



# Momentum:

## Research & Innovation



COVER STORY

### NEW FRONTIERS IN ARCHAEOLOGY

*featured inside*

WHAT DO ARTISTS DO?

HELPING CHILDREN  
OVERCOME ANXIETY

LIVES IN THE BALANCE:  
PROTECTING OUR PLANET'S  
COASTAL COMMUNITIES

Spring | 2015



Welcome to the latest edition of *Momentum: Research and Innovation*, the magazine covering advances in scholarly activity and research at the University of Rhode Island. We are pleased to offer this platform to you to explore the activities of University of Rhode Island faculty, staff and students to expand knowledge in diverse areas of study. The magazine is meant to include stories about work and people involved in all the disciplines of study at the University over time. We are also including stories about how applied research can enhance the economic development of Rhode Island, the United States and the world. We hope that you will enjoy this issue and also come back to examine future editions. Thanks for sharing these adventures with us.

Sincerely,

Gerald Sonnenfeld, Ph.D.  
Vice President for Research  
and Economic Development



# Momentum:

Research & Innovation

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# From Storm to System

by Dan Kopin


**B**efore Hurricane Sandy made landfall on the East Coast, the National Hurricane Center (NHC) had been tracking the storm for thousands of miles. Satellites, research buoys, storm-chasing aircraft and other weather sensors followed Sandy's position, temperature and intensity over the Atlantic.

The storm data, gathered by NHC's weather reconnaissance network, was then processed with a complex computer model, the Hurricane Weather Research and Forecasting (HWRF) system, developed by University of Rhode Island (URI) Professor of Oceanography Isaac Ginis in collaboration with scientists at the National Oceanic and Atmospheric Administration (NOAA) National Centers for Environmental Prediction (NCEP). Government officials used the HWRF forecasts as they prepared the vulnerable coastline for the storm's arrival.

"Hurricane forecasting is just mathematics, physics and computer science," explains Ginis. "First, you develop an understanding of the physical processes involved. You then translate this understanding into mathematical equations. But the mathematical equations are so complex that we cannot solve those equations on a piece of paper; we need powerful computers. Many people do not realize this, but the solution to those equations is the forecast."

The HWRF is an "operational" computer model, meaning that scientists use it as a storm develops in real-time. The model assigns the Atlantic Ocean a mesh of grid points, which Ginis compares to pixels in a TV screen. As with pixels, when the grid points are closer together, there is a higher resolution. But while pixels correspond to colors, grid points correspond to locations where the storm parameters, such as wind and rain, are calculated. The grid point





“Hurricane forecasting is just mathematics,  
physics and computer science...  
the solution to those equations is the forecast.”

- Isaac Ginis

resolution necessary for accurate hurricane predictions is just a few kilometers wide. But when more grid points are added to the system, it becomes much more difficult and expensive to calculate the equations.

Ideally, if Professor Ginis did not have to consider any computing or cost constraints, he would put the grid points as closely together as possible. Indeed, he has a student researching a model with grid points only 30 meters apart. There are, however, strict constraints on how quickly forecasts need to be created for NHC’s operational model.


“A five-day forecast needs to be done within one hour,” Ginis says. For the operational requirements of NHC, he, unfortunately, cannot have the resolution he would like.

NHC’s operational model is not lacking in dynamism, however. The model is supported by

thousands of computer processors and contains hundreds of thousands of lines of code. Its computational design is unique in that it tracks the eye of a storm as it travels across the ocean. Since the winds of a hurricane are strongest in the eye wall, having a higher resolution for the eye region, as HWRF model allows, is crucial.

URI has a proud history of assisting the NHC in improving its forecasts. Through grants from NOAA and the Navy, the University has access to supercomputers for conducting research. Ginis has worked alongside government scientists to make changes to the operational codes of the model. Indeed, after Hurricane Sandy, he met regularly with NCEP scientists for months to address issues in the HWRF that had emerged during the storm.

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A satellite image of a hurricane, likely Hurricane Harvey, over the Gulf of Mexico. The hurricane features a well-defined eye and a dense, swirling cloud structure. The surrounding ocean is dark blue, and the landmasses of North and Central America are visible in green and brown tones.

Ginis's current work focuses on how to improve the accuracy of predicting hurricane intensity.





Isaac Ginis

Professor  
Oceanography

Ginis's current work focuses on how to improve the accuracy of predicting hurricane intensity.

"Existing weather forecast models do a pretty good job of forecasting the track of a storm," he says. "Predicting how strong a hurricane is going to be is what requires the higher resolution. We need to better understand the air-sea interaction phenomena."

A hurricane is driven by evaporation, or heat coming from the ocean. But friction between the hurricane and the ocean water causes the storm to lose its energy. To predict the storm's strength, researchers need to calculate how much energy the hurricane gains from and dissipates to the ocean. The key parameters of this research are the temperatures of the ocean water, on and below the surface, which control the hurricane's intensity.

Ginis has already worked with satellite engineers at NASA's Jet Propulsion Laboratory to improve the detection of ocean surface temperature. Now he is interested in improving the data from instruments that are dropped from storm-chasing aircraft into hurricanes. The instruments send real-time temperature measurements to the operational hurricane model as they sink beneath the waves.

"It's a few thousand dollars for each deployment of the instruments, which are lost after they are used," explains Ginis. He wants to optimize where the instruments are deployed during the hurricane to allow the NHC to make most use of the data.

Ginis says he hopes that his work to make forecasts more accurate will allow homeowners and businesses to take necessary precautions before a storm: "Every time a big storm makes landfall, we are often surprised by the amount of impact. Especially in Rhode Island, I believe that we really need to improve the modeling capabilities here to better understand the risk we face."



# CORE KNOWLEDGE

by Dan Kopin

Rebecca Robinson, associate professor of oceanography at the University of Rhode Island (URI), is an unconventional historian. Robinson studies paleoceanography, the history of ocean systems. Her historical subjects are the grand chemical cycles of carbon and nitrogen — the oceanic-atmospheric pathways on which the chemical substances travel.

But her primary sources, a far cry from the neat documents that most historians cite, are pungent sediment cores extracted from the depths of the ocean floor.

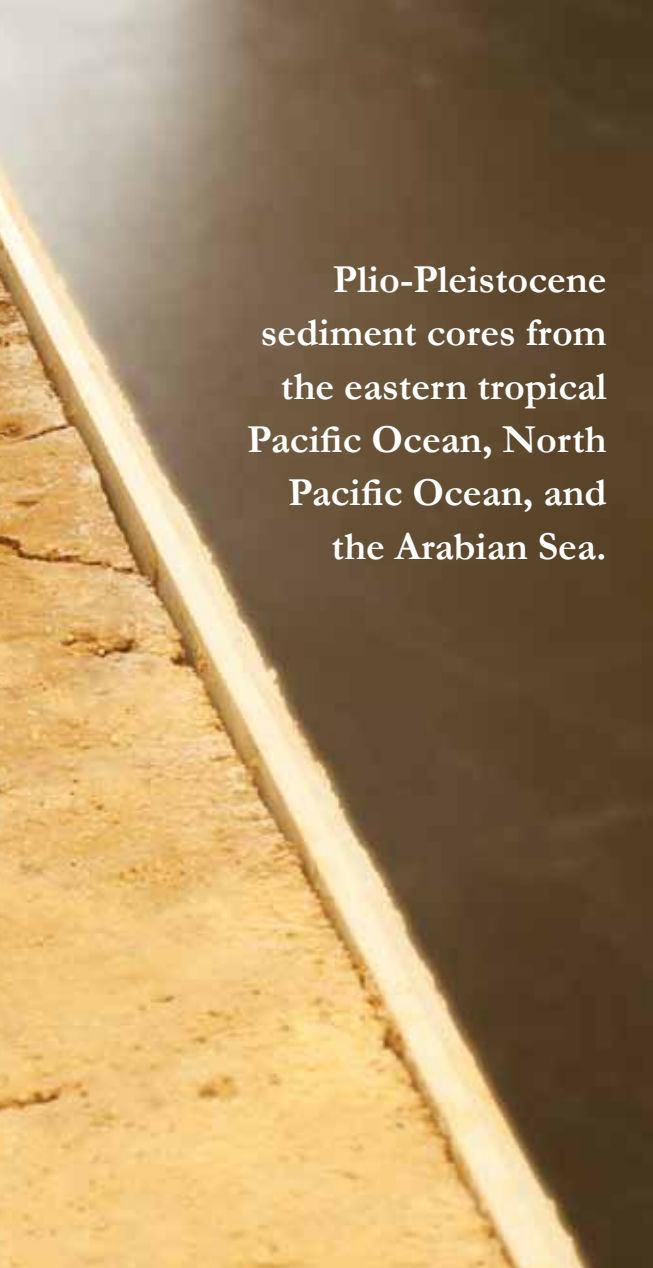
The sediment cores she studies contain records of past climates, such as fossils of tiny plankton known as diatoms, whose shells are created with seawater. If you can examine the fossils, you can understand the chemical makeup of the ocean at the time that the plankton was living.

“What paleoceanography offers you,” Robinson explains, “is a chance to really see how the Earth operates over thousands, or millions, of years.”



Extracting sediment cores





Plio-Pleistocene  
sediment cores from  
the eastern tropical  
Pacific Ocean, North  
Pacific Ocean, and  
the Arabian Sea.



Rebecca Robinson  
Associate Professor  
Oceanography

Robinson mainly studies the Pliocene and Pleistocene (Plio-Pleistocene), two geological eras encompassing a period in the Earth's history about 5 million to 12,000 years ago. During the Pliocene, the Earth was two to three degrees warmer, and the global concentration of carbon dioxide in the atmosphere was 400 parts per million (ppm).

"The Pliocene is considered a good analogue for where the planet is headed today," she says.

In 2012, the Mauna Loa Observatory in Hawaii recorded atmospheric carbon dioxide levels of 400 ppm. The Pleistocene was, alternatively, a period of cooling and ice ages.

"My motivation for working on this

timescale is that the Pliocene was a relatively warm climate," Robinson says. "The continents were all in the same place and the ocean circulation was, to some degree, similar to today. It's an interesting place to ask, what was the chemistry of the ocean like in a warm climate?"

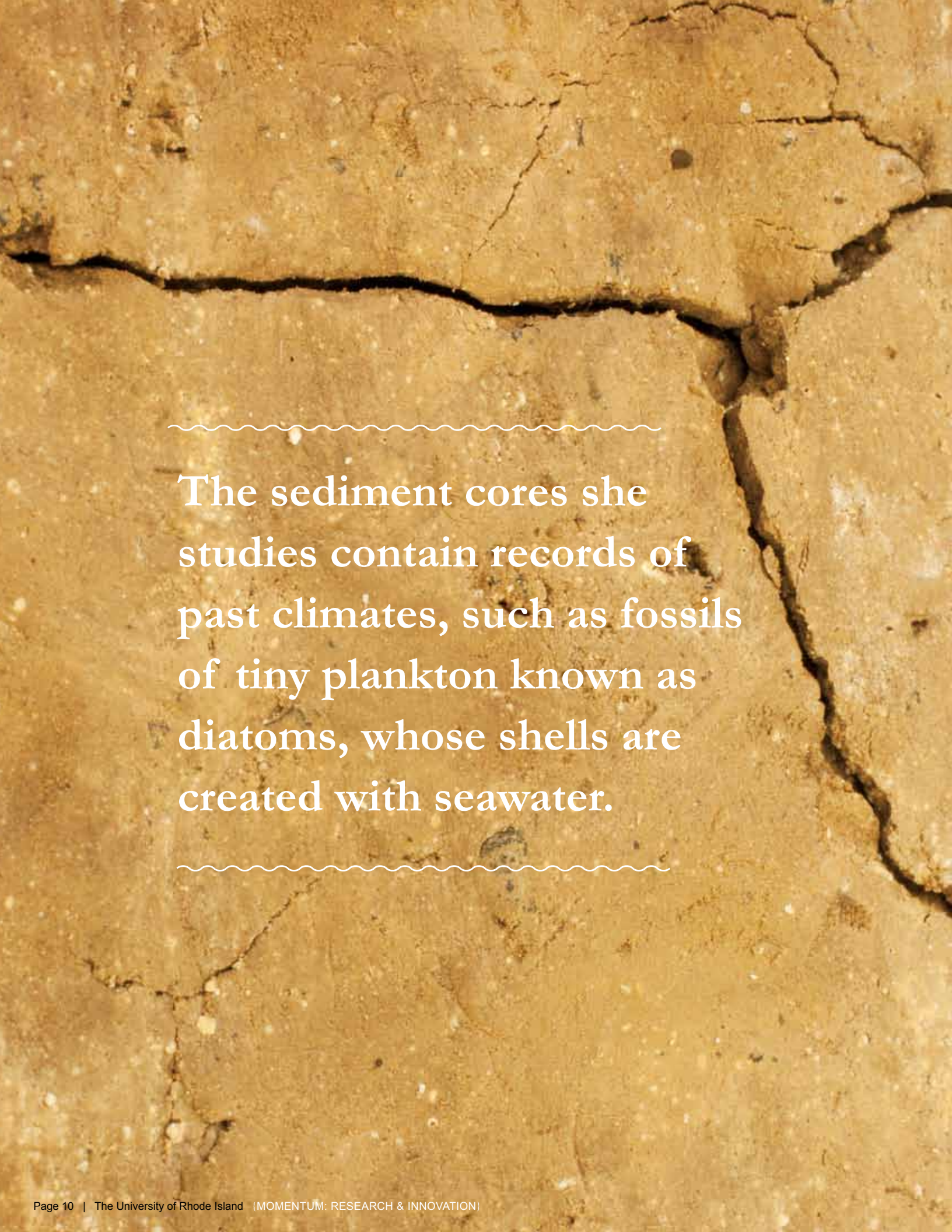
Some scientific literature has voiced concerns that the ocean will lose oxygen as the Earth warms. Just like a bottle of soda staying carbonated for longer in a fridge than at room temperature, the ocean holds more gas when it is colder. If global temperatures increase, some scientists worry, than the ocean will hold less oxygen.

But in her examination of Plio-Pleistocene sediment cores from the

During the last 50 years, there have been significant changes to diatom communities in Narragansett Bay.

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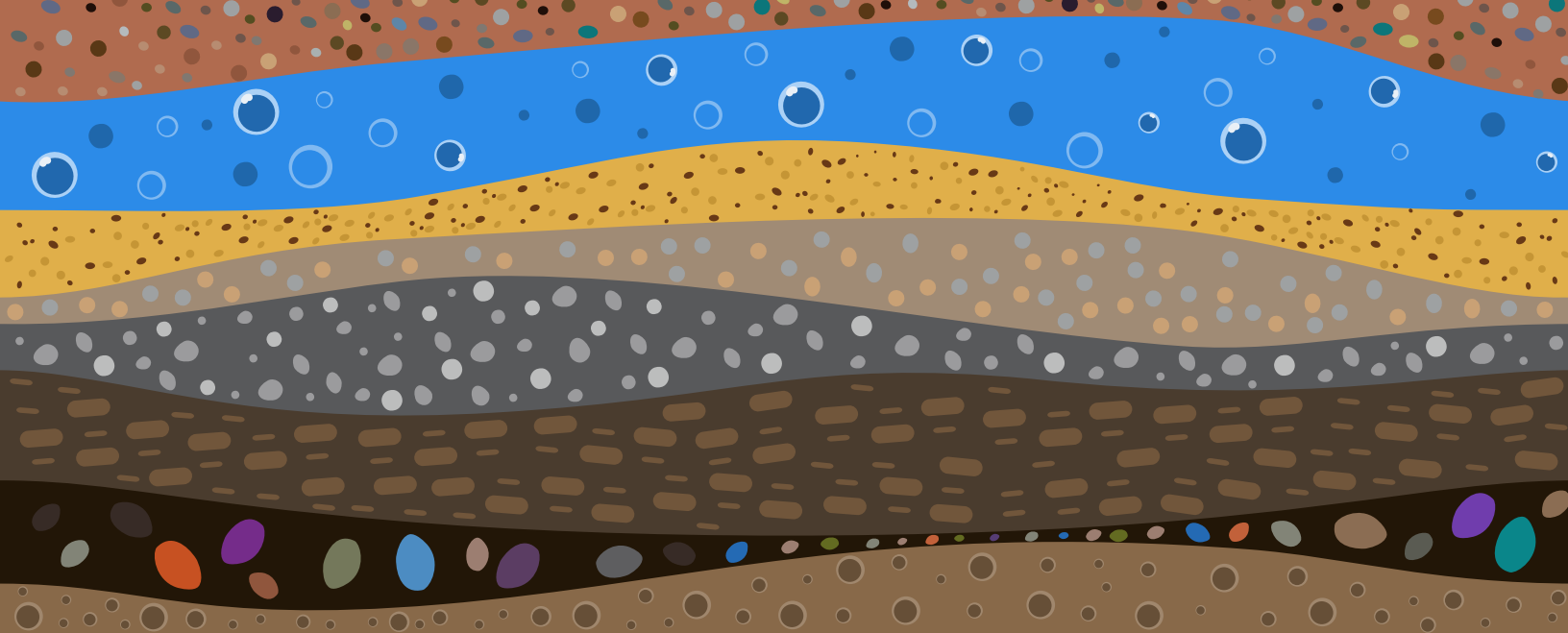


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The sediment cores she studies contain records of past climates, such as fossils of tiny plankton known as diatoms, whose shells are created with seawater.

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eastern tropical Pacific Ocean, North Pacific Ocean, and the Arabian Sea, Robinson found that when temperatures cooled there was evidence for lower oxygen concentrations in these regions.

The areas where Robinson sampled are “oxygen minimum zones,” regions characterized by low oxygen saturation and high levels of respiration from organisms. Intuitively, one would expect an oxygen minimum zone to grow with a warmer climate and shrink with a cooler climate. Examining the chemical makeup of organic matter found in the sediment cores, however, Robinson found the opposite.

Her results suggest that the interactions between ocean biology and climate driven physical changes are more complicated than the first-order notion that warmer waters hold less oxygen.

“The question remains of how much biology was controlling the size of the zone versus how much climate influenced its size,” Robinson says.

Robinson’s research into oxygen minimum zones is part of a larger endeavor entitled, “High latitude controls on low latitude biogeochemistry.” By looking at core records, mostly from the tropical Pacific but also from the Southern Ocean, she is examining the link between high and low latitude climate and biogeochemistry over the last 3 million years.

In June, Robinson will begin a project evaluating how the tools we use to study biogeochemistry in the past – chemical signatures in diatom fossils – are really related to the water chemistry when they are formed. This is a modern study of how chemical signatures get created. This project will evaluate how well Robinson and her team can reconstruct seawater chemistry from the past.

This lab-based and field-based project will take her and students from URI and the University of California, Santa Barbara to the Southern Ocean off the coast of Antarctica in 2017. Robinson and her colleagues hope to collect water samples, to determine how diatoms record chemistry of today’s ocean, as well as sediment cores with diatom fossils, to determine the accuracy of her chemical reconstruction of the past.

Robinson has another upcoming project, much closer to home.

During the last 50 years, there have been significant changes to diatom communities in Narragansett Bay. Scientists are uncertain if the changes are related to climatic changes or to an over-enrichment of nutrients like nitrogen in the Bay. The changes are documented in the URI Graduate School of Oceanography plankton time series dataset, from samples collected from the Bay and analyzed by hand. Robinson and colleagues seek to extend the analysis back in time by looking at diatom fossils in sediment cores.

Working with local researchers from URI and Brown University, Robinson hopes to extract sediment cores from the Bay, which contain diatom microfossils aged 300 to 1,000 years. In addition to examining the diatom fossils by hand, Robinson will apply a novel method for studying the fossils using a FlowCAM, an imaging-based particle analysis system. The FlowCAM feeds information about the diatom fossils’ shape and volume to a searchable, digital library of diatoms.

“Normally, we have to count and identify 500 individual particles by hand,” Robinson says. “What we can do with the FlowCAM is put the sediment in and ask it to count and analyze 10,000 particles.”

Robinson had a URI undergraduate student teach the computer how to distinguish among the different types of diatom microfossils from the Southern Ocean. Now she hopes to bring her techniques to more recent history in Narragansett Bay.

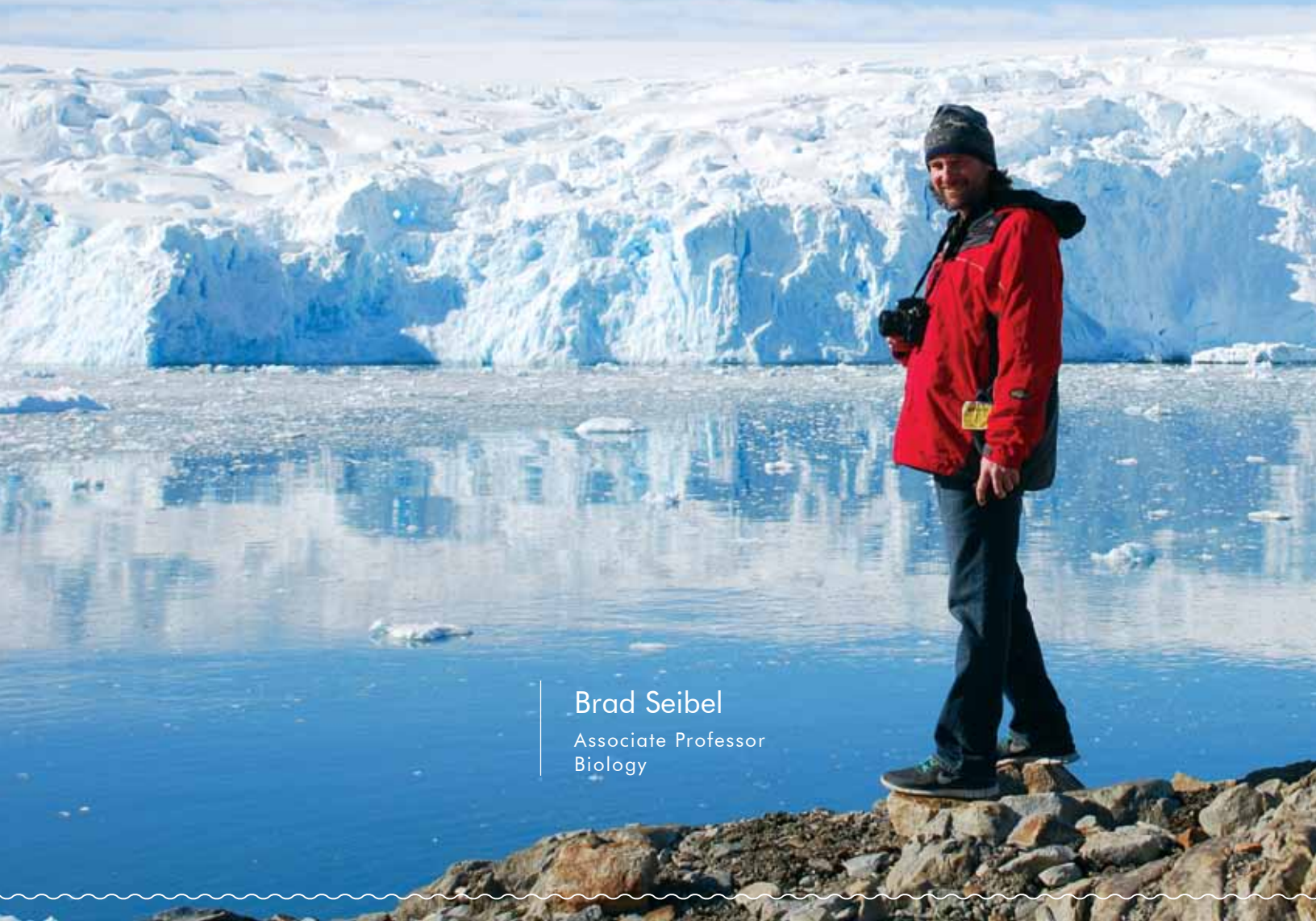
“It’s helpful to think of the past as a natural experiment,” Robinson says. “While the future won’t look exactly like the past, understanding the past may help us understand the future.”



# THE IMPORTANCE OF KRILL:

## Impacts of Climate Change Trends on the Food Chain

by Mary Grady



Brad Seibel

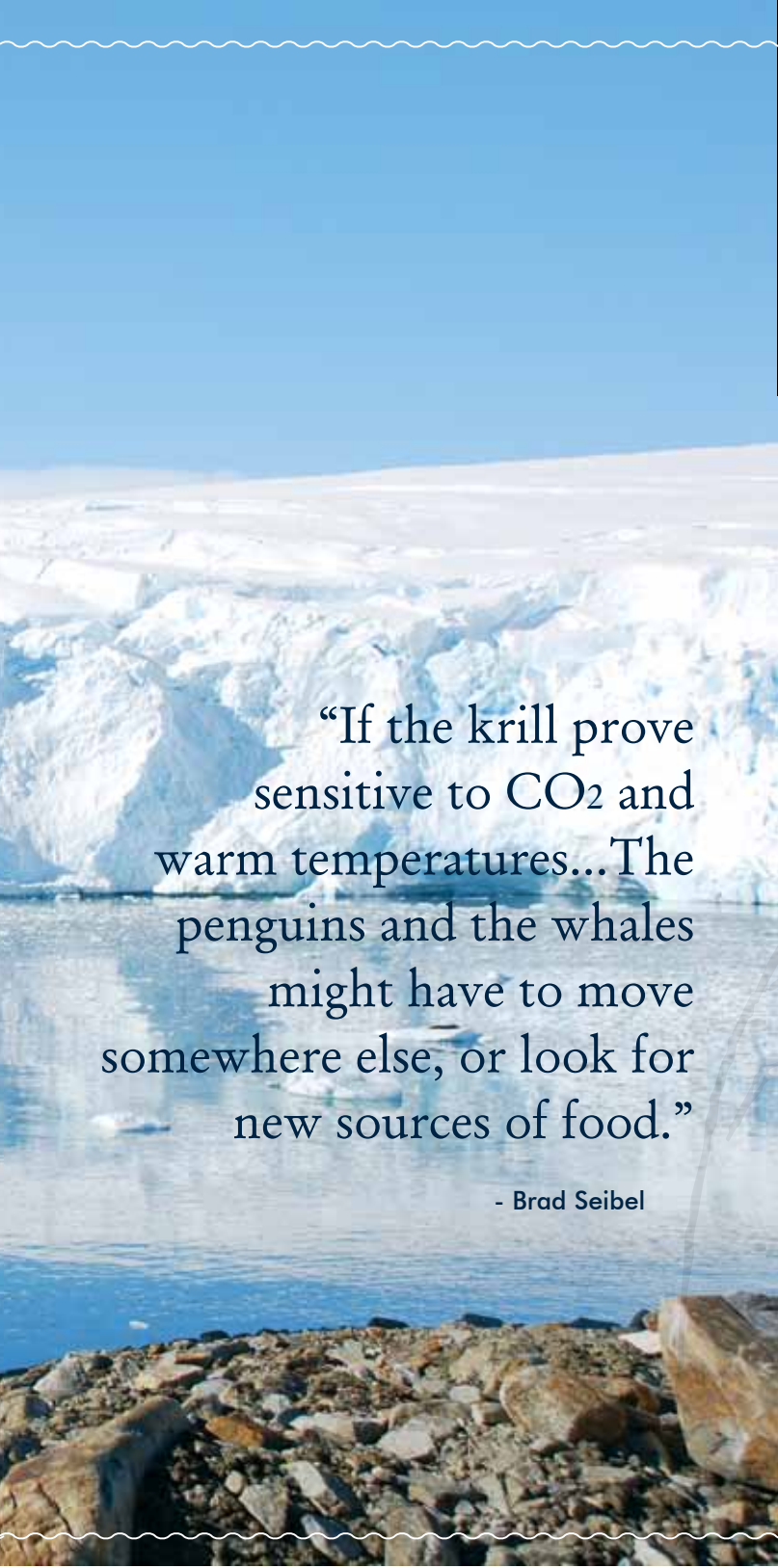
Associate Professor  
Biology

At the Palmer research station, perched on the rocky shore of tiny Anvers Island just outside the Antarctic Circle, the summer temperatures in February hover at about 36 degrees Fahrenheit. This chilly spot, surrounded by glaciers and icebergs, may seem an odd choice for a site to study the effects of global warming, but Brad Seibel, University of Rhode Island (URI) associate professor of biology, is now in the second year of doing just that, investigating the effect of warming ocean waters on krill. These small shrimp-like crustaceans, only about two inches long, form a crucial link in the oceanic food chain.

"Phytoplankton are the very base of the food chain," Seibel says. "Krill eat the phytoplankton, then penguins and whales and many other animals eat the krill."

In conjunction with long-term studies along the Palmer peninsula, Seibel's study aims to determine the response of krill populations to climate change.





“If the krill prove sensitive to CO<sub>2</sub> and warm temperatures...The penguins and the whales might have to move somewhere else, or look for new sources of food.”

- Brad Seibel

Before the work could start, Seibel and his research team faced an odyssey simply to reach the station. First, there is a 20-hour flight from Rhode Island to Punta Arenas, near the southern tip of Chile, then five days to cross the rough waters of the Drake Passage aboard the NOAA research vessel *Laurence M. Gould*.

After dropping off the scientists, the ship turned back out to sea to fill its nets with krill for the next batch of experiments. Once collected, the krill are kept in tanks at the station.



“We’re testing the krill’s sensitivity to changes in carbon dioxide and temperature,” says Seibel. “Our first year here was mostly spent figuring out how to do the experiments. It’s a very small temperature range we’re trying to control, and it’s very difficult to do.”

This year, Seibel and his team, which includes URI graduate student Abigail Bockus and URI lab technician Tracy Shaw, have the system up and running. Some of the tanks are kept at a temperature and CO<sub>2</sub> level similar to the current Antarctic Ocean; a second set of tanks contain warmer water and current CO<sub>2</sub> levels; and a third set contain water that is both warmer and higher in CO<sub>2</sub> concentrations.

“We’re exposing the krill to a level of CO<sub>2</sub> consistent with what climate models show will be found 85 years from now, in 2100,” says Seibel.

Most animals in the Antarctic are very sensitive to temperatures, and if the krill also are, they will probably die if the water gets too warm. While a lot of animals are sensitive to changes in CO<sub>2</sub>, Seibel is not so sure krill react in the same manner.

“If the krill prove sensitive to CO<sub>2</sub> and warm temperatures, then that doesn’t bode well for the health of these populations over the next hundred years or so,” he says. “The penguins and the whales might have to move somewhere else, or look for new sources of food.”

A veteran of eight trips to Antarctica, Seibel spent about a month at Palmer Station for this project. For his next research trip, in May 2015, he plans to visit a much balmer part of the world: searching for Humboldt squid off Baja, Mexico, to document how changes in CO<sub>2</sub>, temperature and oxygen in those warm waters are affecting life in the sea.





Ghana fishing community, nets and boats

# Lives in the Balance:

## Protecting Our Planet's Coastal Communities

by Bruce Mason

Half of the world's population lives within 50 miles of the sea and more than three-quarters of the world's major cities sit along the coasts. This translates to more than one billion people who depend on the oceans' fish as their major food source. However, due to overfishing, pollution and other unsustainable practices, this source of food security lies on the verge of collapse. With the global economic value of our oceans estimated at more than \$20 billion per year, the damage to the world's oceans not only affects ecosystems, but also the social and economic well-being of the coastal communities that depend on fish as a way of life.

For 40 years, the Coastal Resources Center (CRC) at the University of Rhode Island's (URI) Graduate School of Oceanography has worked to protect the livelihoods our oceans

provide. Coastal communities, economies and ecosystems are critically important to the welfare of our nation and planet, and the CRC — which overlooks Rhode Island's Narragansett Bay — is committed to advancing coastal management and protection worldwide.

Last October, the United States Agency for International Development (USAID) awarded a \$24 million grant — the largest in URI's history — to the CRC to lead a five-year sustainable fisheries project in Ghana, West Africa. The objective of the USAID/Ghana Sustainable Fisheries Management Project is to rebuild key marine fisheries stocks through responsible fishing practices. The project aims to set up a legal framework to protect the fisheries, develop more effective management plans and educate policymakers and the public.



Coastal communities, economies and ecosystems are critically important to the welfare of our nation and planet, and CRC — which overlooks Rhode Island's Narragansett Bay.



Ghana Shoreline

"This will be a very challenging and ambitious project," says Brian Crawford, URI Senior Coastal Resources Manager who joined the CRC in 1988 and is the project director for the USAID/Ghana Sustainable Fisheries Management Project. "If successful, our work with the Ghana Ministry of Fisheries and Aquaculture Development will reverse the trend in declining fish catches."

Crawford, who moved to Accra, Ghana, this past January, has more than three decades of experience working in international development in Africa, Asia and Latin America in the fields of marine conservation, sustainable fisheries and integrated coastal management.

Explaining why Ghana was chosen for this initiative, Crawford says a good opportunity existed to make progress quickly — there are many talented individuals who understand the issues at stake and officials in senior levels of government and stakeholders are ready to turn the fishery around.

"The marine fisheries here are on the verge of collapse, where 10 years ago they were harvesting 130,000 metric tons of fish per year and now they are catching only about 30,000 metric tons per year," says Crawford. "In Ghana, fish play an important role in food security. More than 60 percent of the animal protein in the diet comes from fish."

"A substantial portion of this fish food supply comes from

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Brian Crawford

Senior Coastal Resources Manager  
Graduate School of Oceanography





Ghana fishing community

the small pelagic fisheries—herring, sardines, anchovy. These fish have excellent nutritional qualities in terms of protein, micronutrients and omega3 fatty acids. It is also a relatively cheap food source. These fish are caught, smoked and dried and travel long distances in the food supply chain, including into the northern part of Ghana and other Sahel countries where poverty and low nutrition rates among the population are high.”

A former Peace Corps volunteer who served in Malaysia and the Philippines, Crawford has focused on small-scale fisheries in West Africa, where he oversaw the implementation of several USAID initiatives such as empowering women

through improvements in the fisheries value chain and establishing collective use rights for women oyster harvesters in Gambia.

“Many of these women are angry that poor management of the fishery is now impacting their businesses due to reduced fish supply,” he explains. “Many believe that some of the illegal practices employed in harvesting also lands poorer quality fish, further impacting their business. In other parts of Africa, such as in Senegal, we have seen women refuse to buy illegally caught fish or juvenile fish, forcing fishers to adopt better practices that will help return the fishery to a healthier state. We hope that by

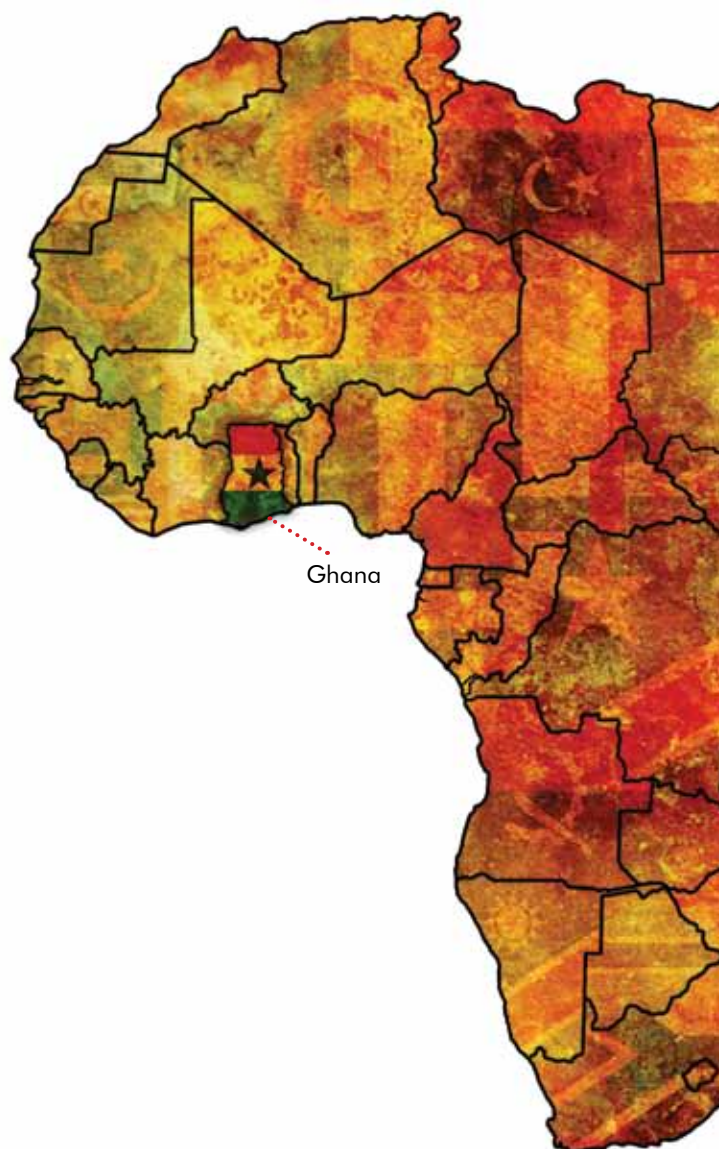




sector in the Central Region of Ghana. The grant also provides a university strengthening component with the University of Cape Coast (UCC) to improve its applied research and extension services in coastal and fisheries management.

Crawford is enthusiastic about the partnership between URI and UCC. He notes that both universities are working together to help build capacity to benefit coastal communities and assist government in making more informed policy choices regarding the fishery and coastal development.

"We have already had several faculty visit URI to learn about our Land and Sea Grant models of applied research and extension and how they might be adapted in a Ghana context," Crawford says. "Over the life of the project we expect that there will be faculty and student exchanges, both UCC faculty and students visiting Rhode Island to learn from our experiences locally, and URI faculty and students visiting Ghana as well."



working with the women to improve their businesses, we will also empower them as advocates of sustainable fishing practices as well."

Part of President Barack Obama's Feed the Future initiative, a federal government effort to boost food resources in developing countries, the USAID/Ghana Sustainable Fisheries Management Project aims to benefit more than 100,000 people involved in the local Ghanaian fishing industry. The project's goals include helping to secure the jobs of tens of thousands of women involved in the processing and marketing of smoked fish and, efforts to reduce child labor and trafficking in the fisheries



# Natural Rhythms NATURAL SYSTEMS

by Mary Grady

Scott McWilliams

Professor, Natural  
Resources Science

## It's easy to take birds for granted.

Birds are everywhere, but we don't always notice them; they fly by on the edge of our awareness. But for Scott McWilliams, professor of Natural Resources Science at the University of Rhode Island (URI), the study of birds provides a pathway into discovering how ecosystems work, how human activities affect natural resources, and ultimately, how our choices shape the future of our planet.

The American woodcock, a small, round bird with brownish plumage that inhabits scrubby forests, is best known for its odd countenance — a long thin beak and big round eyes are an unusual mix — and its eccentric mating behavior. In the springtime, the males seek out a clearing in the woods and dazzle prospective mates with a spiraling flight, climbing up to 300 feet in tight circles, buzzing and chirping all the way.

"Woodcock populations in Rhode Island have declined precipitously over the last 100 years," says McWilliams, citing human transformation of the landscape as the primary cause. "If you think of what our state looked like 100 years ago, there were lots of farms and fields here, and the woodcocks love that. The population did really well with early settlement."

But fast-forward through the last century, and those farms and fields have vanished, replaced by a thick uniform forest, a habitat less appealing to the woodcocks.

"We put tracking transmitters on woodcocks to learn how management of the forest affects them," says McWilliams. "Woodcocks clearly prefer to inhabit forests that are early in their growth, five to 20 years old, and this type of young forest habitat is now relatively rare. We also found that the woodcock can be considered an 'umbrella species' in the sense that when you manage for woodcocks, other birds also will thrive."

The woodcock studies are conducted in collaboration with the Rhode Island Division of Fish and Wildlife, and have led to statewide initiatives to better manage woodlands for wildlife. McWilliams and his team mapped the young forests for the whole state and are now working with all the parties involved in land conservation, including local land trusts, to produce a statewide plan. This work will be continuing over the next five years.



Nanotag tracking device



McWilliams and his team mapped the young forests for the whole state and are now working with all the parties involved in land conservation.



Along with these new strategies for managing the state's woodland resources, McWilliams and his collaborators have been studying the ways migratory birds use our coastlines, a region that has long been important for fishing and tourism, but now promises to be the site of offshore wind farms as well. Given that millions of birds migrate through southern New England each fall, how might they be affected by future offshore wind power?

"In collaboration with my ornithological colleague at URI, Professor Peter Paton, and the R.I. Division of Fish and Wildlife, and as part of the Rhode Island Ocean Special Area Management Plan (RI OSAMP), we have documented the distribution and abundance of all types of birds in our region during all seasons," says McWilliams. This has involved counting birds from airplanes and boats, monitoring them with radar during the day and night, and placing electronic devices on birds to track their movements.

The research team also recorded the vocalizations of songbirds and bats as they flew above the southern Rhode Island coast and Block Island, and described the weather patterns associated with peaks in passage. These studies informed the development of statistical models that can predict times of high and low migratory activity, based on wind speed and direction, temperature and precipitation, to effectively identify periods of high risk during migration.

By mapping the birds' locations and movements, the researchers hope to ensure that as wind farms are built, they can share the habitat with the least possible impact on wild populations. For example, in Europe, ahead of the U.S. in offshore windfarm development, turbines are shut down during busy migration periods.

The RI OSAMP recommended that wind farms should not be placed in waters shallower than 20 meters because these areas include habitats very important for a variety of sea ducks and other marine birds.

Another ongoing project in the McWilliams lab reveals how songbirds on Block Island choose the nutrient-dense foods so critical to sustain their migration. This work is conducted in collaboration with Navindra Seeram, associate professor of biomedical and pharmaceutical sciences in URI's College of Pharmacy, and has shown, for example, that Arrowwood fruits are highly prized by the migrants, and these fruits offer a unique combination of high-quality fats and antioxidants that protect the birds' cells from damage during their long, exhausting migratory flights.

These studies of wild bird populations, mixing the latest in research technology with classic in-the-field observations and experiments, expand our understanding of the natural systems we depend on, and provide a scientific foundation for management policies. The National Science Foundation has supported McWilliams' songbird research with funding since 2000, and awarded the lab another three-year grant in September 2014. This work, in combination with studies of the basic physiology and ecology of migratory birds, allows McWilliams to generate new knowledge about the world of migratory birds and to be involved in its broadest of impacts.

But beyond that, says McWilliams, our curiosity about birds can help people with busy, urban lives remember that we are part of nature. "I grew up in Ohio where birds were my harbingers of seasonal change. They have always provided me a fine excuse to get outside and tromp around," he says.

"Everyone has some personal connection to birds," McWilliams says. "Whether it's feeding birds in winter, or looking for them at a park or reserve, or just watching the wild geese migrate. It's a way to stay connected to natural rhythms and natural systems."



# New Frontiers in Archaeology

by Hugh Markey

Archaeology is sometimes described as the stepchild of History and Anthropology, the two departments where archaeologists are most often found in North American universities. At the University of Rhode Island (URI), three archaeologists raised in very different disciplines have joined forces to form their own unique family.

## ROD MATHER: Archaeology, a Tool in Multiple Disciplines

History Professors Rod Mather and Bridget Buxton and Anthropology Professor Kris Bovy all pursue archaeological questions connected with the coasts and sea, but their fieldwork, research interests and especially their methods could not be more diverse. Where they share similarities are their broad goals of understanding human and environmental interactions.

"Archaeology is practiced by several different disciplines at URI," says Mather, director of the Archaeology and Anthropology option in History's masters program. "When Kris is out digging with trowels and brushing off materials with paintbrushes, she's doing archaeology, but the central questions she's pursuing are anthropological in nature. When Bridget and I do archaeology, it might look exactly the same, but our questions are historical or art historical. Archaeology is a tool to answer questions in multiple disciplines."

Mather runs an underwater archaeology field

school in Bermuda, where students from URI and around the United States learn practical skills and conduct real research on the island's many historic shipwrecks.

"We teach students how to identify shipwrecks," he says. "We teach them about changes in the maritime technology and the way those changes are reflected in the archaeological record; how to distinguish when and where a ship was made."

Last year, several of Mather's URI students published an original article about one of Bermuda's mystery shipwrecks. A combination of careful archival research and fieldwork enabled the students to identify the wreck as the *Enchantress*, which was lost in 1837 while bringing Irish immigrants to the New World. Thanks to their efforts, the story of the *Enchantress* has been brought back to life, revealing a colorful history that included ferrying convicts to Australia and venturing as far east as Calcutta.

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FOR MATHER,  
HIS QUEST TO  
UNDERSTAND THE  
MYSTERIES OF THE  
PAST BRING HIM  
FAR BEYOND CAMPUS.  
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Mather is no stranger to the thrill of discovery himself, having recently directed an expedition off the continental shelf of Virginia which led to the discovery of an entire missing fleet of WWI-era German ships and submarines. The vessels were war prizes allocated to the United States at the end of the war, and included a battleship, a cruiser, three destroyers, and three submarines. The entire fleet was sunk deliberately as part of "Project B," at the time the largest naval arms test in U.S. History. The event became famous in the history of American air power because of the sinking of the battleship by Army planes under the command of maverick general "Billy" Mitchell, the father of the U.S. Air Force. The location and historical significance of the wrecks had been largely forgotten.

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Today the fleet of former German warships lay spread across the sea floor at depths of many hundred feet, representing real historic treasures. Mather and his colleague John Jensen, research associate professor of History and Maritime/Cultural Heritage at URI, are currently in the final year of a four-year study to record and assess the condition of each vessel, a task that involves coordinating with researchers from 17 other institutions. Mather's research will assist the federal

government in determining whether and how to develop the economic potential of the continental shelf while protecting the environment and the sunken cultural heritage that now belongs to all Americans.

In another ambitious project Mather and Jensen are assisting the U.S. National Park Service to study George Washington's birthplace in Virginia. Mather and Jensen have been developing a paradigm for exploring and interpreting historic human interactions with what was, at the time, the

lifeblood of the area: the Potomac River.

"We want to know the specific ways people used the river to obtain food and travel and how these things changed over time?" Mather asks. In the late 17th century, the area of the Potomac settled by Washington's great-grandfather had a direct connection with the Atlantic World, but during the 18th and 19th centuries gradually became a backwater.



Rod Mather diving expeditions



"If you were traveling the region in 1750, the interstate for you, essentially, would have been the river," Mather says. "That's how you would have approached the plantation; that's how you would have seen it. In modern times, we look to the land and the highway system, but the original focus for both the Native Americans, as well as the colonists, was the river."

The first plan to memorialize Washington's birthplace implemented in 1890s preserved the water orientation, but failed to take into account the natural characteristics of ice and high rates of erosion that made it impossible to maintain a pier adjacent to the Washington plantations. When the Memorial was redeveloped under the guidance of the National Park Service in the early 1930s, the park designers re-oriented the memorial and the property towards the new state highway. By effectively turning the orientation of the site 180 degrees and moving from river to road, a vital sense of how the Washington family and their contemporaries understood and organized their world was lost.

Through their projects, Mather and Jensen have been working to create a new philosophical and intellectual approach to understanding archaeological sites and human history at the confluence of water and land.

"In each place, we try to examine that same question: what was the relationship of human beings to the natural world?" Mather says. "Over the past 20 years, John and I have developed a paradigm for this kind of work based on the idea of cultural landscapes. It's an approach to cultural heritage that has attracted the interest of a number of federal agencies. Essentially, we are working to reconfigure the way historical preservation should take place in a coastal zone."



Rod Mather  
Professor, History

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## BRIDGET BUXTON: Classical Underwater Archaeologist

On the other side of the world, in the warm waters of the Mediterranean, Buxton has made ancient shipwrecks and harbors her focus. Unlike historical archaeologists Mather and Jensen, Buxton was trained as a Classical archaeologist in departments where ancient Greek and Latin were as commonplace as English. At Buxton's underwater archaeology field school in the 2300-year-old Hellenistic port of Akko, Israel, shipwrecks from the era of Bermuda's *Enchantress* are simply the top layer in a history that goes all the way back to the Bronze Age. Working with the Israel Antiquities Authority (IAA), Buxton's team has been involved in the discovery and identification of multiple shipwrecks, including warships from the 1830s Ottoman-Egyptian War and the Napoleonic Siege of Akko. The biggest question they are exploring at Akko is how the ancient quays and slipways ended up buried in sand almost two meters below the modern sea level. Last year Buxton also led an expedition to King Herod's ancient harbor at Caesarea, where she is working with a team of marine robotics engineers from Croatia to map the underwater ruins.


"One of the interesting things about these ancient harbors is that they're very good indicators of environmental change over long periods of time. How the rivers have changed, how sea levels have changed," Buxton says.

The discoveries at Akko and Caesarea seem to confirm a new theory that most of Israel's coastal infrastructure was wiped out several times over the last few millennia due to massive earthquakes and tsunamis. In the middle of the harbor at Akko, for example, an ancient layer of destruction includes complete but shattered bowls and glass goblets — telltale signs of an earthquake. It is evidence that could change the way we interpret many key developments in the ancient Near East, including the decline of the Byzantine Empire and the military success of Islam.

For the past three years, Buxton has taken URI students to Akko to conduct research and excavation. The special relationship she has built with the IAA means that her students are often the first in the world to see new discoveries come out of the water, for example a priceless 16th century bronze Venetian cannon that the URI team raised in 2013. Buxton has also been successful in finding shipwrecks buried under Israel's deep coastal sands. For her, the Carmel coast of Israel is the best place in the world to be looking for well-preserved ancient ships.

"One of the myths propagated on TV is that the best preserved and most interesting wrecks are to be found in deep water," she says. "But actually, it's more important that the wrecks should





"One of the interesting things about these ancient harbors is that they're very good indicators of environmental change over long periods of time. How the rivers have changed, how sea levels have changed."

- Bridget Buxton

be buried. In the case of this Ottoman warship, when the IAA Maritime Unit director went to investigate the wreck after a storm exposed it, he found the cooking pot still filled with bones from the crew's last meal."

Buxton's interest is primarily in these buried shallow water sites, not just because they are the best preserved, but because they are also the most threatened by coastal erosion. If the sea gets to these sites before researchers do, there will be nothing left.

Buxton's other research brings her to waters off Croatia, to an island called Vis, home to an important airfield in World War II. In 2013, she began collaborating with an aviation archaeologist to investigate a famous B24 bomber known as the TulsaAmerican, now at the bottom of the Adriatic Sea.

"We visited the area first as tourists in order to explore and plan logistics for a full-scale project, and had some very exciting dives on the B24 last year," she says. "This plane was the last one made at the factory in Oklahoma. Everyone in

the factory signed the fuselage, and the public followed the reports of the plane's missions right up until the end. It's still in excellent condition. But in the sea its days are numbered. Ultimately, I know my colleague would like to negotiate with the Croatians to bring some small part of it back home to the USA, to Tulsa. But the first step is a full conservation assessment."

While they were visiting the island, the archaeologists heard many stories from local divers and fisherman and were shown additional parts of American bombers and target maps of potential shipwrecks.

"There are parts of planes that have been brought in by fishing boats, and we have some good information about where the parts came from," she says. "One day I hope we'll be able to do a lot more around this area. There are definitely ancient ships around Vis, too, but the most important thing at this stage is to set small goals and develop the relationships with the local authorities that will enable us to plan for bigger things in the future."

Buxton emphasizes that there remains much for future archaeologists to discover. If you read a bit about the history of archaeology, it's easy to assume that the golden age of archaeology is over, that everything really big and amazing was found by the 1930s, the age of Indiana Jones. In fact the opposite is true.

"People are still finding lost cities and civilizations and treasure-filled tombs on a regular basis," Buxton says. "As for the golden age of discovery in underwater archaeology – well, we're just getting started."

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**Bridget Buxton**

Associate Professor, History

“This data will have use beyond the field of archaeology, informing current discussions of climate change, as well as wildlife and natural hazard management in the region.”

- Kris Bovy



## KRIS BOVY: Building Knowledge from Bones

Bovy works at a table covered with bird bones — some stained with age, some bleached white, some broken, some whole. The parts that lie in front of her are like a 15,000-piece jigsaw puzzle with no box top to show what the completed project should look like.

The rate at which Bovy is able to identify the type of bone she is looking at, among the thousands arranged on that work table, varies widely. Sometimes she can get through a hundred in an hour. In other cases, she may

spend over an hour trying to match one bone to the comparative specimens she’s borrowed from museums. The intimidating effort, along with the esoteric nature of her work, seem to make her more inspired.

“When most people think of archaeology, they think of digging, which is an important and fun part of the process,” she says. “But, it is through detailed lab work that we really begin to understand and make sense of the past.”

Bovy is examining a large collection dug from a 2,000-year-old coastal archaeological site, Tse-whit-zen Village, in Washington State. The Lower Elwha K’lallam Tribe made its home in this area, and the tribe’s descendants still populate Washington. From roughly AD 200 to 1900, the tribe survived large earthquakes, the Little Ice Age, the Medieval Climatic Anomaly and a gradual increase in sheltered intertidal habitat near the site.

Bovy, along with a team of experts skilled in fish, shellfish, mammals, and geologic archaeology, is working on a collaborative three-year National Science Foundation grant. She and her colleagues are seeking to identify how these major environmental events affected the food resources on which the native peoples depended, and how people adapted in response.

“The site offers a high-resolution record of past human use of animal resources that is unparalleled in the Northwest coast,” she says.

Bird remains collected from coastal shell middens, individual dumps where native peoples cast off bones and other waste materials, offer insights to past diets and processing techniques. Shell middens are known for having excellent preservation of even small and fragile bones. Common Murres and diving ducks make up most of what has been identified from the Tse-whit-zen site so far. She has also





Great Blue Heron skull

identified a wide variety of seabirds, including gulls, loons, shearwaters and grebes. Even the blackening of some of the bones she is examining offers an important clue, reflecting the likelihood that the birds were roasted over open flames.

Bovy and her colleagues also plan to compare how different households responded to environmental changes over the long occupation of the site. How did factors such as social status, access to resources, household organization and economic specialization influence the response of individual households? Understanding these highly individualized coping skills requires a series of documented environmental changes, households of differing ages, and enough midden evidence to examine. The Tse-whit-zen site is unique in the region in meeting all these data requirements.

Bovy says the information gathered will be shared with the Lower Elwha K'lallam tribal members and educators who are planning a museum devoted to their cultural heritage. Her team also hopes to work with wildlife managers to assess the biological relevance of their research. While biologists are able to make very detailed observations of animals, they lack the critical time depth provided by archaeology.

"Our study will provide specific information on how people and animals responded to past environmental events over a very long period of time. This data will have use beyond the field of archaeology, informing current discussions of climate change, as well as wildlife and natural hazard management in the region," Bovy says.

A project of this magnitude has also allowed her to bring students into the process. Since Bovy began working on the project in 2011 through a URI Council for Research grant, she has had more than a dozen students



**Kris Bovy**, Assistant Professor  
Sociology and Anthropology

participate in her zooarchaeology lab, in some cases using their work to create honors theses or scholarly papers.

"It's rewarding to be able to give students some direct experience in archaeology," Bovy says.



# BORN TO CARE

## Studying the Link Between Genes and Empathy

by Dara Chadwick

Katheleen Hawes' research started with two simple questions: Can the ability to recognize how someone else is feeling help *you* manage stress? And is the ability to put yourself in someone else's shoes, so to speak, a learned behavior or is it rooted in physiology?

The answers to those questions are exactly what Hawes hopes to garner from her study Neuroendocrine Correlates of Empathy and Stress Reactivity in Registered Nurses. She's looking at how the presence—or lack—of a particular oxytocin receptor gene in nurses relates to their individual empathy levels and how they react to stress. Hawes, an assistant professor in the University of Rhode Island's (URI) College of Nursing, says nursing provides an ideal environment to ask these questions.

"There's a lot of workplace bullying," she says, noting that this behavior also is known as lateral violence. "I experienced this as a new nurse and I also teach registered nurses coming back to get their bachelor's degree. Nine out of 10 say they've been bullied, and much of that has to do with how people react to stress."

For the exploratory one-year pilot study funded by the URI Council for Research, Hawes and a graduate assistant went to Women & Infants Hospital and told nurses they were looking at the relationship between oxytocin receptors and reactions to stress.

"Anytime you start talking to nurses in a unit about stress, there's a line out the door," she says.

A cheek swab was taken from 20 nurses during the summer of 2014 and those same nurses answered a series of standardized questions about their stress levels and how they react to stress. Participating nurses were asked about stress, burnout and bullying, and administered a test similar to the "Eyes of the Mind" test, which measures the ability to recognize emotion by looking at faces.


The swab samples will tell Hawes and her team which of the nurses have the oxytocin receptor gene polymorphism, which is associated with higher levels of self-reported empathy and lower levels of stress reactivity.

The next step, Hawes says, is a correlational analysis of which nurses were positive for the oxytocin receptor genotype, how they answered the questions, and how they performed on the test.

Hawes, a psychiatric clinical nurse specialist who also







## Katheleen Hawes

Assistant Professor, Nursing

works as a research scientist at the Brown Center for Children and Families, in Providence, R.I. says she hopes the preliminary data gleaned from this study will lead to a larger study that could ultimately result in the development of workplace interventions and improved patient safety.



Oxytocin receptor genotype

"We know that stress and burnout are highly correlated," she says, adding that lateral violence in the workplace can result from what she calls "kick the dog" syndrome, as nurses who feel stressed and burned out may take out their aggression on fellow nurses.

Workplace bullying also can have a profound effect on care and safety when nurses feel that they can't speak up, Hawes says.

"If you're being bullied, you're silenced. You may not speak up for yourself," she says.

Traditionally, according to Hawes, nurses have not done a good job with talking about what they do, why their work is important, and why it matters.

"This study can help us understand how — who you are physiologically and how you respond to stress interacts with what your workplace is like," she says.

Hawes says she further believes this study can be a first step in helping the changing health care industry better understand the impacts of stress, burnout, and workplace bullying on job turnover, employees happiness, patient safety and patient satisfaction.

"I believe that empathy can be taught," Hawes says. "And I believe that we can develop workplace interventions that can improve performance and patient outcomes."



# DON'T WORRY, BE HAPPY



## Helping Children Overcome Anxiety

by Bruce Mason

Anxiety is a normal part of growing up, and all children experience it. But when it becomes extreme, anxiety can interfere with a child's well-being and happiness.

In most cases, anxiety experienced by children is temporary, and may be caused by a specific, traumatizing event. For example, a young child may experience separation anxiety from his or her parents on the first day of school.

Or, a child may watch a violent or scary show on TV and experience nightmares. In some cases, however, anxiety in children can be persistent and intense, and can interfere with a child's daily routines, such as eating, sleeping and concentrating in school. When anxiety in children proves unrelenting it can be diagnosed as an anxiety disorder.

"Anxiety disorders are one of the primary mental health problems affecting children and adolescents today," says Ellen Flannery-Schroeder, a licensed clinical psychologist and a professor of psychology at the University of Rhode Island (URI). "Given the wide range of stressors associated

with growing up, it is important that our children have appropriate skills for coping with anxiety and other difficult emotions."

Flannery-Schroeder has specialized in the cognitive-behavioral treatment (CBT) of childhood anxiety disorders for nearly 20 years. In 2004, she established the Child Anxiety Program in the Psychological Consultation Center at URI as a specialty treatment program for children with anxiety disorders. The Child Anxiety Program consists of approximately 10 therapists who are graduate students enrolled in URI's clinical or school psychology programs.

A large part of what inspires and motivates Flannery-Schroeder's work lies in her search for viable ways to overcome the difficulties associated with access to children's mental/behavioral health care. She says that despite a greater awareness with regard to the importance of mental health and well-being, access to services such as treatment and care remain limited.

"There are not enough treatment providers to meet the needs. The therapists who are available may not have the expertise necessary to address the individual problems of the child, which results in specialists having long waiting lists for treatment," says Flannery-Schroeder.





Ellen Flannery-Schroeder, Professor, Psychology, pictured center, with her students

She has directed much of her research toward developing treatments and approaches that enhance greater accessibility to such services as school-based prevention efforts, parent workshops and bibliotherapy for parents, which is therapist-assisted home study. In this case, the parents read a book to learn how to manage and respond to their children's anxious behaviors.

In treating a child with an anxiety disorder, a therapist can look at the symptoms, diagnose the specific anxiety disorder (i.e., Separation Anxiety, Generalized Anxiety Disorder, Social Anxiety Disorder, Obsessive Compulsive Disorder, Panic Disorder), and tailor a case-by-case strategy to help a child cope. CBT is a type of talk therapy in which children try out new ways to think and act in situations that can cause anxiety, and to manage and deal with stress. A therapist provides support and guidance and teaches new coping skills, such as changing self-talk, relaxation techniques, or breathing exercises. Sometimes, but not always, medication is used as part of the treatment for anxiety. CBT typically involves an average of 16 sessions during a 20-week period of time. Empirically supported, approximately 60 to 70 percent who undergo this treatment no longer have their primary anxiety disorder after treatment.

Although there is some research that suggests childhood anxiety is related to adolescent depression and substance use, it is difficult to determine precisely the leading stressors. In today's world, at the hands of modern technology, both children and adults are bombarded by images of tragic and violent events in ways never witnessed before. The 24-hour news cycle, smartphones and social media have the power to provide video feedback to make people feel as though they have personally experienced tragic events like shootings and natural disasters wiping out entire communities. According to Flannery-Schroeder, how we think about these events determines how we cope with anxiety that may arise. Controlling what and how we watch protects us from falling victim to anxiety.

"Take, for example, the 2012 Newtown, Conn. tragedy," offers Flannery-Schroeder, referring to the fatal shooting of 20 children and six adult staff members at the Sandy Hook Elementary School. "We can choose to place our attention on the single perpetrator of the terrible event or we might place our attention and focus on the millions of individuals who responded to the tragedy with overwhelming support in the form of kindness, emotional and material resources, dedication to righting the wrongs, and so on."

Parent training is an important part of Flannery-Schroeder's research as the proverbial saying states; the apple does not fall far from the tree. 60 to 70 percent of parents of anxious children are, in fact, anxious themselves. Children model their parents' behaviors, including those related to managing stress. Parents who deal with stress in unhealthy ways risk passing those behaviors on to their children. Alternatively, parents who cope with stress in healthy ways increase their own well-being and foster the formation of important habits in their children.

**"It is important that our children have appropriate skills for coping with anxiety and other difficult emotions."**

- Ellen Flannery-Schroeder

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Anxiety disorders tend to run in families. Researchers have concluded that 30 to 40 percent of risk for anxiety disorders can be attributed to genetics and the question of which specific genes is the focus of many research efforts<sup>1</sup>. According to Flannery-Schroeder, in the future, these genetic studies may make possible clinical tests for the presence of risk factors for anxiety. On this particular point, she says there exists fascinating research in the area of genetics that appears to suggest that certain stressful environmental conditions such as childhood trauma may be responsible for changes in the actual structure of genes, leading to the genetic disposition of anxiety<sup>2</sup>.

"This is certainly suggestive of preventative approaches to anxiety disorders," she says. "The field of epigenetics (the study of how environmentally-induced changes in genes can occur in the absence of changes to the DNA sequence itself) is fascinating and has the potential to help explain the gene-

environment interactions contributing to anxiety as well as other psychological disorders."

Relentless in her pursuits to create a greater awareness of child anxiety and a strengthened, more accessible support system for families affected, Flannery-Schroeder frequently conducts talks, workshops and in-services presentations to professionals, schools and parent groups on the identification and treatment of anxiety disorders in children.

Looking ahead to the future, Flannery-Schroeder asserts, "I think the field of psychology has a responsibility to better educate consumers of mental health services and, along with other advocates and policymakers, to raise children's mental health on the public agenda."

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2 Norrholm, SD & Ressler, KJ (2009). Genetics of anxiety and trauma-related disorders. *Neuroscience*, 164(1), 272-287.





# Right on TRAC

## Guiding College Students with ADHD to Succeed

by Bruce Mason

Conventional wisdom says that children outgrow attention-deficit/hyperactivity disorder. New research at the University of Rhode Island (URI) is changing that perception.

URI Psychology Professor Lisa Weyandt leads a multi-year effort to study the impact of Attention Deficit Hyperactivity Disorder (ADHD) on college students both during and after their college careers.

Weyandt found that there are few guidelines for clinically managing the rising number of students with ADHD on college campuses. In her 2013 published book, coauthored with Professor George DuPaul of the Lehigh University Department of Education and Human Services, "College students with ADHD: Current Issues and Future Directions" they report that high school students with ADHD are approximately eight times more likely to be dropping out of school and graduation rates of college students with ADHD are substantially lower than college students without the disorder.

Weyandt's five-year grant from the National Institutes of Health (NIH), Trajectories Related to ADHD in College, (TRAC), is the first to assess the educational, cognitive, social, psychological and vocational functioning of college students with ADHD compared to students without ADHD. TRAC hopes to understand the natural course of ADHD among college students and identify strategies for assessment and intervention.

Nationally and internationally recognized for her research concerning ADHD and her work with executive functions, Weyandt is the author of the aforementioned "College Students with ADHD", "The Physiological Bases of Cognitive and Behavior Disorders" and "An ADHD Primer."

In 2011, Weyandt completed the first double-blind placebo controlled study exploring the effectiveness of a prescription stimulate medication, Vyvanse, at reducing symptoms in college students with ADHD. The project was funded by Shire Development Inc. and findings were published in the *Journal of Attention Disorders* and the *Journal of Psychopathology and Behavioral Assessment*. Results revealed that Vyvanse was associated with substantial improvements in ADHD symptoms as well as improvements in several areas of cognition.

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“The findings will help to shed light on the specific needs of college students with ADHD, which will ultimately lead to appropriate interventions for these students.”

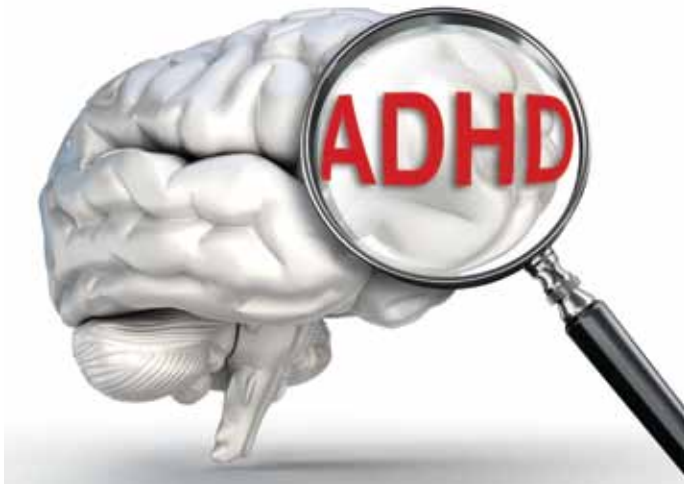
- Lisa Weyandt

A portrait of Lisa Weyandt, a woman with long brown hair and bangs, smiling. She is wearing a black button-down shirt, gold hoop earrings, and a gold bracelet. She is leaning on a light blue railing. The background is a blurred stone wall.

Lisa Weyandt

Professor, Psychology





Weyandt says more students with ADHD now attend college thanks to better special education programs in elementary, middle and high schools. Yet, data from her study shows these students are more likely to face additional challenges. The study's findings can help improve the likelihood that students with ADHD will graduate from college, thereby increasing their long-term chances for financial stability and positive mental health.

"The findings will help to shed light on the specific needs of college students with ADHD, which will ultimately lead to appropriate interventions for these students," she says. "Currently, stimulant medication is the most common treatment for college students with ADHD, but other non-pharmacological interventions may be necessary and beneficial for these students."

For the study, Weyandt joined psychologists DuPaul and Professor Arthur Anastopoulos, of the University of North Carolina at Greensboro Department of Human Development and Family Studies. Together they were awarded a \$3 million grant from the NIH to fund the first-ever study on how ADHD affects college students.

The study began in the summer of 2012, when a group of 210 first-year college students were recruited in two consecutive years for the study across colleges in Rhode Island, North Carolina and Pennsylvania. Each site was responsible for recruiting a total of 70 students — 35 students with ADHD and 35 without.

One of the unique and cutting-edge components of the TRAC Project features the gathering of real-time information as opposed to relying only on surveys and questionnaires. Through electronic means, the project collected information about students' academic and social activities.

One of the greatest adjustments students with ADHD make when they go to college is self-regulation. They become withdrawn from their familiar support systems (parents, high school personnel, treatment) and are suddenly managing their own lives. When added up, basic components of the average college life such as classes, assignments, time management, money, laundry and personal life can seem overwhelming. College students often will indulge in the temptations of campus life such as alcohol, drugs and sex as a distraction or perhaps as a means to self-medicate. Some begin to suffer from other disorders as well. According to Weyandt, more than 60 percent of the students in the study diagnosed with ADHD also have at least one other disorder.

"They have either depression or anxiety or other types of disorders, and that's compared to only 16 percent of the comparison group," Weyandt says. "So we know that these students are at great risk once they're here, and we're trying to understand their developmental outcomes, which ultimately will help develop interventions to increase the likelihood that they will succeed."

Weyandt's next project will involve conducting a pilot study in the spring of 2015 with Tara White, an assistant professor in behavioral and social sciences at Brown University, to explore the potential neurocognitive effects of a prescription stimulant among college students without ADHD. In a 2013 publication, Weyandt and colleagues found between 5 and 35 percent of college students misuse prescription stimulants and these rates vary across universities, regions of the United States, ethnicities, gender and social peers. Given that prescription stimulant misuse continues to rise among college students across the nation, it is critical to determine whether prescription stimulants enhance cognition or whether students simply believe this to be true.

Weyandt, says she hopes the results of TRAC and all of her studies will suggest better ways for colleges to understand and help students with and without ADHD.

One of the unique and cutting-edge components of the TRAC Project features the gathering of real-time information as opposed to relying only on surveys and questionnaires.



A photograph of a person sleeping in a bed, partially covered by a white blanket. A smartphone is lying on the bed next to them, its screen glowing with a bright light. The background is dark, suggesting a nighttime setting.

# Sleep Texting and the Fear of Missing Out

by Bruce Mason

Sleep deprivation has been considered a significant problem for college students, particularly first-year students whose transition to campus life can prove extremely stressful. When people are sleep deprived, they become less likely to succeed at both school and work. Sleep deprivation also is linked to rising rates of high blood pressure, obesity, behavioral problems, drug abuse, anxiety and depression. Research suggests that sleep problems during teenage and young adult years don't simply fade with age but, in fact, may continue to negatively impact health and well-being into adulthood.

Now, there is evidence of another offender when it comes to depriving students of sleep: texting. The texting phenomenon has even given birth to new lingo: *Sleep texting* is when a person text messages in the middle of the night during sleep, with little recollection of it the following morning. *Textese* is an abbreviated form of language used in texting, instant messaging, chatrooms, etc. And *sexting* is the sending of sexually explicit text messages and photographs between cell phones.

According to Sue Adams, an associate professor of human development and family studies at the University of Rhode Island (URI), students who leave their cell phones within reach while sleeping may be at a higher risk for depression and anxiety. Adams' work explores the connections between sleep and physical, psychological and social functioning. Her current research explores the negative impact of today's technological culture (e.g. texting, sexting, social networking and general cell phone use) on students' sleep quality, physical health and psychological well-being.

Along with Tiffani Kisler, an associate professor of human development and family studies at URI, Adams published an article on her research in *Cyberpsychology, Behavior, and Social Networking* in 2013. The article was based on a study in which more than 200 students completed questionnaires and week-long sleep diaries based on their nighttime activities. Results revealed that nearly 50 percent of those students reported sleep texting while 40 percent awoke to answer phone calls. The study found that students who woke up in the middle of the night to respond to text messages incurred a 45-minute "sleep debt."

According to Adams' study, students on the average already have a "sleep debt" of two hours each night due to a number of factors, including socializing, roommates, homework stress and worry. And despite the fact that her study suggests that college students need nine and one-quarter hours of sleep each night, they only get an average of seven. So losing those extra 45 minutes can prove even more debilitating to a student's well-being. In Adams' study, the students who had the highest rates of technology use also had higher levels of anxiety and depression.





Adams suggests that college students who have difficulty setting boundaries around technology use may also be at increased risk for psychological health concerns. "Fear of missing out," or FOMO, is a medical condition of extreme anxiety linked to high social media usage.

"Students who feel compelled to wake up in the middle of the night and answer texts and answer phone calls, you would imagine there's something about them that's driving them to feel like they have to stay connected," Adams says. "And for some of these students I think it really is anxiety — not wanting to be left out or feel like they may miss something."

In 2007, Adams founded URI's Sleep Research Lab. Her goals in establishing the Sleep Research Lab were two-fold: to conduct research examining the impact of technology on college students' sleep, physical health and psychological health, and to train undergraduate and graduate students in research.

Adams also provides clinical services to children and families experiencing an array of physical and mental health concerns. She utilizes a cognitive behavioral approach to treat children with anxiety disorders, sleep disorders, depressive disorders and other medical issues. Adams also is active in community outreach and regularly conducts workshops on the topic of childhood sleep disorders and anxiety. Her current research involves collaborating with Professor of Psychology Karla Murdock from Washington and Lee University to examine differences in outcomes in students from public and private universities.

"I am very dedicated to offering motivated students the opportunity to learn about the research process, with the hope that they continue on in graduate programs or jobs where they can apply their skills," Adams says. "In the future, I hope that I can expand the Sleep Research Lab to examine objective, physiological markers of sleep while offering overnight sleep studies. As a clinical psychologist, I am invested in helping individuals maximize their potential. One way to do that is to help people get better sleep."



**Sue Adams**, Associate Professor  
Human Development and Family Services

If you are a sleep texter or perhaps merely afraid of becoming one, the easiest and best solutions are the most obvious, advises Adams. Turn off your phone, set your passcode lock or place it on the other side of the room so it's not within easy reach. And if you need a wake-up call in the morning, then perhaps the best solution may be to buy an old-fashioned alarm clock.

"Students who feel compelled to wake up in the middle of the night and answer texts and answer phone calls, you would imagine there's something about them that's driving them to feel like they have to stay connected."

- Sue Adams



# TREATING Diverse Diseases

by Jamie Samons



Fatemeh Akhlaghi, professor & Ernest Mario distinguished chair in pharmaceuticals at the University of Rhode Island (URI), has a mission: to help reduce the incidence of alcohol use disorder by developing new medications.

"Twelve percent of Americans suffer from alcohol use disorder at some point in their lives and there are very few FDA-approved drugs for treatment," says Akhlaghi, adding that the United States leads the world in drug development, but the path from development to therapeutic use may take years.

A new program at the U.S. National Institutes of Health (NIH) encourages researchers to explore novel therapeutic uses for existing drugs, specifically for populations with unmet medical needs. Akhlaghi is convinced that people dealing with alcohol use disorder meet that criteria, and she is among the first researchers in the country to study drug repurposing with financial support from the NIH.

Akhlaghi and collaborator, Dr. Lorenzo Leggio, section chief at the National Institute on Alcohol Abuse and Alcoholism (NIAAA) and National Institute on Drug Abuse (NIDA) and Adjunct Associate Professor at Brown University, joined eight other research teams in securing funding in 2013 from the NIH's National Center for Advancing Translational Sciences (NCATS). NCATS was established in 2011 with the mission to deliver effective treatments to patients more efficiently by leveraging relationships among academia, government, industry and patient advocacy organizations. The research teams are focusing

on diseases as diverse as schizophrenia, Alzheimer's, muscular dystrophy, and, as in Akhlaghi's project, alcohol use disorder.

Akhlaghi specializes in diabetes research; Leggio focuses on addiction and alcoholism. Together, they have undertaken a review of the amino acid peptide ghrelin, traditionally associated with stimulating appetite and food intake. Akhlaghi and Leggio speculate that ghrelin receptor antagonism may represent a new treatment for patients suffering from alcohol use disorder. This grant follows previous research performed by Leggio proving that intravenous ghrelin administration acutely increases craving for alcohol in alcoholic individuals. Their \$1.65 million NIH grant studies the effect of an already-developed ghrelin-receptor antagonist to reduce alcohol cravings.

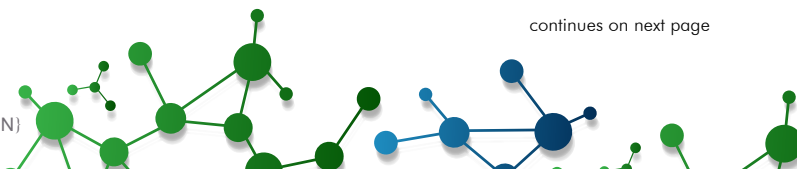
"Ultimately, I want to help develop a new treatment to aid people dealing with alcohol use disorder," Akhlaghi says, noting that her experience with diabetic patients greatly influences the work on this project. "When we develop a system whereby we can predict drug exposure in the patient, we are then equipped to individualize medication to each specific case. Not only do we enhance our chances of success with drug response, we also minimize adverse effects."

The NCATS chose Akhlaghi and Leggio's project due to its widespread applicability and promising potential.

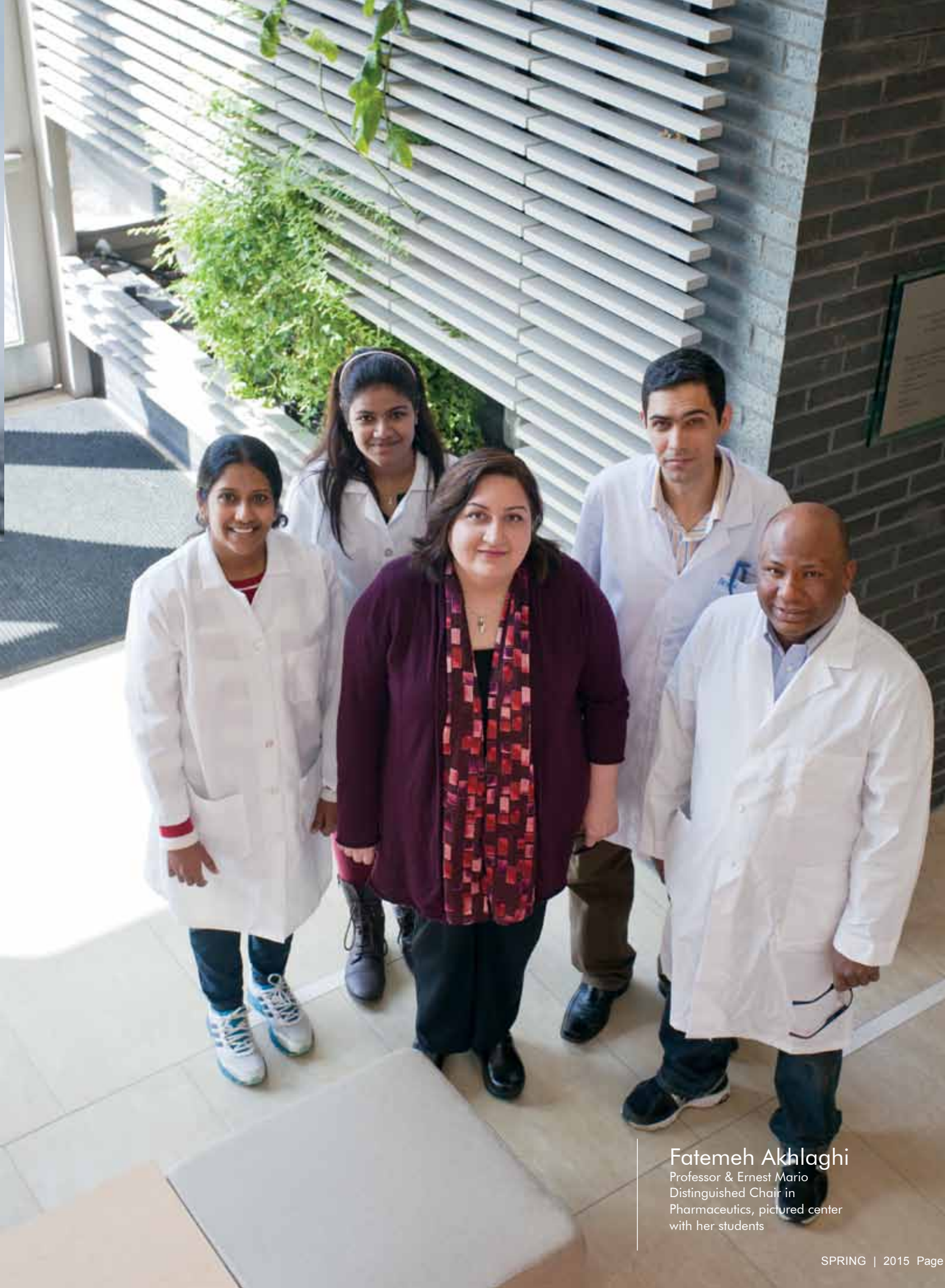
"The physical proximity of URI to the pharmaceutical centers of Boston and Groton enhances our research," Akhlaghi says.

In fact, the ghrelin-receptor antagonist at the center of their project was developed as a diabetes and obesity treatment by pharmaceutical giant Pfizer, in the company's Cambridge,

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**Fatemeh Akhlaghi**  
Professor & Ernest Mario  
Distinguished Chair in  
Pharmaceutics, pictured center  
with her students

Mass., and Groton, Conn., research facilities. Since the drug previously had been studied in human subjects, the feasibility and biological rationale for the new therapeutic use is high.

"Alcohol and food seeking behaviors share neurobiological mechanisms," Akhlaghi says. And, she adds, current medications for alcohol use disorder have not been widely successful.

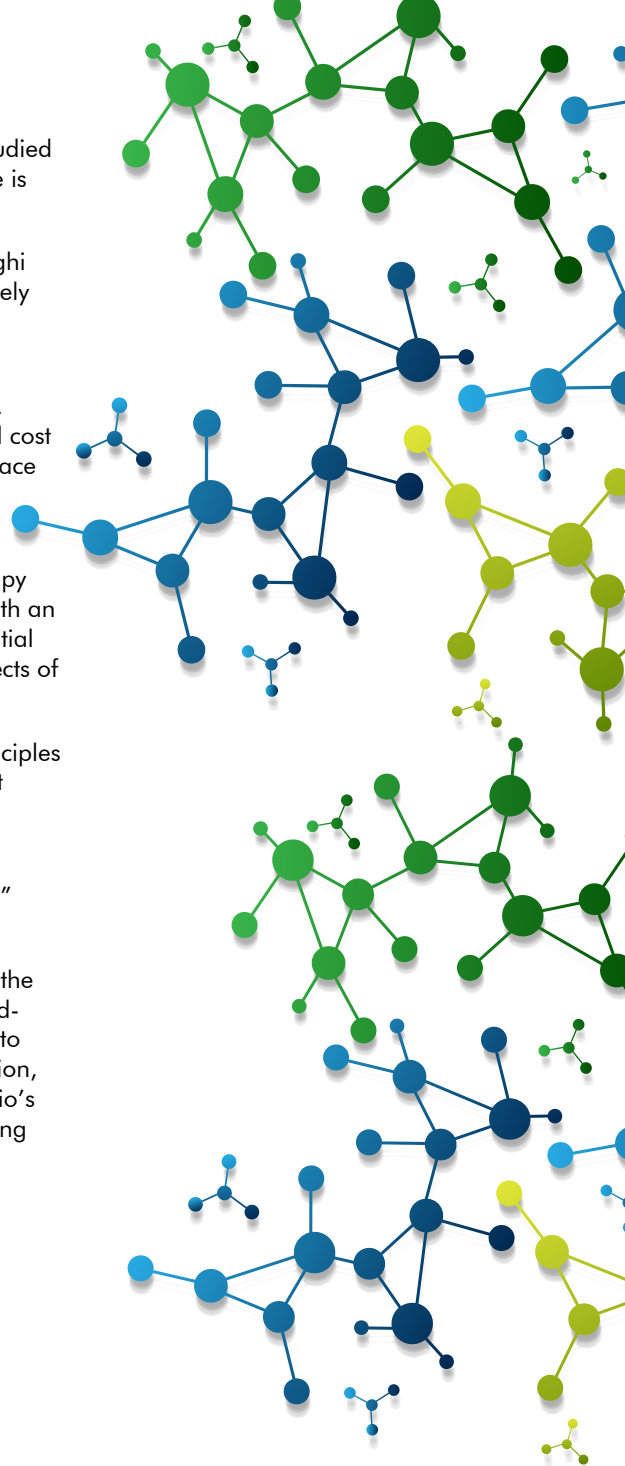
According to the NIAAA, nearly 88,000 people die from alcohol related causes annually, making it the third leading preventable cause of death in the United States. Alcohol use disorder affects about 17 million people in the U.S.; in 2006, the annual cost of alcohol use disorders surpassed \$223 billion, chiefly attributed to losses in workplace productivity, health care expenses and crimes related to excessive drinking.

Treatment approaches for alcohol use disorder have expanded during the past decades, moving beyond models based on 12-step groups to other behavioral therapy options and medications. However, according to NIAAA, only a fraction of people with an alcohol use disorder receives treatment. Akhlaghi and Leggio's project has the potential to help bring about positive change on the clinical, public health and economic aspects of the disorder.

Translational science focuses on understanding the scientific and operational principles of turning observations in the laboratory, clinic and community into interventions that improve both individual and public health, a goal Akhlaghi fully appreciates.

"Understanding the process, ideally, will facilitate the delivery of diagnostics, therapeutic tools, and medical interventions to the populations who need it the most," Akhlaghi says.

Since receiving the grant, Akhlaghi and Leggio have undertaken clinical trials on the drug in Leggio's NIAAA/NIDA lab at the NIH Clinical Center in Bethesda, Md. By mid-2015, the team expects to determine a "go/no-go" decision based on clinical safety to further develop an alcohol-related protocol for the drug. In the event of a "go" decision, Akhlaghi and Leggio will pursue a randomized controlled clinical trial based in Leggio's lab in Bethesda, using a larger sample of participants and introducing a neuroimaging component.



Researcher working in the lab

The research teams are focusing in on diseases as diverse as schizophrenia, Alzheimer's, muscular dystrophy, and, as in Akhlaghi's project, alcohol use disorder.





# An Eclectic Way with Words

by Paul Kandarian



To say that Mary Cappello's way with words is eclectic does not do justice to her

*writing.*

Of the four books Cappello has written to date, the University of Rhode Island (URI) professor of English and creative writing says, "I like to say each is a thought experiment."

Cappello explains, "I would never downplay the power of story, but narrative is not at the center of what I do. It's there, but I'm actually interested in putting non-narrative next to narrative, bringing things together presumed to be opposed. Can a new form emerge? Can a new way of looking at things emerge?"

Consider the books that Cappello has written. Her memoir, *Night Bloom*, is a multi-genre work that combines oral history, folklore, the bilingual journals of her Italian immigrant grandfather—who was a shoemaker by trade – dream work, letters and cultural theory.

Her second book, *Awkward: A Detour*, a *Los Angeles Times* bestseller, is a book-length essay that cuts across diverse subjects such as ontological discomfort,

stuttering, situational silence and the work and life of Rainer Werner Fassbinder, a German film director, screenwriter, actor. *Called Back* was her third book, looking at her experience with breast cancer, earning accolades that included an Independent Publishers Award in 2009.

Her fourth book was *Swallow: Foreign Bodies, Their Ingestion, Inspiration and the Curious Doctor Who Extracted Them*, about the work of pioneering laryngologist Chevalier Jackson, and his collection of nearly 2,000 foreign bodies he extracted non-surgically from the throats of people in the early 20th century, which are on display at Philadelphia's Mutter Museum.

Cappello is working on another book, forthcoming from the University of Chicago Press, about what she calls the ineffable subject of mood and its affinities with clouds, sonic atmospheres, sonorous envelopes and dioramas. She's also working on a series of linked essays,

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Mary Cappello  
Professor, English

"Waylaid by Interest," on the nature of interest and aversion, inspired by post-Swallow encounters, relationships and discoveries.

Cappello has won a Berlin Prize Fellowship that will have her in residence at the Hans Arnhold Center at the American Academy in Berlin for the fall 2015 semester. There, she will bring her most recent book to completion, *Life Breaks In: A Mood Almanack*, with special attention to mood's relationship to sound. As part of this project, she plans to explore specific sound installations and sound studies venues in and around Berlin. She will also pursue

collaborative work with international artists, scientists, and scholars in acoustic studies at the Universität der Künste and Humboldt Universität to address "mood rooms" as alternative performance and meeting places. Each year the Academy hosts approximately twelve outstanding fellows hailing from across the intellectual and cultural spectrum — history, economics, philosophy, literary studies, sociology — and from the worlds of public policy, the visual and literary arts, poetry, music composition, law, and journalism, with the aim of bringing America's best and brightest to create dialog and forge partnerships with intellectuals and writers in Germany.

Born and raised in Darby, Pennsylvania, a town just outside Philadelphia founded by Quakers, Cappello credits family as being influential in her becoming a writer.

"My grandfather was a shoemaker, but also a writer, a bit of a poet," Cappello says. "He left mounds of writing after his death, which my mother captured. And my mom's a poet, I grew up under her influence as well."

Part of that included gatherings at the home of Eileen Spinelli, poet and a friend of her mother's in the 1970s.

"She'd have groups at her house and invited kids to write poetry in her kitchen," Cappello says.

She never got a first inkling of the career she'd eventually have, she says, adding, "We are always becoming who we are. I'm still becoming a writer somehow."

She was drawn to the sciences early on, and had wanted to major in chemistry, and bring it together with English, to make it less dense, more readable and comprehensible.

"I knew science wasn't impenetrable," she says. "My friends had trouble because chemistry books weren't written well. I had a thing about wanting to write the first comprehensible chemistry book. But at Dickinson College, I wasn't excelling at chemistry. I was excelling in literature." Cappello always kept the sciences near to hand, and went on to develop a background in medical humanities.

She has never separated the researcher in her from the writer, and says one informs the other.

For every essay she has written, there is a file drawer of articles, essays and books she has read to deepen her understanding. That's the scholar in her.

In the early '90s, she was tired of



"We are always becoming who we are. I'm still becoming a writer somehow."

- Mary Cappello





poetry as a side dish. She wanted to create a writing that could infuse art and scholarship. A few things happened to make that transition into what she now identifies as being a writer of literary nonfiction, or lyric essay.

One was writing “My Mother Writes the Letter That I Dream,” an essay about her mother’s agoraphobia and her use of letter writing as a way of leaving the house. That led to her first book, *Night Bloom*. She presented at a scholarly conference — the MLA Convention — where members of the audience, several of whom happened to be in key editorial positions, conveyed a hunger for this new form of writing and encouraged her to write a book based on the piece.

“I stopped writing strictly scholarly articles and never looked back,” Cappello says. “I was fully immersed in the writing of literary nonfiction.”

When she came to URI, she found an open atmosphere that allowed her to focus on the relationship between creative and critical thinking. “There’s an embrace of it, encouragement of it. If you want to branch into different directions, you are going to be supported. You can grow and change.”

Her course offerings at URI are as varied as her books, and have included creative writing seminars and workshops in poetry and literary nonfiction; immigrant subjectivity and documentary discourse; and literature and medicine. And then there is the class called “literary acoustics,” which she says stemmed from her long-time interest in sound. At URI, she created “sound walks” for her students, a concept originally devised by a group in Canada. She has students chart a walk through known territory on campus with one rule: No talking, just listening.

“Then we come back and discuss the heard world,” she says. “It was fascinating.”

Students found themselves thinking—“is this the ideal environment for learning, or what it would be? People associate the history of learning with monkish alcoves and quiet, but a campus is a hum of generators and other noises.”

“I encourage beginning writers to identify the forms that the culture gives us to write with, and to re-invent those. If you follow conventions, you produce cliché,” she says, talking about her diverse style of putting words on paper. “You’re not going to find the truth of your experience.”

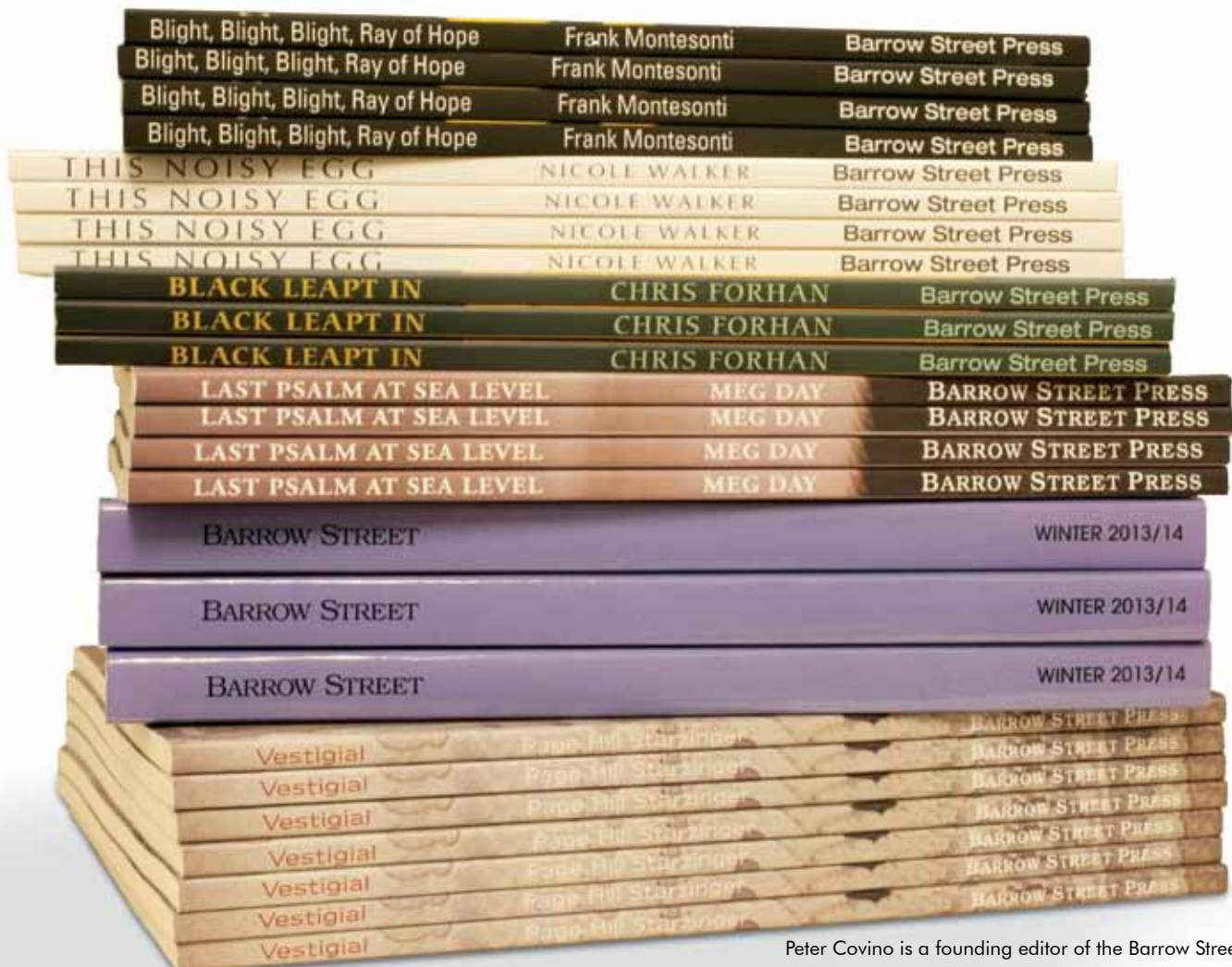


# POEMS

## Deconstruct Issues of Cultural Identity, Trauma and Loss

by Nancy Kirsch

An acclaimed poet, essayist and translator, with a gentle, thoughtful and welcoming demeanor contrasts with his poems that “name the unspeakable” — violence, loss, suicide, sexual abuse, family dysfunction and environmental disasters are among the complex themes his works explore.



Peter Covino is a founding editor of the Barrow Street Press.





Peter Covino

Associate Professor, English

Peter Covino, an associate professor of English at the University of Rhode Island (URI) says, "Words have a radical power to create new ways of reflection and understanding. Language's ability to name the unspeakable can be terrifically therapeutic."

## Infusing Cultures

Covino was three years old when arrived in the United States from Italy with his parents; he became a U.S. citizen two decades later.

His family spoke a polyglot Italian dialect with a strong Spanish influence, not the more commonly spoken Italian. Covino, who only heard that dialect at home, later studied Latin in high school and Italian in college. Covino's Italian heritage undeniably infuses and influences his poetry, thinking and sensibilities.

"My work straddles several different cultures; it's not just Italian, it's Neapolitan southern Italian culture, too," he says. "As someone who comes from this multicultural background — where Italian is the closest dialect to Latin — everything I hear in English that's not pronounced the way it should be in Latin seems to be an appropriation. You don't want to misappropriate people's experiences, why should you misappropriate their languages?"

In 1990, while working as a social worker at a hospice in New Jersey, Covino communicated in an Italian dialect with a dying woman who only spoke a Neapolitan dialect. "Just helping her to communicate, to understand—it was one of the most rewarding therapeutic experiences I've ever had," he says.

## Bearing Witness as a Poet

His evolution from social worker — his profession for 10 years — to poet is not as unexpected as one might imagine.

"When you do group therapy, you witness collectively," says Covino, whose poems are almost exclusively autobiographical, and rendered with unflinching candor and a deft lyricism.

In hearing clients share their pain-ridden stories — often filled with self-loathing — Covino came to realize the value of poetic expression of such confessionals. For many people it would be difficult to be vulnerable in writing about such intensely personal experiences as his sexuality, sexual abuse and dysfunctional family life.

"It was very risky; it's become less so over time," says Covino. "My book, *Cut Off the Ears of Winter*, addresses much of my experience as a victim of sexual abuse and around my queer identity."

"I'm feeling so grateful that people see it as the best work I've written."

- Peter Covino

DARIO BELLEZZA  
(translated from the Italian by Peter Covino)  
*from Inveniente e licenze (Invective and license), 1971*  
A Elsa Morante

I ragazzi drogati, guardie del corpo  
dell'Assoluto, vanno per il mondo  
mattutino fino alla sera della loro  
sopravvivenza: come passerotti  
mangiano distrattamente  
tutti presi dai loro sogni d'avventura.  
...sciagura che li coglie per strada  
...pienamente stecchiti  
...elle iene umane  
...ecrologi sui giornali.

To Elsa Morante

The drug addicts, bodyguards  
of the Absolute, roam the earth  
from morning until the night  
their final survival: like seagulls  
they eat distractedly  
seized by their dream

And the disaster  
and devoutly  
leaves them  
who write

Their  
their  
know



That poetry collection, which includes one poem by the same name, was published in 2005 by Western Michigan/New Issues Press and earned a prestigious Poets, Essayists and Novelists (PEN) American Joyce Osterwell Award for emerging poets in 2007.

"Twenty years later, in the book I am working on now, I deal with those issues much more directly," Covino says.

To some extent, Covino's experiences as a social worker in the fields of foster care and AIDS services informed *Cut Off the Ears of Winter*. Other poems of the collection shine light on a myth perpetuated by families such as his.

Covino says, "Saving face or not sharing secrets is a major cultural concept in families like mine. You

couldn't expose these sorts of things; you couldn't even go to therapy to talk about this stuff."

Despite the poems' painful subjects, Covino adds, "It became crucial to illustrate that the life of the poet is essentially a good one. Even in the middle of devastating abuse, a writer needs to reflect and meditate, to consider some of the merciful realities of the larger world."

## Playing with Puns

The multilingual Covino whimsically plays with words, while paying exquisite attention to how a poem looks and sounds on the printed page. Of *The Right Place to Jump*, his second collection of poems published by Western Michigan University/New Issues Press, he says, "There are a lot of sonic or sound-related puns throughout, such as substituting 'kingdom' for 'condom,' or playing with the links between 'Celan' and 'Ceylon.'"

Paul Celan, a Holocaust survivor and Covino's favorite poet, committed suicide in 1970 by jumping into the Seine River in France. In his poem, "Sri Lanka," Covino pays tribute to Celan, which phonetically is the same word as Ceylon.

"The book title also reminds readers that jumping into different poetic styles and accepting the range, has value," he says.

Peppering his comments with Italian and Latin phrases, Covino adds, "When I think of what's happening poetically, I literally look at every letter of the alphabet. I think about phonics, I think about the duration of vowel sounds, it's sort of a neurotic way of controlling the things in your life you can control. In poetry, every sound, every syllable, every image really matters."

Passionate about translating Italian poetry and essays, Covino is especially enthusiastic about translating the poems of the late Dario Bellezza, who wrote frequently about death and rebelling against societal conventions.

"Others are translating him; I'm in a competition," he says. "I'm happy that others are paying attention."

Covino has managed successfully to negotiate his time and energy, and strike a balance between his own poetry, translation work and teaching. He says he is pleased with his latest work, *Armies in the Blood*, a yet unpublished collection of poetry. Although Covino once believed he was done thinking about cultural identity and different kinds of family dysfunction, these new poems seek to understand the aggression that exists in us all.

"I'm feeling so grateful that people see it as the best work I've written," says Covino.

Covino, a founding editor of the literary press, Barrow Street Inc. and the Barrow Street Books, is also the poetry editor for VIA: Voices in Italian Americana. Covino's poems are published widely in the United States and Italy.

Eager to bring highly experienced and novice writers and readers together, Covino founded the Ocean State Summer Writing Conference — now in its ninth year — one of the University's most desirable creative offerings.

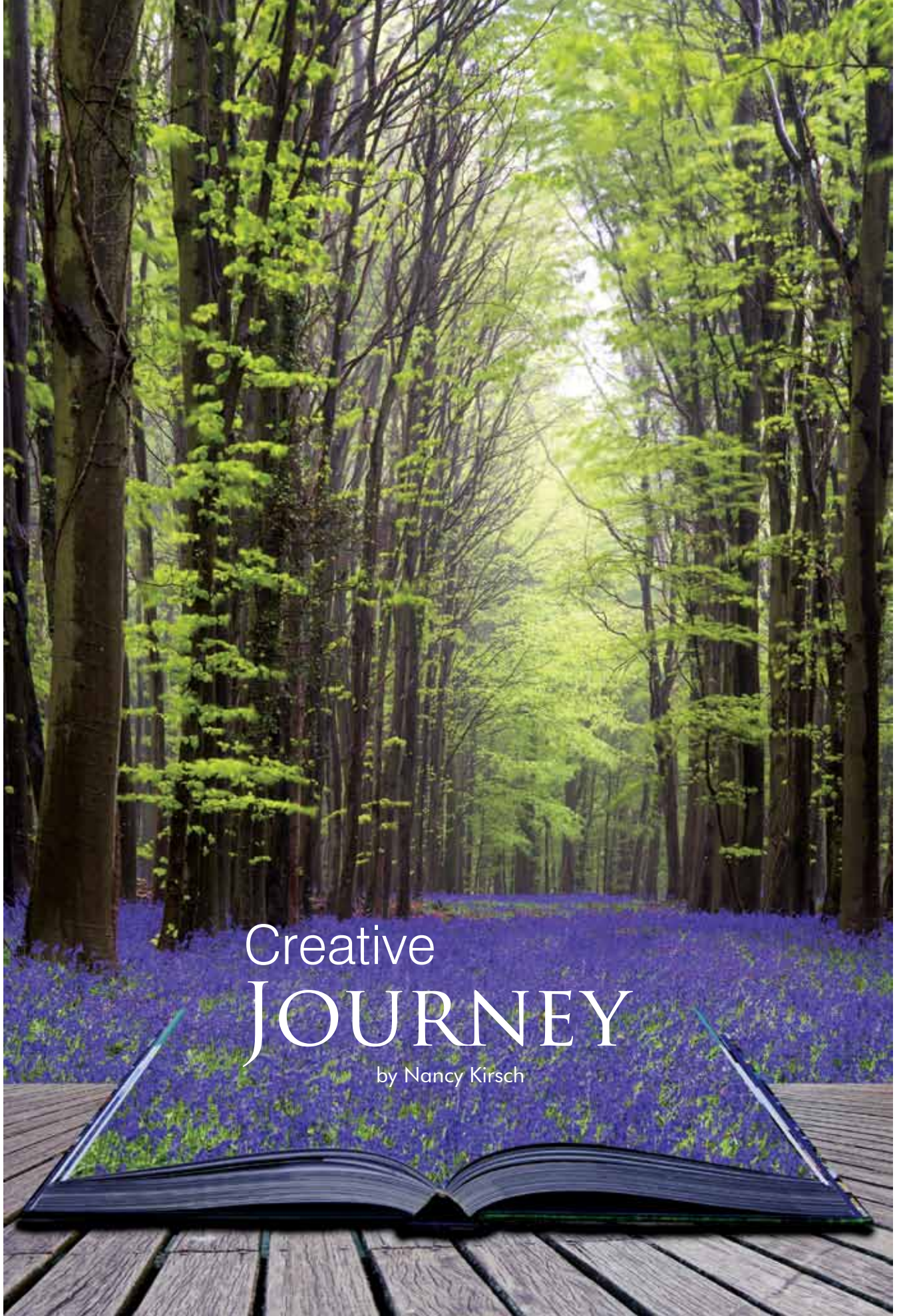
"Writing is not a small enterprise—people need to read you," he says.

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*"In poetry, every sound, every syllable, every image really matters."*

- Peter Covino





# Creative JOURNEY

by Nancy Kirsch



## For Josie Sigler, writing trumps virtually everything else in her life

"Writing is not a choice for me; it's number four after sleeping, eating and breathing," says Sigler, University of Rhode Island (URI) assistant professor of English.

Her fiction includes stories driven by narrative, experimental stories, and speculative fiction. Saying she finds it challenging to limit herself to any single writing project, Sigler confesses to always having a pile of ideas. Little wonder, then, that she has seamlessly produced works in diverse genres, including poetry, fiction and creative nonfiction.

"I'm always interested in what's next; I think my range is growing as I get older," she says. "Every project seems to have a voice that's specific to it. You just have to experiment and be patient enough to find that voice."

Sigler, whose parents divorced, grew up in a neighborhood riddled with poverty and violence. She says of her writing and those childhood experiences, "I survived because I knew if I did, I would tell the story, and telling it was evidence of having survived."

As a high school senior, Sigler was told to enroll in a trade school. Defying that advice, she graduated from the College of the Atlantic, earned her master's degree from the University of Maine and a dual doctorate in literature and creative writing from the University of Southern California.

The professor has garnered wide recognition: Her CV includes 46 writing awards and honors; 15 residencies, grants and fellowships — including a residency in Key West, Fla. April 2015 — and seven academic honors.

Her poetry chapbook, "Calamity", a series of poems written as letters between Calamity Jane and Annie Oakley, was published by Proem Press in 2009. Her book of poems, *living must bury*, represents the files of a taxonomer who falls in love with her subjects as she studies the conditions of their suffering. Published by Fence Books, *living must bury* won the 2010 Motherwell Prize.

Sigler's collection of short stories, "The Galaxie and Other Rides", depicts the ways in which life in post-industrial Detroit has left people—like Sigler's family members and neighbors—broken and hopeless. Published in 2012 by Livingston Press, "The Galaxie and Other Rides" received critical acclaim. The winner of the Ruby Pickens Tartt First Fiction Award in 2012, it was a nominee for The Story Prize, a Lambda Literary Award and the National Book Award.

Environmental crises and racism trouble Sigler, who wrote her dissertation on climate change, gender and race, focusing on literature that emerged from Hurricane Katrina. During a PEN Northwest Margery Davis Boyden Wilderness Residency in 2011, she lived in a homestead 800 feet above the Rogue River in ruggedly remote Oregon with just one solar panel and limited propane. There, Sigler worked diligently to live on her "fair share of carbon" — estimated to be one-half ton during her six-month residency, a 96 percent reduction of the carbon footprint of an average American.

"Putting my carbon where my mouth was, oddly, the best possible way to connect with other humans at a distance. I had to choose carefully, and that made everything more precious," she says. "I was never jostled out of writing, as I was alone without a single disruption for days on end, other than splitting wood, stoking the fire or tending the garden."

This experience enabled Sigler to begin to write short stories set in the West, a part of the country that her work had never before explored.

"The residency showed me how much I could turn a place that wasn't Michigan into a setting for a book," she said. "If I hadn't done that residency, I



Josie Sigler  
Assistant Professor, English

wouldn't have thought to set my next book in Rome."

Sigler's current project, *The Flying Sampietrini*, is about the corps of workers whose ancestors built St. Peter's Basilica and who continue to care for the church. The novel covers a century's worth of action, notably in Nazi-occupied Rome during World War II, and in post-9/11 New York City. Celestino Esposito, the main character, keeps a series of notes about his work during the war, which serve as an instruction manual to teach those who care for art how to live in times of struggle. He writes these notes for a future grandson whom he hopes will follow his career path, despite the fact that in the 1970s, the practice of nepotism ceased. In fact, Esposito ends up having a granddaughter who becomes an art conservator in New York City. She discovers these notes after the death of her father, Esposito's son; after 9/11, the notes provide her much-needed guidance about how to survive and how to care for precious objects.

For three months during late 2014 and 2015, Sigler was ensconced in researching and writing, briefly in New York City and then in Rome. She was able to do so with the support of a National Endowment for the Arts Fellowship, a URI Humanities Center grant and generous funding from URI's College of Arts and Sciences. Sigler expects that this novel, now in its second draft, will be published in 2017.

Although themes of intimacy, loss and violence permeate her works, Sigler explains, "I think some of my stories are actually incredibly hopeful. I hope my readers find connections with my characters that increase compassion and understanding around poverty and violence."

What does Sigler hope readers take from her work? Knowledge, compassion, and, perhaps, action, she says.

The support and understanding she received from her own college professors inspire Sigler's desire to provide her students, especially those from marginalized backgrounds, with a similarly transformative education.

"I never forget that I might be someone's lucky break. It shapes every interaction I have with students," Sigler says. "My greatest hope for students is that they will leave school prepared to change the world as they must."





# WHAT DO ARTISTS DO

by Paul Kandarian

Bob Dilworth's weathered face erupts into a smile at the mention of "The Naked Lady" he once painted as a boy.

"I always knew I was an artist, and artists do what? They paint naked ladies," laughs Dilworth, a University of Rhode Island (URI) art professor, as he sits in his Providence, R.I. studio surrounded by trays of paint, cans of brushes, and stacks of huge paintings leaning on walls, all works in progress. "I thought innocently it was a work of art, that I was doing something wonderful."

Dilworth's teacher thought otherwise. She sent the nervous third grader to the principal's office.

"She saw it as a) I was not paying attention," he says, "and b) I was drawing naked ladies."

But that's been Dilworth's life, drawing outside the lines, thinking outside the box, all reflected in his work that has been shown at URI, locally and nationally.

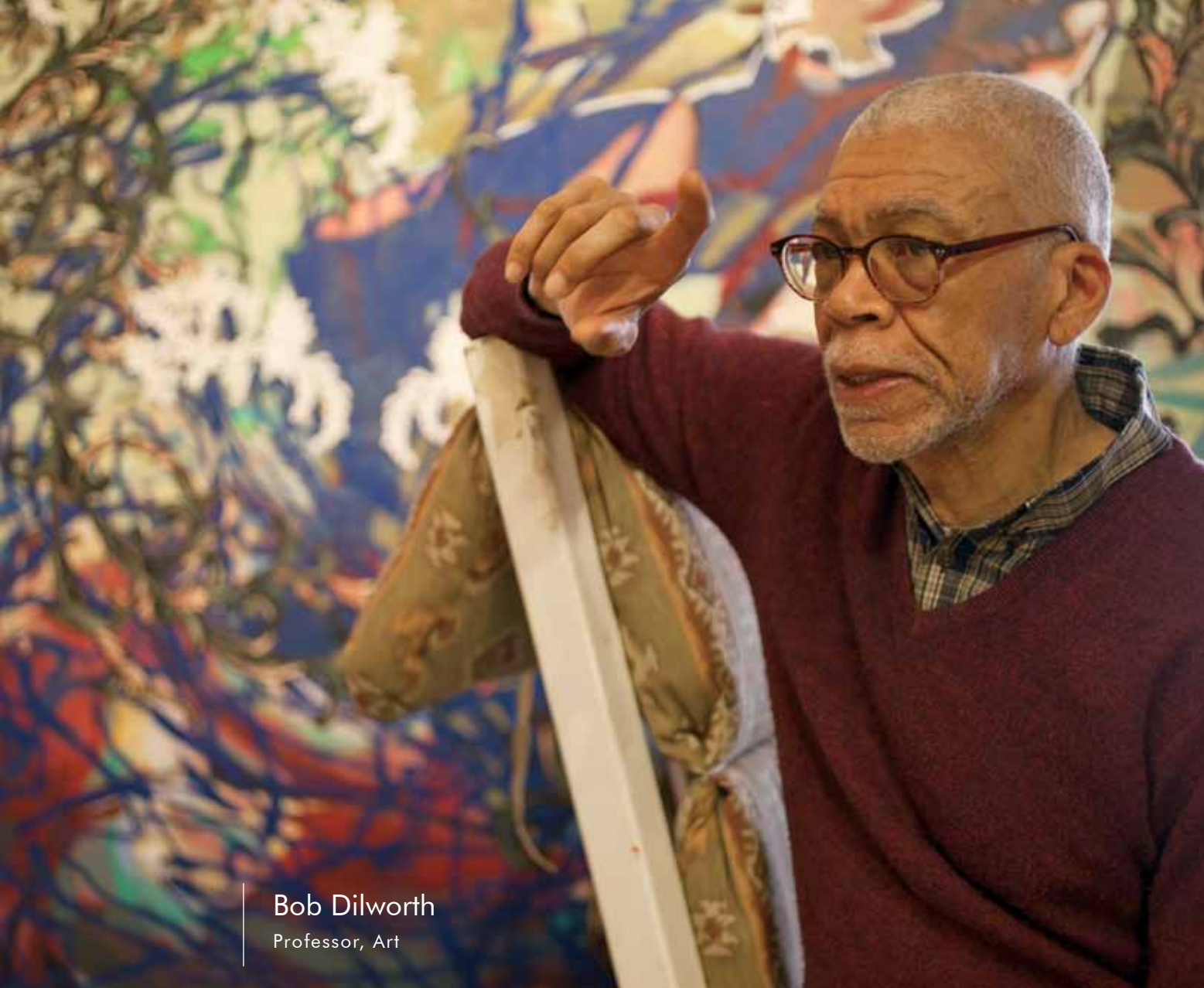
"Always have a cause," he says. "Even if you don't know where you're going."

Dilworth grew up in the tiny, largely African-American town of Lawrenceville, Va., which he says was isolated and insular in many ways.

"One of my childhood friends said we grew up in Camelot and didn't know it," he says. "Everything was there. We weren't rich, we weren't poor, but I didn't think we were missing out. It was a really happy time."

Dilworth received his bachelor of fine arts from the Rhode Island School of Design (RISD) in 1973, and his master in fine





Bob Dilworth

Professor, Art

arts from the Art Institute of Chicago in 1976. But prior to coming to RISD, he'd never heard of the school. His mentor, Yasue Sakaoka, told him to apply to RISD.

Mentors always played a part in Dilworth's life. When he was thinking about applying to Northwestern University to get another art degree, it was Sakaoka who told him "No, you're a painter. If you do this, you'll be forced to write and research. You should be painting."

It was another milestone in terms of advice for Dilworth, who is hard pressed to identify his style of painting, which he says has evolved, as he has, throughout the years.

"The closest thing you could say, without running the risk of categorizing or pegging it too tightly, is 'new media,'" he says.

He paints large scale, 87-by-67 inches, for the most part, calling it—meticulously composed human figures in homage

to the classical techniques of masters such as Caravaggio and Michelangelo.

He says he does more collaging now; the process is all about the fabric, paper cutouts, stenciling, transferring images, and layering, the way it comes together, layer over layer.

"If you say you're this or that, you hold to a false model of who you are," he says, pointing to the grand-sized paintings in his studio. "All the works you see here were seen at one point as completed, maybe several times. I come back and see something that could or should be done, or have a conversation with a friend who will say something that sets you in a new direction."

His work is handsome and complex, layers of stenciling and cutouts on original paintings. One is called "Margaret,"

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his mother, a handsome elderly black woman seen in repose amid a swirl of colors and flowers. Another is "Dan and James," friends of his in a loving pose done in acrylic paint, ink, fabric, lace, silk, paper and photo gel transfer on canvas.

He spends as much time as possible in his studio, relaxing on breaks in an oversized rocking chair. He teaches daily at URI, where he's worked full time since 1996.

"The art scene at URI," Dilworth says, "is very active, very lively. The department is small but that works to our advantage because we have very personalized relationships with our students. We work closely with them; we encourage interdisciplinary work, cross-pollination. They do photography, digital art and design, printmaking, painting, really enforcing this idea of new media."

Students learn from him, and he from them.

"It's important to keep your finger on the pulse of what's going on in our culture, and the best way is through the young folk I work with," Dilworth says. "I ask them a lot of questions. It's important to have young people who know what's going on, who have their ears to the ground about new things, new fashions, new expressions. Sometimes we miss it, we're of a different generation, our ideas get set and calcified in many ways. But for artists, it's really important to keep our eyes, ears and minds open to new trends and fashions."

Dilworth laughs when he admits until recently, "I didn't even know what a selfie was. So I used it as an assignment and it turned out to be incredible."

He also encourages his students to be rebels. To make decisions, don't listen to others, think out of the box, be crazy, do things that are wild and rambunctious and learn from themselves.

"What's important to me is coming out here and working," he says, rocking back and forth in that big studio chair. "I don't want to wow the world anymore. Maybe when I was 20 or 30 that was my goal, but at my age, just getting up in the morning, teaching and holding a paintbrush, is all I really want."





# Equal Rating OPPORTUNITY

by Chris Barrett

Americans annually spend some \$260 billion online. And, 90 percent of shoppers consult product reviews before handing over their credit card. To ensure the honesty of those reviews, University of Rhode Island (URI) computer engineering Associate Professor Yan “Lindsay” Sun and her students developed a simple online tool rooted in signal processing theory.

The tool allows shoppers to input the website address of a page containing product reviews on Amazon. In a few seconds, the site returns a creditability rating and details how it reached that score presented on a scale of 0 to 1, with 1 extremely reliable.

“Without this tool you have to rely

on Amazon and it’s not a transparent process how they check their reviews,” Sun says. “With this customers can make their own judgments.”

The tool works by sending the reviews through an algorithm that identifies patterns. After studying 240,000 reviews, Sun and her students determined reviews should not follow a pattern. There is no reason all reviews posted on Saturday should be positive. Nor should all positive reviews be from newly registered users, or come from a tiny subset of geographic locations. The team coined its findings the Equal Rating Opportunity principle in a play on words with the Equal Employment Opportunity principle in human resources.

The beauty of the principle lies in its simplicity. Traditional checks of reviews involve combing massive amounts of data across thousands of webpages. The process seeks to find anomalies like users that always post positive reviews or always for

one company. But that method relies on gaining access to non-public information and could take hours to process. The Equal Rating Opportunity principle instead needs only information any normal web surfer can see.

The principle caught the attention of the Rhode Island Hospitality Association, which contacted the professor after reading about her work in URI’s *QuadAngles* in 2014. Executives asked if the same principle could be applied to finding fraudulent reviews on Yelp that unfairly cost businesses like hotels and restaurants sales. Intrigued, Sun tasked a graduate student to investigate and, found, in short, yes.

By tweaking the algorithm, Sun and her student are building a system where business owners could analyze a negative review and get a scientific result about its validity. Armed with that information, based on URI’s independent algorithm, the business could petition Yelp to remove the review.

For example, in a blatant case, a



restaurant owner could use the tool to show all negative reviews came on a Tuesday and were all written by recently registered reviewers. The owner could then tell Yelp that based on URI's work something seems fishy, and add that the restaurant is closed Tuesdays. Other cases may be more subtle and based on a complex analysis of the review details.

"I think this is another way we can help not only the public but also small business owners," Sun says. "We provide the scientific results and they provide the context."

Sun never set out to research product reviews when she arrived at URI in 2004. She held an interest in trustworthy computing — the concept of ensuring that millions of interconnected devices are secure and not stealing credit card numbers or, say, shutting down the power grid.

With so much data today streaming through the air, Sun honed in on securing wireless networks. She started analyzing signals generated from network equipment. She found that by applying her expertise in signal processing, she could identify patterns. Devices that did not follow an expected pattern could be labeled as suspicious and throttled (slowed down or regulated) or blocked. Highly trusted devices could be given priority access.

Sun started thinking about how the theory could be applied to other areas in life. Then, one day shopping online for her family, it dawned on her that the concept could help her ferret out fake reviews.

"This is another case where social science helps computer engineering and vice versa," she says.

Online reputation management is a booming field. As Americans spend more and more time living and shopping in a virtual world the line between physical and online blurs. Sun notes customers who meet a saleswoman in person but cannot find her company online may question the validity of the business. Prospective college students exploring a high-tech program who find a rudimentary website apply elsewhere.

"Online reputation is getting connected to offline reputation," Sun says. "That's why our research is so exciting and important."



Yan Sun

Associate Professor  
Electrical, Computer and  
Biomedical Engineering



Providence VA Hospital New Medical Supply System

# LATEST IN SYSTEMS RESEARCH

## APPLIED TO THE PROVIDENCE VA HOSPITAL

by Chris Barrett

Engineers often think in terms of widgets. University of Rhode Island (URI) Industrial and systems engineering Associate Professor Valerie Maier-Sperdelozzi thinks in terms of human lives.

Since 2009, her research has led to improvements in patient care at the Providence Veterans Administration Medical Center, which serves some 35,000 patients annually. With the assistance of her students, Maier-Sperdelozzi applies the latest in systems research — usually associated with factories — to the VA hospital.

“The methods are the same either way, but the implications at the VA are more personal,” she says. “If you improve the efficiency of a manufacturing line by 10 percent, it improves the bottom line. If you improve the efficiency of a hospital by 10 percent, now my 3.5-hour doctor’s appointment is shorter.”

The VA faces immense pressure from politicians and the public to serve the nation’s veterans with speed and quality. By collaborating with the University of

Rhode Island, the VA staff members gain an outside eye with time to dig into issues.

“What the relationship has brought us is new approaches, new insights and new ways of doing things,” says Robert Harris, the systems redesign coordinator at the Providence VA. “Valarie and her students have a unique way of looking at things.”

When an architect proposed installing pneumatic tubes in a new wing to shunt around blood samples, a team of URI engineering students deployed at the hospital to identify the return on investment. They followed samples from the patients to the lab, noting who carried them, the route and even how long the carrier waited for an elevator. They sought to put a price tag on the current method of human carriers and delivered it to the architect. The hospital is still drawing up plans for the wing, but architects are leaning against a pneumatic tube system partly as a result of the URI study.

The hospital also implemented advice from Maier-Sperdelozzi and her students about how to stock medical supply closets. The new system of pullout shelves on wheels makes accessing supplies faster

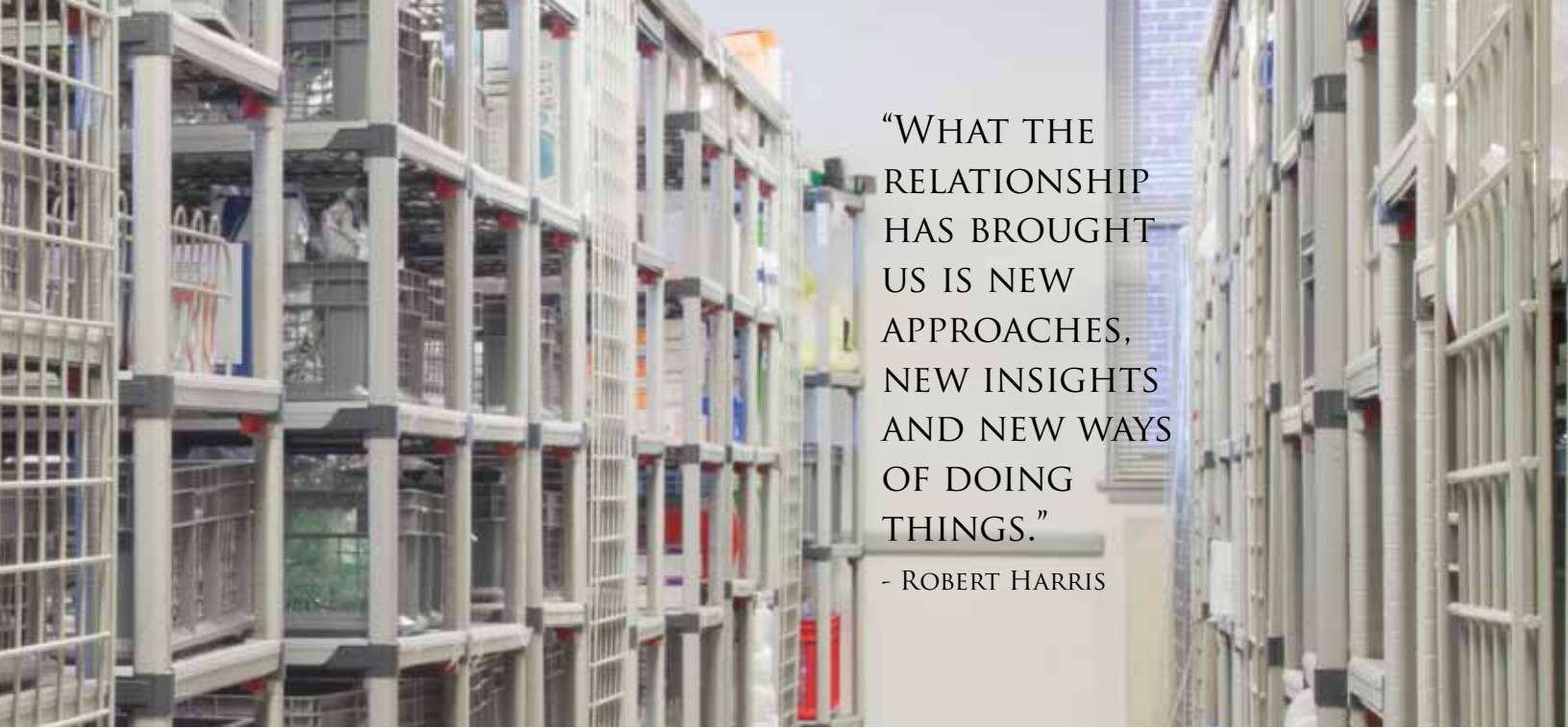
and restocking easier. In addition, by color-coding supplies by medical incident, nurses no longer need to waste time rooting around to gather all the supplies needed to treat, for example, a heart attack.

Meanwhile another project led by two doctoral students led many of the hospital’s 1,100 staff in workshops teaching them how to apply lean manufacturing techniques to hospital operations.

“Sometimes you encounter people who resist getting involved and see it as extra work,” Maier-Sperdelozzi says. “We’re showing them that the work can make their primary job of caring for patients more effective and even more enjoyable.”

The latest project includes URI industrial and systems engineering doctoral student Ahmed Alhasani. He wants to help the VA staff reduce the number of infections that occur in patients treated by the hospital. To do so, he’s studying new ways to collect, tabulate and report data on infection disease prevention measures. The hospital takes infection control so seriously that it studies minute details down to how often workers wash their hands. Now Alhasani wants to make that data easier for infection





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- ROBERT HARRIS

control staff to understand and use.

“From the industrial engineering perspective, we would love to help them understand how advanced statistics can help them,” Alhasani says.

Internally, the VA tracks infection rates at all its centers and allows local staff members to see how their center stacks up against others nationwide. With Providence’s relative modest size compared to other centers, even a few fewer infections can cause big swings in the infection percentage rates.

“That’s a lot of pressure,” says Brigida Cedeno, an infection preventionist at the Providence VA.

Cedeno says her staff appreciates the opportunity to work with Alhasani, who has little background in health care. While that may sound counter-intuitive, it means staff members start thinking about the assumptions they make when they present to wide groups of people at the hospital. In meetings, participants may be shy to ask basic

questions for fear of embarrassment. But Alhasani asks the questions and has the staff rethinking some of their presentations.

When staff members present, they also like to show data to motivate teams to work even harder on infection prevention. Cedeno says if Alhasani can develop better tracking systems that would make showing the results of those efforts clearer, it could encourage participation.

“We collect a lot of data, but the way to present it is sometimes not effective,” Cedeno says.

Alhasani says he’s confident given some time he can develop a more effective system. What he designs and learns will then serve as the basis of his doctoral thesis. He also plans to take the knowledge back to his native Saudi Arabia, which has dealt with major disease outbreaks such as the Middle East respiratory syndrome coronavirus.

When Alhasani graduates, Maier-Speredelozzi expects another student will take his place studying a new topic at the Providence VA. She’s never had a problem finding a student intrigued by applying industrial engineering at a health care facility.

“It hits home with people,” she says. “Most people can recall a health care experience that they wish had been better engineered.”



Valerie Maier-Speredelozzi, Associate Professor, Mechanical, Industrial and Systems Engineering, Ahmed Alhasani, Robert Harris

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