefits to the high-school students who are the mentees, the NKU Master of Social Work students who are the mentors and the Kenton County School District:

- **MENTEES:** Their voices are heard. Surveys, formal interviews and other traditional methods of collecting information from at-risk high-school students can be stymied. PhotoVoice opens the lines of communication.
- **MENTORS:** NKU's Master of Social Work students who serve as the mentors get real-world experience in therapeutic social work, applying research techniques on one end and helping analyze data they've collected on the other end. At the end of the school year, they will also make a presentation at NKU's Celebration of Student Research and Creativity event on campus.
- **SCHOOL DISTRICT:** District officials want to see the high-school dropout rate go down. Armed with the analytical results from PhotoVoice, they can devise strategies for addressing the obstacles to school attendance identified by the NKU team.



of China as they sought a community voice in community development. Since then, researchers and others have adapted PhotoVoice to other uses, including the social-work application NKU is trying. Willie Elliot, a member of Harley's team working on the Kenton County project and also associate professor in counseling, social work and leadership, said PhotoVoice gives the high-school students the power to tell their stories.

"Clinically we expect certain answers. PhotoVoice breaks through that by being therapeutic without being clinical," Elliott said.

Students make decisions about what they see as problems instead of someone telling him what the problems are. As Harley put it: "We work with them instead of on them."

Dave Merriss, a Master of Social Work student who mentored a student earlier this year in a trial run of the program, said PhotoVoice helped his mentee communicate more freely.

"I didn't realize the impact we would have on each other," Merriss said. "He had a lot of negatives in his life. My role was to be a listener, to offer encouragement and to be a reflective sounding board."

Merriss found he became a cheerleader for his mentee because he learned so much about his life and his experiences. He learned that his mentee was a teenage father who wanted a better life for his daughter. Merriss said some days his mentee was late to school because he was trying to get his daughter to preschool.

"It was not a clinical response," Merriss said. "It was a bridge that allowed him to talk about things he might not have shared without using PhotoVoice."

**DANA HARLEY** is a second-year assistant professor in the Department of Counseling, Social Work and Leadership. She specializes in child and adolescent mental health and developmental issues and has more than 10 years of clinical social work practice experience.

**EDUCATION:** Ph.D., The Ohio State University, 2011; licensed independent social worker-supervisor; M.S.W., University of Cincinnati; B.A., Wilberforce University.

## In memory of Dr. Heather Bullen By Kristi Haik



*"She taught her students to enjoy science," Dr. Kristi Haik (pointing) said of Dr. Heather Bullen (seated). They were frequent research collaborators and close friends.*

No one exemplified Northern Kentucky University's core value of "placing learners and their learning at the center of all that we do" than Dr. Heather Bullen. In every aspect of her work, she made sure students were central, whether in her service to NKU and the community, in the classroom or in her research lab.

Heather was a key leader in the two grants devoted to improving science, technology, engineering and mathematics (STEM) education and research at NKU. Her work on these programs was critical in developing a community for STEM students and faculty, improving retention for STEM students and providing more opportunities for them to prepare for their careers. Dr. Bullen believed in making science, especially chemistry, more accessible, whether it was through outreach to the community or one of her pet projects "Girls in Science."

Heather truly loved teaching and was an enthusiastic and exceptional professor, teaching at least three senior-level chemistry courses each semester. Students loved her and would take as many classes from her as they could because of her passion for teaching. She made difficult concepts like those in analytical chemistry understandable,

by making learning fun in the classroom as well as the lab. Whether it was her outgoing personality, her ever-present smile or simply playing the latest music throughout the lab courses, she taught her students to enjoy science.

Heather was devoted to involving undergraduate students in her research. The first day I met her she told me that a major reason why she came to NKU was because of the university's commitment to undergraduate research. Heather involved at least ten students each year on three different research projects, taking them to national and international conferences to present their work as well as including them in the publishing of research.

Her students are some of the most sought after students in her field. She strove for greatness in all of her endeavors and those who worked with her were better because she touched their lives.

Heather's zest for life, her infectious smile and positive attitude made those whose lives she touched better and we loved her for that. Our community has been truly blessed for having her and she is and will be missed greatly.

**Kristi L. Haik, Ph.D.**, is interim director of the Center for Integrative Natural Science and Mathematics (CINSAM), and an associate professor in NKU's Department of Biological Sciences.



NKU nursing student Michele Burwinkel of Fort Wright, Ky., explains her poster, one of many on display in April when the 2012 nursing student research posters were unveiled in the Student Union. The posters summarize research about nursing and medicine. The posters were later made available to area hospitals and clinics as educational material for their nursing staffs. NKU Photo/Timothy Sofranko

## From the research lab to bedside

NKU is leading the way in evidence-based nursing

By Karen Meiman

Lead was a routine component of paint and gasoline for much of the 20th century. Added to gas, it silenced engine knock. Added to paint, it improved durability and adhesion.

But when children were exposed to it, lead suppressed brain development and threatened damage to kidneys and nervous systems. Painted toys, cribs and nursery walls guaranteed exposure, as did car exhaust. A public outcry arose, and by the 1970s lead was banned in gas and paint.

So the stakes were high but the battle

won. Or so the public health community thought.

“We really did think, ‘OK, we’ve got this under control,’” said Kim Dinsey-Read, an assistant professor of nursing and director of the accelerated Bachelor of Science in Nursing program in Northern Kentucky University’s College of Health Professions.

Subsequent research told a different story. Even low levels of lead in a child’s bloodstream could diminish IQ and pose other health risks. That knowledge intrigued Dinsey-Read and her colleagues. To them, the gap between what researchers knew and what was being

applied in the real world of public health seemed too wide.

Enter the Northern Kentucky Nursing Research Collaborative, formed in 2006 to build a bridge between researchers and practitioners so that new findings could be put to use quickly and effectively.

“At the time, hospitals were searching for those in academics to serve on their research councils. Hospitals had the clinical expertise, while universities had the academic expertise,” recalled Judi Godsey, a former NKU nursing professor who is now at Xavier University. She was instrumental with Dinsey-Read in setting up the collaborative.

## Partnering to promote research

- The Northern Kentucky Nursing Research Collaborative formed in 2006 to link clinical resources of local hospitals and medical practices with the academic resources of NKU.

- The partners include NKU's Department of Nursing, the Rho Theta chapter of Sigma Theta Tau (the international honor society of nursing), St. Elizabeth Healthcare, Riverhills Healthcare, the Northern Kentucky Independent District Health Department, HealthPoint Family Care and others.

- A \$68,971 grant in 2007 from NKU's University-Community Partnership Grant program launched the collaborative, which has expanded its work with a two-year project continuation grant from the George Renaker, M.D., Charitable Foundation in the amount of \$45,870 in February 2008.

- Two NKU professors, Kim Dinsey-Read and Judi Godsey (now at Xavier University), were instrumental in launching the collaborative.

- The goal of the collaborative is to introduce "the research process to novice nurse researchers, and provide advanced research opportunities for more experienced nurses. Structured workshops, seminars, and professional meetings focus on the utilization and application of research within our own community by Registered Nurses and NKU nursing faculty and students."



*Lead paint in children's toys remains a problem. In September, the U.S. Consumer Product Safety Commission recalled the Hong Kong manufactured Captain Cutlass Toy Pirate Pistols because its surface paints violated the federal lead paint standard.* U.S. Consumer Product Safety Commission photo via AP

Lead exposure became the group's first project. Nearly 8,000 northern Kentucky children were at risk of lead poisoning by the collaborative's reckoning. With the community need evident, the Lead Exposure Control Initiative was born.

Dinsey-Read already was well aware of the risks posed by lead for children. She had written a paper on the topic in 2004 and relayed the dangers – as they were known to researchers – in stark terms: "Children readily absorb up to 50 percent of the lead they are exposed to, as contrasted to adults who absorb 10 percent of the lead exposure. A single paint chip the size of a dime can have 50 to 200 mg of lead in it. Three of these paint chips ingested by a child would equal 1,000 times the amount of lead allowed for an adult daily."

It was that kind of knowledge that the Nursing Research Collaborative set about to disseminate, with workshops for nurses and other healthcare professionals and pamphlets distributed to schools urging parents to get their children tested for lead.

"The pamphlets helped parents in a visual way to understand the importance of

testing children," said Andrea Ashcraft, a Head Start employee who worked with Dinsey-Read on the project. Getting children tested early is paramount, because the cognitive impairment caused by lead is irreversible. "I think the brochure prevented a lot of damage to children," Ashcraft said.

Among the collaborative's partners was Rho Theta, NKU's chapter of Sigma Theta Tau International, an honor society for nursing. The Rho Theta students worked closely with the Northern Kentucky Independent Health Department (another of the collaborative's partners) to reach out to families with children whose blood levels of lead were high enough to be of concern according to the latest research but not high enough to qualify for state-directed home interventions. Working mainly in inner-city ZIP codes where lead poses the most risk, the students hosted "lead ed" classes and trained parents in how to use home lead sampling kits. In 2008 and again in 2009, Sigma Theta Tau honored Rho Theta with its International Research Advancement Award for the chapter's collaborative work in the community on lead.



*“The community benefits because more nurses are going into the field knowing how to do research. They are more interested in research and more likely to share the research with others.”*

— Professor Kim Dinsey-Read

While the formal part of the Lead Exposure Control Initiative has run its course, the research and community tools developed from it – including the pamphlets, a website and a database – remain in use by Head Start and others. And lead remains part of Dinsey-Read’s own research, with her current focus on treatment. “I’m not finished with lead,” she said, even as she described other paths where her passion for evidence-based practice has taken her.

The efforts around lead established a model for how the Nursing Research Collaborative might address other community health issues, including, for example, childhood obesity and adult cardiac care.



*The 70 or so research posters produced by NKU’s nursing students are part and parcel to a teaching approach in the university’s nursing programs. As lecturer Traci Freeman put it: “Students don’t have to go far into their classes before they are exposed to*

“The biggest thing to come out of the nursing collaborative is the emphasis on evidence-based care,” said Tina Volz, director of nursing for St. Elizabeth Healthcare.

St. Elizabeth has been a partner with NKU in the collaborative from the start. As northern Kentucky’s largest provider of health care, the hospital group brings the strength of its size, which helps both in marketing the collaborative’s workshops and in providing professionals to mentor NKU’s nursing students, who learn early in their studies that evidence-based care is the gold standard in nursing today.

The trend toward evidence-based care is national as nurses and nursing educators have made a concerted effort to transfer research from the lab to the bedside.

Research suggests everything from where to place a blood pressure cuff on the arm for the most accurate reading to how to decrease waiting time in the emergency room so that stress doesn’t worsen a patient’s symptoms. NKU has made a point of being on the leading edge of putting an emphasis on research in the nursing curriculum.

“Students don’t have to go far into their classes before they are exposed to research,” said Traci Freeman, a lecturer in the Department of Nursing. “In the first semester, they are introduced to research. Everything they learn to do is backed by evidence right down to what side of the stethoscope to use.”

Entering its eighth year of operation, the Nursing Research Collaborative is now well established as a key agent for

transferring knowledge from researchers to clinicians – and NKU students are given a leading role. One tool is the use of student posters where research is summarized. A poster contest, hosted by the collaborative, has grown from 28 entries to more than 70 – and the posters aren’t retired after the contest. They go on display where nurses can learn from them. Topics have included medication discharge planning, barriers to advanced education for nurses, documenting pressure ulcers, decreasing lab failures and improving mouth care.

“In nearly every hospital in northern Kentucky, you will find posters detailing the results from the latest research. That’s a great way to communicate and educate others,” Dinsey-Read said.

The next step for the collaborative is a writing workshop that will teach students and nurses how to write articles that share their insights into evidence-based care.

“In the end, the community benefits because more nurses are going into the field knowing how to do research. They are more interested in research and more likely to share the research with others,” Dinsey-Read said.

**KIM DINSEY-READ** is an assistant professor of nursing who has been on the NKU faculty since 2005. She also is the director of NKU’s Accelerated Bachelor of Science in Nursing program.

**Education:** Ph.D. candidate, University of Hawaii; M.S.N., Northern Kentucky University, 2006; B.S.N., NKU, 2004; R.N. Health Science Diploma, St. Lawrence College, Ontario, Canada, 1986.

*Dr. Lili Ma in her chemistry lab at NKU, where she uses microwaves to speed the synthesis of a cancer treating compound found naturally in blue passion flowers.* NKU Photo/Timothy Sofranko



## Synthesizing isoflavanones

Sometimes Mother Nature needs a little help. The blue passion flower produces a powerful anti-cancer compound. But it can't produce as fast as Lili Ma's lab.

By Kevin Osborne

**A**lthough they only became prevalent in kitchens starting in the mid-1970s, it's hard to imagine household life today without microwave ovens to pop the corn and warm the leftovers.

Now, in what promises to be a more consequential application, microwaves are being put to a new use by cancer researcher Dr. Lili Ma, an assistant professor in Northern Kentucky University's Department of Chemistry.

Ma and her colleagues are using microwave radiation to heat compounds and trigger chemical reactions needed to synthesize phytoestrogen, a type of estrogen produced by plants and

commonly used to treat breast cancer and ovarian cancer. The synthesized phytoestrogen mimics the structure of chrysin, a natural compound found in blue passion flowers.

"These types of natural compounds have been noted for their beneficial qualities for some time," said Ma, who added that such compounds – known as isoflavanones – have also been used in research involving their potential anti-aging and antiviral properties. Their other benefits include reducing the risk of heart disease and stroke and easing postmenopausal symptoms.

To understand the potentially far-reaching consequences of Ma's research, one must first understand how breast cancers and

ovarian cancers currently are treated.

Because some breast and ovarian tumors have been known to grow and spread due to naturally occurring estrogen in women, a common treatment involves lowering estrogen production at the site of the cancer. This is done using non-steroidal aromatase inhibitors, or NASIs, a type of drug that selectively blocks the conversion of androgen into estrogen in women's bodies by binding to the enzyme that triggers the change.

The chemical structure of isoflavanones resembles the chemical structure of human estrogen, which allows them to temporarily interfere with the functioning of human estrogen levels.

There are synthetically manufactured NASIs available, but their use typically entails more side effects for patients, such as osteoporosis. “These drugs are very new. No one knows their long-term side effects,” said Ma.

Some oncologists and patients prefer the use of drugs that have been made from natural products compounds, which often have a less adverse impact. The problem with that approach, however, is the laboratory process used to increase the potency of the isoflavanones for the naturally derived drugs can be difficult and time consuming. Ma’s research helps solve this dilemma, simplifying the process.

Under the traditional method, structural modifications are made by heating the isoflavanones at 150 degrees Fahrenheit for a period of 24 to 36 hours in order to achieve the desired chemical reaction. This process also uses toxic reagents that spur the chemical reaction.

For the past two years, Ma has been using a microwave reactor, nicknamed “Discover,” to try an alternate method. By heating the isoflavanones with microwaves, the production time is significantly reduced to only 10 minutes and some of the toxic reagents are eliminated. The new method increases the production of the compounds from roughly two per week to five per week.

“It gives us comparable results,” Ma said. “Not identical, but you save a lot of time, and it makes them more readily available.” Additionally, the new method is more ecofriendly, saving energy and with a cleaner chemical reaction.

The work Ma has completed has given her reason for optimism. “From my own experience, I know microwaves work very well in synthesizing these compounds,” Ma said. “I think the future looks promising for this effort.”

**LILI MA** is an assistant professor of chemistry. She has been at NKU since 2009. She leads a team of five researchers at NKU and also teaches several chemistry courses.

**Education:** Ph.D., Brown University, 2007, M.S., Nanjing University, 2002.

# Celebrating Student Research

## With faculty mentors to guide them, NKU undergraduates are active researchers

*While much of the research at NKU is accomplished by our faculty, our students are in the library and labs, too. An annual Celebration of Student Research and Creativity highlights some of the work each year. The 2012 celebration held in April featured 330 students. Here is a sample of their work:*

### Building a Private Cloud with Eucalyptus

Student: **Austin Brashear**

Faculty sponsor: **Wei Hao, Computer Science**

**Abstract:** Public cloud is an emerging computing platform that is increasingly popular. However, the big concern about the public cloud is security. People do not want to store confidential data or run proprietary applications in the public cloud. Therefore, we build a private cloud to address the security concern of the public cloud. Our project’s goal is to create a private cloud infrastructure with API-level compatibility with Amazon’s EC2 using free software which might be used in a classroom environment for creating and destroying virtual machines as needed by the students. Our cloud infrastructure is based upon Ubuntu Linux and Eucalyptus.

### Population dynamics of amphibians and reptiles at a rejuvenated brownfield

Student: **Mitch Mercer**

Faculty sponsor: **Richard Durtsche, Biological Sciences**

**Abstract:** The Lafarge Gypsum Plant is rejuvenating a brownfield to a wetland; however, soil contaminants from industrial waste may retard reclamation rates. As wetland species, amphibians are good sentinels of environmental health because many life processes in their moist skin are sensitive to contaminants. We assessed the amphibian and reptile species diversity and abundance at the Lafarge site compared to the nearby St. Anne Wetland natural area. Specimens were collected, marked, and re-released. Field recorders monitored frog calls of various species. Results show Lafarge’s site may sustain life for some, but not all expected herpetofauna species found within a wetland habitat.

### Block Cipher Construction

Student: **Joel Belcher**

Faculty sponsor: **Chris Christensen, Mathematics/Statistics**

**Abstract:** In 1997, the U.S. Government announced that it wanted to replace the aged Data Encryption Standard (DES). Cryptographers submitted fifteen ciphers for consideration as the Advanced Encryption Standard (AES). At the end of a five-year competition, in 2001, Rijndael was selected as the winner from the five ciphers that survived into the final round. In addition to Rijndael, the finalists were Twofish, MARS, Serpent, and RC-6. This project constructed simplified versions of the four runner-ups. In this presentation, I will present the encryption algorithm for a simplified RC-6 encryption algorithm.

### Antimicrobial effects of dental composites containing silver nanoparticles

Student: **Marilyn Henry**

Faculty sponsor: **Heather Bullen, Chemistry**

**Abstract:** Silver nanoparticles have been combined with various dental composites in an effort to create an effective composite material that may minimize the growth of bacteria beneath a dental filling. The antimicrobial effects of silver can significantly minimize the risk of severe infections in the gums. Several different sizes and shapes of silver nanoparticles were combined with dental composites in order to synthesize a composite that is both antimicrobial and the color of human teeth. The effects of particle size and surface area on the antimicrobial response to *Pseudomonas aeruginosa* were evaluated with contact angle analysis and atomic force microscopy.

## Detecting and Disabling Keylogger Software

Student: Adam Howard

Faculty sponsor: Yi Hu, Computer Science

Abstract: Most keyloggers are software applications that are installed onto computers with the intent of monitoring and storing keystrokes that are input by a user. They can be used by malicious users to steal confidential information. Keystrokes can either be stored on a physical hard disk or transmitted to a remote location. This research studies ways to detect and remove unknown keylogging software. Since keyloggers by nature are hidden from the user, we study the mechanisms that they use to hide themselves and communicate with malicious users. Then we propose a general process for identifying unknown keyloggers.

## The Origin, History and Impact of the Ice Cream Legacy

Student: Matthew Stark

Faculty sponsor: Jonathan Reynolds, History and Geography

Abstract: Ice cream has won the hearts of many generations ever since the days of the Roman Empire and possibly the Persian Empire. The history of the ice cream legacy can be definitively traced back to Emperor Nero of the Roman Empire. However, the origin of its first creation is still controversial. This project discusses some of the debated origins of ice cream, its impact on society, and the processes of how it is made today.

## A Novel Approach to Delivering Wellness Programming to Seniors

Students: Donnie Poore, Jacob Curtis, Bethy Jaspers, Brian Gish and Sarah Mandhardt

Faculty sponsors: Renee Jeffrey and Gary Eippert, Kinesiology and Health

Abstract: Technology use among older populations is not consistent. This study will assess the benefits of delivering wellness content electronically on computers and iPads. Six presentations, each addressing a component of wellness, were developed using PowerPoint presentations and imbedded videos. Over five weeks, members of the Campbell County Senior Center watched the videos and answered a short survey. Analysis of the survey results will increase our understanding of the usefulness of these platforms in delivering wellness interventions in a senior population.

*“Collaborative scholarship with students provides faculty with an essential link between teaching and research/creativity that broadens pedagogy, opens fresh perspectives, and satisfies that most basic human urge to explore that which we do not fully understand.”*

— Dean Samuel J. Zachary, College of Arts and Sciences

## Design and Creation of a Coffee Roaster

Student: Hannah Hillger

Faculty sponsors: James Bohache and Brian Warner, Physics And Geology

Abstract: During a course with Professor Jodi Ferner, called “World of Coffee,” I discovered a new passion. The art of home-roasting is a growing trend – and I have hopped on board! In my quest to roast coffee at home, I found a niche in the market of home coffee roasters. As an engineering technology student, I decided to fill that gap. My honors capstone (and senior project for the MMET program) is to design and create an affordable roaster. I will also be performing some engineering analysis on the roaster, and hopefully filling a large gap in the home roasting market.

## Representations of the LGBT Community and Their Effect on LGBT Youth

Student: Katelyn Hayes

Faculty sponsor: Shauna Reilly, Political Science and Criminal Justice

Abstract: Popular culture plays a profound role in the construction of a population’s ideas and beliefs about a variety of groups,

impacting the way that members of these communities view themselves. This has held true for the LGBT community, particularly in recent years. This study examines several prominent examples throughout popular culture in order to determine how the LGBT community is portrayed and how that portrayal affects youths’ perception of the community and LGBT youth themselves.

## Texting while Driving in College Students: What’s Love Got to Do with It?

Student: Rachel Stevens

Faculty sponsor: David Hogan, Psychological Science  
Abstract: Our research shows that texting while driving (a) is a form of health and safety risk-taking behavior like smoking or driving while intoxicated; (b) is perceived as relatively safe; (c) usually involves communicating with a significant other; and (d) can sometimes cause a vehicular accident or near-accident. We will report a causal model showing how risk taking, risk perception, and the urge to communicate with a significant other sequentially determine the likelihood of an accident or near accident while texting.

## Supporting Research and Creativity at NKU

- NKU’s faculty and staff submitted 165 applications for grants from July 1, 2011 through June 30, 2012.
- Those totaled \$33,308,735.
- 122 grants were secured, totaling \$9,493,628.
- The average award was \$78,000.
- The largest was \$1.6 million.

Source: Office of Research, Grants & Contracts



Office of Graduate Programs and Research  
Nunn Drive  
Highland Heights, KY 41099

Nonprofit Organization  
U.S. Postage  
PAID  
Newport, KY  
Permit No. 2

# DISCOVER



<http://nku.edu/discover>