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OUR DEPARTMENT IS ABOUT... IDENTIFYING SOURCES OF DISEASE

AIR POLLUTION

A CONCERN FOR FARM KIDS, TOO

Asthma affects nearly 106,000 children in Washington state, with close to 5,000 in Yakima county. Researchers are investigating air pollution in an agricultural community in Yakima and its impact on kids with asthma.

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Air pollution tends to be thought of as an urban problem, not as an issue for agricultural areas, such as those in eastern Washington. Very little research exists about the health impacts of air pollution on communities around industrial-scale farming operations. Catherine Karr, an associate professor of pediatrics and environmental and occupational health sciences at the University of Washington, hopes to change that. Working with a farming community and local organizations, she is investigating air pollution in the Yakima Valley and how it may affect children who suffer from asthma.

This chronic disease affects nearly 106,000 children in Washington state, with close to 5,000 in Yakima county, according to estimates by the American Lung Association. Asthma causes inflammation and narrowing of the breathing air passages, which limits the amount of oxygen delivered to the lungs. Wheezing, coughing, tiredness, and shortness of breath are some of the symptoms, and without treatment, an asthma attack can lead to an emergency room visit or hospitalization.

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Concerned families and local health educators and providers turned to researchers in our department to find out if air pollution might be part of the asthma problem in Yakima.

Karr and colleagues gathered daily data on fine particulate matter from a monitoring station operated by the Yakima Regional Clean Air Agency. But they also needed to discover exactly what was in the air. Previous studies on urban air pollution point to traffic emissions as a primary component. Sources of pollution may look different in places like the Yakima Valley, speculated the researchers.

Yakima and Toppenish are small towns with big industry. Tree fruit. Dairy. Beef. Wheat. All of these can contribute to air pollution in different ways. Farmers protect rows and rows of apple trees with pesticides. Tractors harvesting wheat churn up dust clouds. Trucks carrying corn and beans run on diesel and drive on dusty country roads.

Michael Yost, professor and chair of our department, and others designed an air monitoring device that isolated specific contaminants in the air. Every six days, the device ran around the clock and collected samples of air that could be used to measure pollen, pesticides, dust, endotoxin (a component of certain bacteria that can cause an immune-system response), and ammonia emitted by animal waste.

Fourteen devices were placed at homes in the community and used to create a “map” of pollutant levels for all of the 58 children enrolled in the study.

Nearly all of the children were Hispanic, with median household income below \$30,000. For two years, health data on their lung function was measured daily using a special instrument, and control of asthma symptoms was assessed every two weeks in a phone survey. Annually, the kids’ lung function was also tested by health providers.

Only 26% of the children had consistently “well-controlled” asthma, based on reported symptoms and medication use. Yet, over the course of the study, all of the children improved.

Catherine Karr

Photo: Dennis Wise



“I think this reflects that kids and their caregivers in this study had a community health worker paying close attention to the child’s asthma status and received helpful education on managing their disease,” said Karr. Most people, however, “don’t have control over air pollution outside in their community or even in their yards,” she added. “This study can help facilitate more attention to the problems and motivate solutions.”

Karr said initial findings show evidence of more asthma symptoms and worse lung function following higher air pollution days. While she is in the process of publishing these findings, she is also evaluating one solution. She recently received a \$2.5 million grant from the National Institute of Environmental Health Sciences to examine the effectiveness of high efficiency particulate air (HEPA) purifiers in the homes of these children.

These studies are part of the El Proyecto Bienestar (The Well-Being Project), funded by the National Institutes of Health, which brings Hispanic agricultural workers and local organizations together with researchers to address the occupational and environmental health risks the workers and their families face.

Others involved include Christine Loftus (PhD, Epidemiology, 2014) and other researchers in our Pacific Northwest Agricultural Safety and Health Center, Heritage University, Yakima Valley Farm Workers Clinic, and the Northwest Community Action Center, which includes Radio KDNA. ■

SPECIAL COURSE ON FEBRUARY 27–28

occupational and environmental medicine in agricultural communities

Health care providers and public health professionals in rural and agricultural areas have expertise in their fields of specialty, but often desire networking opportunities and more information on current occupational and environmental health issues.

To meet their needs, a special course, “Current Topics and Best Practices in Occupational and Environmental Medicine in Agricultural Communities,” will be held at the Pacific Northwest University of Health Sciences in Yakima on February 27–28.

The course is composed of two half-day sessions that can be taken individually or together.

Day 1 will offer an overview of occupational and environmental health research on topics such as respiratory disease, birth defects, pesticide poisoning, sexual harassment, and heat-related illness. Workshops will provide current medical trends and preventive activities being used to address emerging risk factors and to treat diseases.

The training on Day 2 is aimed at clinicians and will cover the anticipation, recognition, diagnosis, treatment,

and prevention of occupational and environmental illnesses associated with pesticide exposures and musculoskeletal injuries of the lower lumbar spine. Returning injured workers to the workplace through the collaboration of employee, employer, and health provider via the Washington Centers for Occupational Health and Education (COHEs) will be a recurring theme.

The course is organized and sponsored by our department’s Continuing Education Programs, Pacific Northwest Agricultural Safety and Health Center, and Northwest Pediatric Environmental Health Specialty Unit as well as the Pacific Northwest University College of Osteopathic Medicine, COHE at UW Medicine Harborview Medical Center, COHE Community of Eastern Washington, and Migrant Clinicians Network.

Register online at <https://osha.washington.edu/course/current-topics-and-best-practices-occupational-and-environmental-medicine-agricultural>. ■

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SEATTLE'S

backyard chickens

PhD student investigates risk of Salmonella infection for owners

While no exact number of people who keep backyard chickens can be tallied, raising hens for eggs or as pets within the city limits is widely popular. A flock of one's own has obvious benefits, but there may be risks as well.

Heather Fowler, a PhD student in our department, is quantifying the risk of keeping live poultry. A trained veterinarian with an MPH in Applied Epidemiology and Biostatistics, Fowler investigated the potential risk from *Salmonella* to those who own backyard chickens. In the process, she also reminded owners about safe practices in caring for their flock. *Salmonella*, a diarrhea- and fever-causing pathogen, can lead to serious illness in young children, the elderly, and others with weak or compromised immune systems.

Last year, 363 people in 43 states, including Washington, were infected with *Salmonella* from live poultry, and one-third of those infected required hospitalization.

No one knows the consequences of *Salmonella* better than Bryan Prazen, one of the participants in Fowler's study. Years ago, he contracted it while in high school and was hospitalized for a month. Now a data scientist, he lives with his wife and son and raises four chickens.

In King County, hatcheries, feed supply stores, and other suppliers must post signs alerting customers to the risk of *Salmonella* infection from baby chicks, according to Leah Helms, a health and environmental investigator at Public Health – Seattle & King County. She provides businesses with resources, including posters, flyers, and an infection control plan. Hand-washing facilities or sanitizers are required near where chicks are on display to help prevent infection and the spread of germs. Retailers must also provide educational flyers to customers on washing hands to prevent infection.

"If you can quantify the risk of *Salmonella* from contact with flocks, that tells people a lot," said Fowler, who is busy analyzing the reams of data she gathered from 50 backyard flocks and their owners over the



Heather Fowler spent the summer investigating the potential risk from *Salmonella* to those who own backyard chickens. *Photo: Katherine Turner*

summer to create a quantitative microbial risk assessment, or QMRA. This mathematical model will measure the risk based on various activities involved in caring for chickens by estimating exposure, the concentration of the bacteria on surfaces, the likelihood the bacteria could cause illness, and safeguards in place to prevent exposure. She plans to publish her findings and share them with the study participants and others.

For study participants like Bryan Prazen who wanted to know if their flock had *Salmonella*, the story ends well. Fowler didn't find *Salmonella* in any of the backyard flocks.

"This doesn't change anything," Fowler explained when she called each participant with the results. She reminded them to continue to wash their hands, among other recommended care practices, because the tests she ran do not guarantee that their flocks will never have *Salmonella*.

The environment is always changing, explained Fowler. Bacteria are very sensitive to temperature changes, humidity, and rodents, attracted to stored chicken feed, can introduce *Salmonella*, too. ■

AN ECOTOXICOLOGICAL INVESTIGATION

downstream effects of pharmaceuticals and personal care products on fish

Chemicals in shampoo, toothpaste, and medicines are being detected in surface waters and fish nationwide, fueling suspicion that some pharmaceuticals and personal care products are causing ecological harm.

But research on the subject is limited; few facts are known about actual effects on aquatic life.

University of Washington researchers, working on a study funded by the Washington State Department of Ecology, are investigating the presence and effects of these chemicals in south Puget Sound.

“State and federal agencies are under pressure to identify specific compounds among thousands that may pose ecological risk. It’s a formidable task,” said Professor Evan Gallagher, who leads the study.

Over the next two years, his team will analyze 126 drugs and personal care products in fish and water samples, and study links between the chemicals and adverse effects in two species: juvenile Chinook salmon and Pacific staghorn sculpin.

The researchers are developing molecular, biochemical, and physiological indicators—biomarkers—to identify which species and sites may be at risk.

To test the variables, the researchers are comparing fish and water in estuaries downstream of wastewater treatment plants with fish and water farther away. They will also validate the biomarkers they find in the field-sampled fish with lab studies under more controlled conditions than conditions encountered by fish in the field.

In his 30-year career, Gallagher has investigated waterway pollutants, such as copper from automotive brake pads and flame retardants from furniture, and identified biological markers of injury that link exposure to fish fitness and survival. He has developed molecular and biochemical biomarkers that can detect the adverse effects of chemicals that originate from wastewater treatment plants and agricultural and industrial sources.

In a lab setting, a particular compound can adversely affect fish—for instance, in terms of growth or reproduction. In the environment, however, the exposure to that compound might be a thousand or a million times less, explained Gallagher. The compound’s mere presence may be less detrimental, if it is a detriment at all, to the animal’s health.

“We have to look carefully at the level of exposures that the fish are receiving, and then determine if those exposures are causing subtle effects that affect the animals’ physiology,” Gallagher said.

He is working with Andrew Yeh, a PhD student in our department and a member of the Gallagher laboratory. Yeh is playing a critical role in co-managing the logistical complexities of the project as well as developing innovative biomarkers of cell function as part of his dissertation. Other members of the team include Graham Young, professor of aquatic and fishery sciences; and James Meador, a research ecotoxicologist with the Northwest Fisheries Science Center. ■

Scientists sample at one of the sites in south Puget Sound.

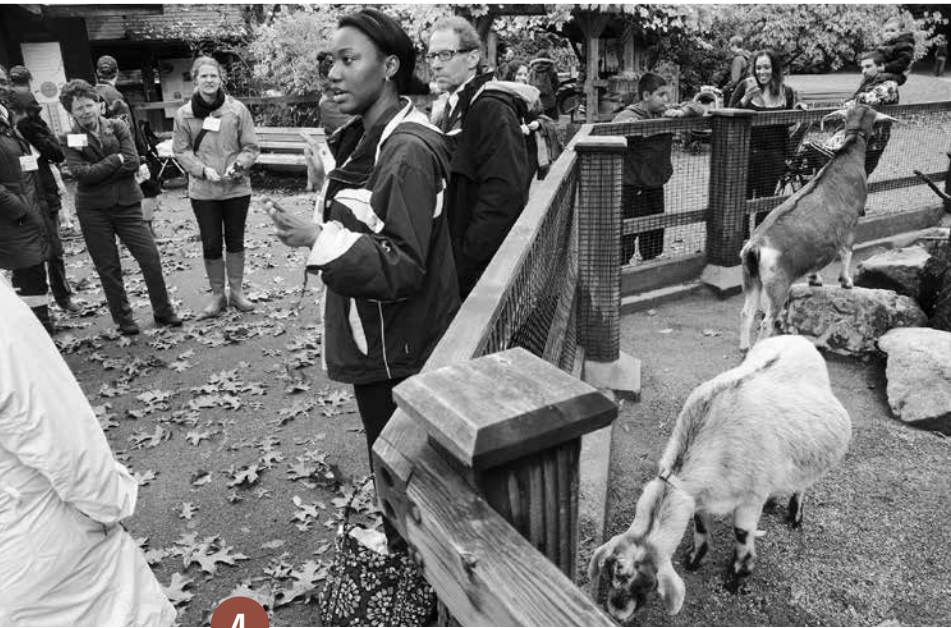
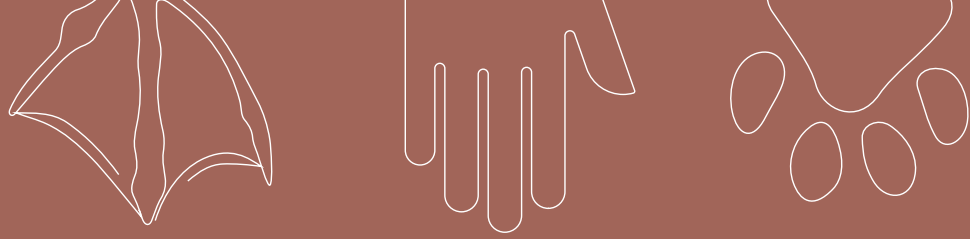
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ZOOBIQUITY 2014



1. Humans and animals get many of the same diseases. Yet, human health care providers, environmental health specialists, and veterinarians rarely have the opportunity to share their expertise with each other. The Zoobiquity 2014 Conference held on November 1 brought together these groups to discuss approaches and new findings about diseases and issues shared across species. The conference was sponsored by the University of Washington School of Public Health and School of Medicine, the Paul G. Allen School for Global Animal Health and College of Veterinary Medicine at Washington State University, and the Woodland Park Zoo. *Photo: Elizabeth Sharpe*
2. “Zoobiquity” signifies the connections that can be drawn between species and how understanding these connections can help better diagnose and treat patients—of all kinds. The term zoobiquity was coined by Barbara Natterson-Horowitz and Kathryn Bowers, who wrote *The New York Times*’ best-selling book by the same name and held the first Zoobiquity conference. Natterson-Horowitz (in photo) was one of the organizers of Zoobiquity 2014 along with Associate Professor Peter Rabinowitz, director of the UW Center for One Health Research; Darin Collins, director of Animal Health Programs at Woodland Park Zoo; and Gretchen Kaufman, assistant director of Global Health Education and Training at Washington State University. *Photo: Gemina Garland-Lewis*
3. Like the canary in the coal mine, sick animals can be sentinels of human health risks. The inverse can also be true: sick humans can signal environmental health risks to animals. Sick penguins in New York City’s Bronx Zoo signaled West Nile virus had arrived in the United States. Transmitted by infected mosquitoes, the virus can cause severe illness, even death, in both penguins and people. No Woodland Park Zoo penguin (in photo) has contracted West Nile virus. Sentinel cases provide early warning, and with proper communication and collaboration between human and animal health professionals, environmental health threats can be better detected and lead to a better response. *Photo: Elizabeth Sharpe*



4. At Woodland Park Zoo's Family Farm, Associate Professor Peter Rabinowitz, PhD student Heather Fowler, and Dale Moore (Washington State University) spoke to conference participants about the increasing popularity of farm animals in urban backyards, such as goats and chickens, and how both human health care providers and veterinarians need to be aware of the special health issues involved with close contact with such animals. These include the need to take precautions to avoid "zoonotic" infections (those passed between animals and people) as well as the psychological benefits of the human–animal bond. *Photo: Ryan Hawk/Woodland Park Zoo*

5. Tuberculosis is a highly contagious disease in both humans and large mammals like cattle. It usually attacks the lungs and is spread through the air from an infected individual. Diagnosis in humans can take up to a month because proper identification requires culturing the slow-growing organism from a sputum sample. Gerard Cangelosi (in photo), a professor in our department and the Department of Global Health, is investigating new sampling methods and faster and more reliable technologies to diagnose TB. *Photo: Gemina Garland-Lewis*

6. The cellular mechanisms affected by obesity that lead to detrimental health effects in people and their pets are curiously very different in the grizzly bear. The gluttonous bear can reach body fat compositions of 35–55 percent as it prepares for the months in hibernation. A man is considered obese if his body fat composition is over 25 percent, and a woman is obese if hers is over 32 percent. O. Lynne Nelson, professor of cardiology at Washington State University College of Veterinary Medicine, recently published a study that shows a bear's body doesn't act like it has gained this tremendous amount of weight before it experiences a period of dormancy. People with type II diabetes usually require oral or injected insulin lest the glucose broken down from metabolized food negatively affect major systems and organs. Yet, when a bear enters hibernation, its body shifts to become insulin resistant, which then allows the bear to draw upon its massive stores of fat over the winter months. Nelson said that a better understanding of these cellular mechanisms could improve therapies for people with diabetes. *Photo: Gemina Garland-Lewis*

NEW TOOLS FOR POLIO SURVEILLANCE COULD aid eradication efforts



Photo: Gabe Bienczycki, PATH

With \$5.3 million from the Paul G. Allen Family Foundation, researchers at PATH and in our department are developing two new tools to help detect the poliovirus—one for environmental surveillance and the other a diagnostic test. These tools may soon strengthen global efforts to eradicate the disease. Administered in partnership with the Bill & Melinda Gates Foundation, the grant will allow the PATH/UW teams to accelerate implementation of the tools in coordination with global partners.

Poliovirus is highly contagious, yet only about 1 out of every 200 infected people will experience clinical symptoms, which can lead to paralysis and, in rare cases, death. By the time symptoms appear, the virus may have already spread throughout, or even beyond, a community, which makes surveillance and early detection particularly important.

Immunization efforts have eliminated the poliovirus from most of the world. Yet periodic outbreaks occur. The virus can spread quickly, facilitated by sewage-contaminated floodwaters, infected travelers, and gaps in immunization coverage.

“Resurgence remains a risk,” explained David Boyle, a senior researcher who leads the study team at PATH and affiliate faculty in our department. “So we’re always asking, ‘Is the virus really no longer there, or are we just not seeing it?’ It’s also important for us to know when immunization is working. Good surveillance is crucial to monitor this approach and push the global eradication strategy forward.”

The US Centers for Disease Control and Prevention and World Health Organization lead a surveillance program that includes the Global Polio Laboratory Network (GPLN). These facilities coordinate with health workers who monitor the virus by collecting and testing water samples and by testing individuals who have symptoms that suggest polio infection. The PATH/UW tools, designed for use in low-resource settings, could significantly expand their efforts.

Because poliovirus is carried in human feces, sewage is an ideal place to look. Workers commonly collect wastewater or standing water and transport it to a laboratory,

where it is processed and prepared for testing. With support from PATH through the Gates Foundation, our researchers developed a device to improve this process. The bag-mediated filtration system is a simple, affordable, and effective all-in-one sample kit. It allows workers to gather and filter much more fluid, increasing the chance of finding any poliovirus present. It is also easier to transport and store, more hygienic to use, and could decrease the time required to process an environmental sample from one month to two days.

“Everyone wants to increase the amount of surveillance to pin down where transmission is occurring,” said Scott Meschke, an associate professor who leads the research team in our department. “If a bottleneck in the laboratory is hindering those efforts, then that’s a real problem. That’s a key rationale behind this project: to minimize that bottleneck.”

Tracking polio also requires tests that can quickly identify the virus in individuals. Testing rules the virus out or signals that a community is at risk of an outbreak.

Although effective diagnostic tests exist, specimens require shipping to specialized laboratories with trained staff. PATH is developing a simplified diagnostic tool to detect the poliovirus that is fast, reliable, and can be used in local laboratories without complex equipment. It can also test a relatively large sample volume, increasing health workers’ chance of finding even small amounts of virus. In areas where political unrest makes it difficult to ship samples to a GPLN laboratory, local testing could provide a crucial backup. In addition, the test may soon allow workers to identify different types of the virus, helping workers monitor and hone eradication efforts. ■

16-year tenure as chair

In August, Professor David Kalman stepped down as chair of our department, which he led for 16 years.

During his tenure, Washington state joined California in mandating cholinesterase monitoring, a surveillance program to protect agricultural workers potentially exposed to pesticides. Research on secondhand smoke led to new policies limiting smoking near businesses. The state's regulation of construction cranes increased after awareness of safety lapses was heightened by accidents like the 2006 crane collapse in Bellevue that killed a person and damaged three buildings.

These issues and many others—all linked to environmental and occupational health—speak to the importance of a department like ours and the need for effective leadership from the person at the helm.

“The department is recognized as being one of the best departments of its sort in the country. Whether we're talking about toxicology or industrial hygiene and safety or community environmental health or occupational medicine, we have strengths in all of these areas, and we have a reputation for being innovative and productive,” said Kalman, who most often lauds the contributions of others and is modest about his own. “I was very fortunate that during the time I was chair, I think what the department needed was a very good match for what I could do.”

Kalman has been key in maintaining a strong, stable academic program. While faculty have retired and left, he recruited more than 20 new faculty and created opportunities to retain senior faculty and staff.

When the department outgrew the space in the Health Sciences Building, Kalman oversaw its expansion into the building on Roosevelt.

During the same period, the undergraduate program suffered from very low enrollment, matching a trend seen around the country. “Part of it was that these were boom times economically, and people were not seeking additional training,” explained Kalman.

He took over the administration of the undergraduate program, heading it for the next seven years. Along with others in the department, he made substantial changes,

including a freshmen-level course to introduce environmental health concepts to students across campus. Under his leadership and with a committed faculty and staff team, enrollment in the undergraduate program grew substantially.

The importance of the undergraduate program has increased under the university's new financial model that apportions tuition dollars based on how many students are enrolled in a course, said Kalman. “It's encouraged every department to be less insular,” he added. “The incentive to appeal to a diverse academic audience of undergraduates is really healthy, particularly in a field like ours, where there's so much interest by people who don't necessarily want to be environmental health professionals.”

Sought out for his research and programmatic expertise, Kalman served on numerous oversight committees, advised the legislature on important health issues, and spent sabbatical time in Olympia. He has been a member of numerous accreditation teams that visited institutions in the United Arab Emirates and, at the request of the School of Public Health at the University of Namibia, he advised the school on adding environmental health training to its MPH program.

All the while, Kalman has maintained his own research program, including studies on the human health effects of arsenic that is contaminating drinking water in Bangladesh.

He remains on faculty and active in the department and in the state, particularly in the area of green chemistry, which aims to help reduce or eliminate hazardous chemicals and to minimize toxicity impacts. Kalman sits on advisory boards for Northwest Green Chemistry and the Washington State Department of Ecology to help devise a formal process for assessing chemical alternatives. He also plans to launch the first undergraduate course on the subject next fall. ■



Photo: Kathy Hall

Department faculty, staff, students, and alumni are highlighted.

In August, Professor **Kristie Ebi** joined our department and the Department of Global Health. Her work focuses on understanding sources of vulnerability and designing adaptation policies and measures to reduce the risks of climate change in a multi-stressor environment.

Professor **Lianne Sheppard** was awarded tenure. **Janice Camp** retired and is now emeritus principal lecturer; she remains active in the department. Promotions were given to **Kelly Edwards**—adjunct professor and **Sheela Sathyanarayana**—adjunct associate professor. **Won-Seok Choi**, **Sun-Young Kim**, **Anne Riederer**, and **Mary Schoen** were appointed affiliate assistant professors. **Grace Lasker** was appointed affiliate instructor. Other faculty appointments: **Harvey Checkoway**—affiliate professor; **Jennifer Lincoln**—affiliate associate professor; **Rodney Hoff**—clinical professor; **Deborah Havens**—clinical instructor.

Environmental Health Research Experience Program students presented at the UW Summer Symposium in August. They were: Paige Bommarito, University of Michigan; Tiffany Chou, Mount Holyoke College; Jeremy Cobbs-Hart, Clark Atlanta University; Megan Davis, Stanford University; Cole Story, Pomona College; Peter Wagner, University of North Texas; Allen White, Texas Southern University.

Associate Professor **William Daniell** co-authored an op-ed in *The Seattle Times* on the need for a multi-stakeholder task force to address health issues in the Duwamish Valley.

Graduate student **Trevor Peckham** did a 10-week Graduate Environmental Health internship at the Centers for Disease Control and Prevention where he worked on a project related to air emissions from US marine ports.

MS student **Laura Rascon Padilla** tested samples of commercial fish for mercury levels as part of her summer internship at the Washington State Department of Health. The information will help the state advise commercial fishers.

In September, concurrent master's degree student **Jonathan Nagata** received the "Best Student Poster" award at the International Water Association Specialist Conference on Watershed and River Basin Management.



Photo: Sarah Fish

DEOHS faculty, staff, and students helped organize, and volunteered and presented at the International Society for Environmental Epidemiology Conference in August at the UW, co-chaired by Professor Joel Kaufman. In photo, l to r: Chelsea Ruggiero-Diehl, Meghann Seiler Cheng (conference manager), and Taylor Hendricksen.

PhD students **Anna Engstrom** and **David Scoville** won first and third places, respectively, for poster presentations at the Pacific Northwest Association of Toxicologists' annual meeting.

In response to a new state law, our **Continuing Education Programs** offered a course in September for practitioners who work with chemotherapy drugs and other drug therapies on ways to reduce exposures.

Lecturer **Richard Gleason** appears in a video by the National Independent Contractors Association on the Global Harmonization System of Classification and Labeling of Chemicals under OSHA that will standardize the labeling of chemicals.

Dean **Howard Frumkin** was asked to serve on the Governor's Council for the Healthiest Next Generation, a new initiative focused on creating environments that encourage children to be active, eat well, drink water, and maintain a healthy weight. He also joined the Seattle Parks Foundation Board to help promote the health benefits of urban parks and green space.

Master's student **Jessica Levasseur** joined Dean Frumkin on a panel discussion during the SustainableUW Festival on how to address challenges in disciplines like environmental health.

Professor **Evan Gallagher** presented at the Northwest Green Chemistry Roundtable 2014 on the Molecular Design Research Network, a multi-university collaboration that is designing chemicals and materials to reduce toxicity.

Undergraduate **Vadim Motso** was featured by the Association of Environmental Health Academic Programs as an "Extraordinary Student."

The Human-Animal Medicine project, directed by Associate Professor **Peter Rabinowitz**, has a new name and status as the



Photo: Jeff Hodson

Center for One Health Research. One Health is an integrated approach to human, animal, and environmental health and involves professionals from multiple disciplines.

To better serve students, Undergraduate Program Manager **Trina Sterry** meets them in two locations—the Health Sciences Building and the new student center in Raitt Hall.

Lorelei Walker (Public Health Genetics) worked with the **Center for Ecogenetics and Environmental Health** (CEEH) and others to create an animated video on how the environment induces epigenetic change.

Professor Emeritus **Michael Morgan** received the William D. Wagner Award from the American Conference of Governmental Industrial Hygienists. The award is presented annually to a person in the field of worker health and safety who demonstrates commitment and dedication to the creation and dissemination of occupational exposure values.

PhD student **Boris Reiss** was selected to participate in the American Industrial Hygiene Association's 2014 Future Leaders Program Institute.

The fall Public Health Café, sponsored by CEEH, featured Associate Professor **Edmund Seto**, who invents devices to collect data for environmental health research.

Assistant Professor **Julia Yue Cui** was awarded nearly \$1.5 million over five years from the National Institute of General Medical Sciences to investigate how the gut microbiome influences nuclear receptor signaling and how it can also affect the various drug-processing genes in the developing liver.

Students across the Health Sciences were encouraged to read the common book, *Fresh Fruit, Broken Bodies: Migrant Farmworkers in the United States*, by Seth Holmes. Students continue to participate in activities connected with the book.



In August, Kristie Ebi took part in a by-invitation-only climate change and health conference in Geneva, Switzerland, hosted by the World Health Organization, where she provided guidance on implementing health protection from climate change.

Chair **Michael Yost** and doctoral student **Miriam Calkins** presented at the annual Pacific Northwest Climate Science Conference on research related to heat-health risks in the region.

In April, our **Northwest Center for Occupational Health & Safety** will offer a course on chemical design and predictive toxicology. The course is sponsored by Northwest Green Chemistry; Yale University, Molecular Design Research Network; and our department's **Sustainable Technologies, Alternate Chemistry-Training and Education Center**.

The department's **Future of Occupational Health** series continues, and a symposium is planned for June 24–25. Learn more at deohs.washington.edu/future.

Alumni News

The Peter A. Breyse Memorial Lecture was given by **Joe Coble** (MSPH, 1984) at the Northwest Occupational Health Conference in Richland, Washington, with a follow-up lecture in our department on October 16. Coble directs OSHA's Office of Technological Feasibility, Directorate of Standards and Guidance.

Rachel Wood (MS, 2014) is based in Lima, Peru, for a year, thanks to a National Institutes of Health-funded KUSKAYA Fellowship. She is researching climate change risks, focusing on ways that adaptation/mitigation strategies will affect economics, human health, and ecosystem services. ■

Chair **Michael Yost** and Professor **Joel Kaufman** shared research on traffic-related air pollution and health impacts of climate change with Governor **Jay Inslee** during his visit to south Seattle. Photo: Elizabeth Sharpe



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ISSN number 1548-1875

Printed by Johnson-Cox Company, Inc.

Check out upcoming events at
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February 25
Agricultural Safety Day, Wenatchee, Washington

February 27–28
Current Topics & Best Practices in Occupational and Environmental Medicine in Agricultural Communities, Yakima, Washington

March 11
Future of Occupational Health Speaker Series: Arne Kalleberg, Changing Organization of Work and the Future of Occupational Health, UW campus

April 2
Grand Rounds Occupational and Environmental Medicine Lectures: Jennifer Zumsteg, Diagnosis and Treatment of Concussion, UW campus

April 11
School of Public Health Day of Service

April 23–24
Design of Safer Chemicals and Products—The Nexus of Toxicology and Chemistry, Troutdale, Oregon