Charting the Future of Exposure Science

The US National Research Council of the National Academy of Sciences (NAS) released a major report offering a strategy to advance the future of exposure science. It includes a road map of technologic developments and strategic collaborations to move the field from a focus on single exposures toward an integrated approach that takes both human and ecologic systems into account.

Exposure science investigates the intensity and duration of contact of humans or other organisms with chemical, physical, or biological stressors and plays a fundamental role in the fields of public health, policy-making, commerce, and environmental protection.

The report introduces the vision of the “eco-exposome,” which builds on the exposome concept of comprehensively measuring all exposures, both internal and external, that people receive during their lifetime. The eco-exposome is an extension of exposure science into an approach that examines the effects of exposure not only on living organisms, but also the general environment and its ecosystems.

“We are still focused on the point of contact between the environment and the organism,” says Kirk R. Smith, chair of the NAS committee that authored the report. “But now we allow for measuring biochemical changes internally in the body as well as externally in ecosystems. Linking these levels, then, becomes a major activity of exposure science.”

The report also shows how advanced statistical methods and technologies continue to page 3
Environmental justice is a key concept for public health practitioners who are working to redress health disparities among low-income communities of color. Not only do these communities often have high-level exposures to pollutants, they also often have poor housing, lack of access to nutritious food, little green space, high crime rates, and poor access to health care. Thus, residents of such communities suffer from a “double whammy,” an unfair burden of hazardous exposures coupled with increased vulnerability to their toxic effects based on neighborhood characteristics. Directing the attention of policy makers to the problem of cumulative exposures in the context of environmental justice is an important contribution of COEH faculty members—Rachel Morello-Frosch, Michael Jerrett, and Amy Kyle—who work is highlighted in this issue of Bridges. These investigators do not stop at documenting the environmental health disparities faced by vulnerable communities. They also try to develop strategies to help change the built environment of these communities. For example, Dr. Morello-Frosch has been empowering residents of Richmond to recognize and measure exposures to hazardous substances in their community, and together with Drs. Jerrett, Kyle, and others, she has created a new summary metric for the degree of environmental inequity characterizing neighborhoods. Hopefully, more empowered community residents and better-characterized neighborhoods will help spur policy makers into action.

In addition to the will to act, policy makers need resources to implement effective programs. One new source of revenue to address community environmental health issues in California is a community benefits fund that will come from the auction of CO₂ emission allowances under the California Air Resources Board (CARB) cap-and-trade program. This program is a key component of the state’s overall approach to mitigate climate change as mandated by AB 32 (the California Global Warming Solutions Act). Many of the community-based organizations (CBOs) that advocate for environmental justice fought CARB’s decision to implement a market mechanism to put a price on carbon, cap-and-trade, instead of a carbon tax. These groups feared that heavy CO₂ emitters would simply buy allowances rather than clean up their facilities. This is a reasonable concern because facilities that emit high levels of CO₂ tend to emit high levels of toxic pollutants as well.

As the cap-and-trade program moved closer to the start of allowances auctions, many of the same CBOs that fought against the decision to go with cap-and-trade on environmental justice grounds formed a coalition to try a different tact. They supported legislative efforts to create a fund from auction revenues to be used for projects that benefit disadvantaged communities impacted by high pollution levels. Two bills that were recently passed by the legislature and signed by Governor Brown ensure that such a community benefits fund will be realized.

AB 1532 (Perez) established a public process and framework for the allocation of auction revenues. An already existing law created the Greenhouse Gas Reduction Fund (GGRF) in which revenues generated through the cap-and-trade program must be deposited. AB 1532 requires that the money in the GGRF be used to support environmental justice projects that also maximize economic, environmental, and public health co-benefits.

SB 535 (De Leon) requires that 25 percent of the GGRF be allocated for projects that would benefit areas disproportionately affected by pollution and suffering from high concentrations of unemployment, low levels of homeownership, high rent burden, and low levels of educational attainment. In addition, at least 10 percent of the GGRF must be allocated to projects in disadvantaged communities for programs to reduce pollution and develop clean energy.

Multiple organizations co-sponsored AB 1532 and SB 535, including the Greenlining Institute, Coalition for Human Rights, Environmental Justice and Health, California Rural Legal Assistance, and the California Environmental Justice Network. The bill was signed into law by Governor Brown on October 14, 2012, and the program is now officially known as “ubiquitous,” “embedded,” and “participatory” sensing, according to co-author Michael Jerrett. “Working with researchers at UC Berkeley, we have demonstrated the capacity to measure environmental exposures, and thus to foster decision making.”

The authors caution that, although technological opportunities will continue to emerge in the coming decades, many issues remain unresolved and are critical areas for research, such as the protection of personal privacy and the complex integration of different monitoring tools and data.

In a future report, Smith would like to examine potential changes in policy as scientists focus on exposure “hot spots” where people are most affected instead of general measures of environmental quality. He suggests that local influences such as secondhand smoke, proximity to roadways, and occupational hazards, for example, may prove more important to people’s health than low-level ambient exposures as the general environment becomes cleaner.

COEH members on the Committee include chair Kirk R. Smith, professor of Global Environmental Health at the UC Berkeley School of Public Health, Michael Jerrett, chair of Environmental Health Sciences also in the School of Public Health, Thomas McKone, adjunct professor in the School of Public Health, and Gina Solomon, deputy secretary for Science and Health at the California Environmental Protection Agency.


Global Energy Assessment — New Solutions for a Sustainable Future

The International Institute for Applied Systems Analysis (IIASA) published the Global Energy Assessment (GEA) in October, the first fully integrated energy assessment to analyze challenges, opportunities, and strategies for developing, industrialized, and emerging economies. The report, led by many of the world’s leading energy experts, establishes a benchmark of the current understanding of options for building a sustainable energy future. It also contains analytic tools to make the findings actionable by decision-makers that are both global and country-specific. COEH member Kirk R. Smith, 2012 Tyler Laureate and director of the Global Health and Environment Program at UC Berkeley’s School of Public Health, is a continuing to page 16
Costs for Occupational Injury and Illness Shift to Private Insurers and Tax Payers

The national price tag for occupational injuries and illnesses totals nearly $250 billion annually, yet only 21 percent of these costs, or $53.7 billion, are covered by Workers’ Compensation Insurance, a recent study from UC Davis has found.

Employer paid health insurance, Medicare, Medicaid, Social Security, and other payers absorb roughly 80 percent of the tab, or $198 billion. “Costs are being shifted from Workers’ Compensation to private insurance companies and tax payers, in addition to workers and their families,” says lead author J. Paul Leigh, who is a professor of Health Economics in UC Davis’ School of Medicine.

“Two hundred and fifty billion is a big number,” Leigh points out. “It’s more than the cost of cancer, yet when you look at research funding, cancer gets far more attention than job-related occupational injuries and illnesses. For example, the most recent budget for the National Institute for Occupational Safety and Health was roughly $300 million whereas it was $5 billion—17 times larger—for the National Cancer Institute.”

“From an economic stand point, if you are interested in spending your money where you will get the greatest return on investment, it makes sense to spend more on occupational health and safety,” says Leigh.

Lost productivity accounts for over $182 billion of the $250 billion annual price tag, with only $21.86 billion of this total paid by workers’ compensation insurers. Leigh says this cost-shifting of premiums from workers’ compensation to other sources leads to lower premiums and reduced incentives to promote workplace safety.

The survey found OHNs were most comfortable with employee medical evaluations of respiratory fitness. Overall, comfort with respiratory protection and years of experience were significantly linked.

A new pilot study led by Debbie Taormina and Barbara Burzel confirmed 87 percent of OHNs have a respiratory protection program at their workplace. They recruited forty OHNs for the pilot study, which was co-conducted with the American Association of Occupational Health Nurses (AAOHN) Northern California chapter.

Taormina developed a web-based survey to collect data on OHNs and their comfort level with key components of respiratory protection programs. The survey included a 12 item competency assessment and gathered information related to OHN experience, training, type of industry, how respondents motivated employees to adopt respiratory protection, and workplace roles and responsibilities.

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Global Energy Assessment — New Solutions for a Sustainable Future

Continuing from page 3

Global Energy Assessment: Toward a Sustainable Future

Key Findings: Summary for Policymakers: Technical Summary

Published at 1990 pages by Cambridge University Press, GEA draws attention to the need for clean cooking and electricity for the world’s poor, a primary subject of Smith’s research. The Preface reports that three billion people lack access to basic energy services and have to cook with solid fuels.

To view or download the GEA as a whole or by chapter as well as its technical summary and summary for policymakers, visit: http://www.iiasa.ac.at/web/home/research/researchPrograms/ Energy/Home-GEA.en.html.

OHNs at the Forefront of Workplace Respiratory Protection

Occupational health nurses (OHNs) are key players in the field of respiratory protection. As the largest single group of professionals involved in delivering health care at the workplace, OHNs are at the front line of assisting approximately five million U.S. workers who are required to use respirators on the job. 1, 2

Using data from the Bureau of Labor Statistics, the National Council on Compensation Insurance, and other government and non-profit sources, Leigh concluded that, in addition to $29.86 billion paid by workers’ compensation insurers for medical costs for occupational injuries and illnesses, workers and their families paid $5.81 billion, Medicare and Medicaid covered $12.63 billion, and other non-workers’ compensation health insurance covered $14.22 billion.

Leigh believes workers may prefer employment-provided insurance because filing a claim with Workers’ Compensation may leave a mark on their employment history.

The study, published in the April issue of the Journal of Occupational and Environmental Medicine, was partially funded by grants from the National Institute for Occupational Safety and Health.
Taking the Pain out of Dental Work

A study from the University of California Ergonomics Program is the first randomized control trial to show that decreasing the weight and increasing the diameter of dental tools used by dentists and hygienists may be a cost-effective way to reduce or prevent arm and shoulder pain. Up to sixty-one percent of dental professionals in the United States suffer symptoms in their right arm. Over time, ergonomic hazards can lead to reduced work hours, surgery, and disability retirement.

During the trial, dental professionals who used the lightweight tool also reported a reduction in their use of pain medication. In addition, their sleep improved. The number of nights they were awakened because of numbness in their right hand was cut in half, from two nights a week to less than one. The study, led by David Rempel, included 110 San Francisco Bay Area dental hygienists and dentists who routinely performed scaling, root planning, or dental prophylaxis procedures. Recruits were excluded from the study if they were receiving medical care for an upper extremity disorder.

Researchers provided approximately half of study participants with a set of ergonomically designed periodontal tools with a weight of 14 grams and a diameter of 11 millimeters (mm). The remainder received traditional, heavier instruments with a weight of 34 grams and a narrow diameter of 8 mm. Participants had no idea which features of the tool were being compared. Therefore, they were masked to the intervention.

For five months, participants completed a weekly online questionnaire where they reported pain of the right wrist, hand, elbow, forearm, and shoulder on a scale of zero to 10. The questionnaire also assessed their use of pain medication and how many nights they were awakened due to finger numbness in the right hand.

Pain scores improved more for those who used the lighter instrument with a larger diameter. The reduction in shoulder pain was the most pronounced benefit of the ergonomic tool.

“The outcome of this population study followed the results of our prior laboratory investigations,” said Rempel. “This confirms that our laboratory-based studies can predict health outcomes in larger population studies.”

Rempel, a professor of Medicine at UCSF and director of the Ergonomics Graduate Training Program at UC Berkeley, is lead author of the paper published in the October 2012 issue of the Journal of the American Dental Association, “The effect of periodontal curette handle weight and diameter on arm pain: a four month randomized control trial.”

Keynote Speech Links Neurological Disease with Occupational and Environmental Exposures

Thomas Sinks from the Center of Disease Control and Prevention underscored the influence of environmental and occupational health in neurological disorders during his keynote speech at UCSF’s Continuing Medical Education (CME) Update held from October 31 to November 3, 2012, at Holiday Inn Fisherman’s Wharf in San Francisco.

While delivering his address, the deputy director of the Agency for Toxic Substances and Disease Registry and National Center for Environmental Health recounted how U.S. legislation to phase out the use of lead in gasoline changed the course of childhood neurologic disease resulting from lead poisoning over the last century. At the same time, he raised awareness of the re-emergence of fatal lead poisoning in Nigeria where, since 2009, more than 400 children have died from mining and smelting lead-rich gold ore. The CDC is working with Nigerian officials to investigate and address this problem, he reported in his presentation.

In total, 125 health professionals, including nurses, physicians and industrial hygienists, attended the four-day event. Attendee James Moeller, MD, came from McChord, WA, to learn more about industrial-related exposures and health. In his position with the United States Army he finds noise induced hearing loss is an important issue for aviation workers. Others, like Michael MacLean, MD, from Hanford, CA, the Health Officer for Kings County, attended to widen their knowledge in occupational health practice and research.

The combined program of Occupational and Environmental Factors in Neurological Disease and Occupational and Environmental Medicine Update was co-chaired by COEH faculty member Paul Blanc, a UCSF professor of medicine, endowed chair, and division chief of Occupational and Environmental Medicine and Robert Kosnik, a UCSF associate professor and the medical director of Occupational Health Services in the Division of Occupational and Environmental Medicine.

COEH members who presented at the CME Update included Robert Harrison, Rupalis Das, Rachel Roisman, Barbara Burgel, and director John Balmes. Gina Solomon, deputy secretary for Science and Health at the California Environmental Protection Agency and a member of COEH’s Advisory Committee, also presented.

The event was supported with assistance from the National Institute for Occupational Safety and Health, the Society of Toxicology, the International Commission on Occupational and Environmental Health, the Southern California COEH, and the Council for Education and Research on Toxins, along with COEH at UC Berkeley.
New Methods Detect “Hotspots” of Cumulative Exposures in California Communities

Outdoor levels of particulate matter air pollution in Richmond are among the highest in California. The city is a busy hub of truck, rail, and marine transportation and home to Chevron Richmond, one of the major refineries in the United States. Yet it is the cumulative exposure to multiple stressors in this community such as noise, crime, and poverty, and their potential to amplify the health effects of specific exposures like air pollution, that now concerns scientists and policymakers.

The Northern California Household Exposure Study, conducted by UC Berkeley professor Rachel Morello-Frosch with colleagues at Brown University, Silent Spring Institute, and Communities for a Better environment, compared environmental exposures in a fence-line community bordering the Chevron Richmond refinery with a group of Bay Area homes located in rural Bolinas, California, where the air is cleaner.

She found measurements of indoor air pollution in Richmond were higher overall than in Bolinas. Higher levels of vanadium and nickel were also indicative of heavy oil combustion and shipping. In nearly half of the Richmond homes, measurements of particulate matter less than or equal to 2.5 microns in diameter (PM$_{2.5}$) exceeded California’s annual ambient air quality standard. Her findings provide new evidence that indoor air quality is an indicator of the cumulative impact of outdoor emissions from industry and traffic in heavily impacted neighborhoods.

Currently, the California Environmental Protection Agency (Cal/EPA) is strengthening its ability to screen the environmental health of California communities with an innovative tool under review by multiple stakeholders and the general public. “This tool is part of a larger plan that started in 2004 with the Cal/EPA Environmental Justice Action Plan,” explains Arsenio Mataka, assistant secretary for Environmental Justice and Tribal Affairs at Cal/EPA.

“Under that plan an environmental justice advisory committee – as well the Secretary and several of the heads of boards and departments – put forth a recommendation to evaluate and assess cumulative impacts. We charged the Office of Environmental Health Hazard Assessment (OEHHHA) to put together a working group consisting of industry, business, environmental justice groups, and academics. In 2010, OEHHHA released its report with a methodology to assess cumulative impacts for the State of California.”

The final version of the environmental health screening tool, termed CalEnvironScreen, is expected to be an important aid to Cal/EPA planning and decision-making. Potentially, it could inform decisions related to economic development to support communities heavily impacted by cumulative environmental pollution.

“We know these tools are not a substitute for environmental assessments,” says Mataka, “but they are a way to prioritize funding, clean-ups, and enforcement.”

“From a policy perspective, we have limited resources,” adds Mataka. “A tool like this not only could fulfill our environmental justice mandate, but it could also help us focus our time and attention on those areas of the state that appear to be in the greatest need.”

Morello-Frosch notes that, in the past, environmental justice communities have been identified when they mobilize to bring attention to their issues. “The problem is that there may be communities that have significant environmental health challenges or pollution sources with localized impacts, but the community itself doesn’t have the capacity to engage in the regulatory process.”

Cumulative impact screening could remove this burden of proof.

Mataka believes it is important to find those communities that may be suffering equally to some of the more historic environmental justice communities. “We have programs for education and outreach to build capacity in these communities to bring them to the level of others that have had resources and attention,” says Mataka.

New analytic methods and technologies are making it possible to accurately pinpoint cumulative exposure “hot spots” like those in Richmond where populations are disproportionally affected by multiple pollutants and other psychological and social stressors with the potential to affect health.

With funding from OEHHHA and the California Air Resources Board, Morello-Frosch and COEH co-investigators Amy Kyle and Michael Jerrett, along with research scientist Jason Su, were the first to publish a tool to summarize racial-ethnic and socioeconomic inequalities in cumulative environmental hazards, which they tested in Los Angeles County, one of the most ethnically diverse and polluted metropolitan areas in the United States.

They measured poverty and racial-ethnic composition to summarize social inequality at the census tract-level. To show unequal levels of pollution, they used measurements of nitrogen dioxide (NO$_2$), PM$_{2.5}$ and estimates of cancer risk associated with diesel exhaust from the Environmental Protection Agency’s National-Scale Air Toxics Assessment (NATA) model.

The greatest environmental inequities...
Environmental justice tools sharpen the focus on inequalities across regions. But in the wake of the Northern California Household Exposure Study, Morello-Frosch discovered community members in Richmond wanted to dig much deeper to assess local health and neighborhood issues.

With funding from the Avon Foundation, she worked with a student to help Communities for a Better Environment launch an environmental health survey that fully integrated local residents into the research process. Participants developed and implemented a questionnaire based on community-identified concerns in four neighborhoods likely impacted by mobile and stationary sources of pollution.3,4 They surveyed a total of 198 people, who provided data on 722 residents including 282 children.

The Richmond Health Survey, published in the October issue of Health, Education and Behavior, found that although residents thought their neighborhoods were good places to live, they were concerned about local stressors such as the prevalence of asthma among long-time residents and among children, where it is double the national average.5 Since the survey’s release, it has been widely used an outreach and organizational tool. For instance, residents presented their findings to the County’s Hazardous Materials Commission. “I think the timing of the Richmond survey has provided good impetus to fold in questions and concerns that communities identified into the process of updating the General Plan,” says Morello-Frosch. The key to making these screening tools work from a policy point of view, according to Morello-Frosch, is to develop an approach that is scientifically valid, but also transparent. “Ultimately, if community stakeholders trust the method, you are more likely to have better outcomes in terms of elucidating potential solutions to the concerns of environmental justice communities.”

Rachel Morello-Frosch is co-director of UC Berkeley’s Doctor of Public Health program and a professor jointly appointed in the College of Natural Resources and the School of Public Health. More information about the draft Cal/EPA tool is available online at http://oehha.ca.gov/cij/hipa73012.html.

COEH faculty Brenda Eskenazi received the John Goldsmith Award for Outstanding Contributions to Environmental Epidemiology from the International Society of Environmental Epidemiology (ISEE). The premiere award of the ISEE honors environmental epidemiologists who serve as models of excellence in research, unswerving promotion of environmental health, and integrity.

Eskenazi, who is the Jennifer and Brian Maxwell Professor of Maternal and Child Health and Epidemiology in the School of Public Health at UC Berkeley, received the award in part for her contributions to the field of environmental epidemiology through her work founding and directing the Center for Environmental Research and Children’s Health. Since 1999, she has directed a longitudinal birth cohort study examining chemicals and other factors in the environment and children’s health as part of the Center for the Health Assessment of Mothers and Children of Salinas project, or CHAMACOS. Among other findings, the landmark study has linked flame retardants to lower birth weights, associated the exposure of polybrominated diphenyl ethers, or PBDEs, to reduced fertility and altered thyroid function in women, and linked mothers’ exposure to organophosphate pesticides during pregnancy to shorter gestation and lower IQs in children.

At the society’s 24th annual conference in South Carolina, ISEE Past President Dean Baker praised Eskenazi’s impressive research credentials, noting that she has received international recognition for her work, that her research is a model that many others have followed, and that her publications were cited more than 700 times in the past year. Baker is an alumnus of UC Berkeley’s School of Public Health and the director of COEH at UC Irvine.

“I am very honored to be acknowledged by my colleagues and to receive this award in the name of John R. Goldsmith, a visionary and one of the founders of environmental epidemiology,” says Eskenazi. This annual award honors John Goldsmith, one of the organizers, early leaders, and constant supporters of the ISEE, who passed away in October 1999. Previous COEH members honored with the Goldsmith award include Irva Hertz-Picciotto and Allan Smith. The directors, faculty, and students of COEH wish to congratulate Eskenazi on her outstanding achievement.

Condensed from a press release by Linda Anderberg, UC Berkeley School of Public Health. The other two papers to share the award are “Prenatal Exposure to Organophosphates, Paraxoxonase1, and Cognitive Development in Childhood” by Stephanie M. Engel, James Wetmur, Jia Chen, Chenbo Zhu, Dana Boyd Barr, Richard L. Canfield, and Mary S. Wolff and “Seven-Year Neurodevelopmental Consequences of Prenatal Exposure to Chlorpyrifos, a Common Organophosphate Pesticide” by Virginia Raush, Srikesh Arunajadai, Megan Horton, Frederica Perera, Lori Hoepner, Dana B. Barr, and Robin Whyatt.

Two OHIP Interns Focus on Union Safety Issues were able to develop workplace improvements and training recommendations to share with union leadership.

Nazima El-Askari, coordinator of public programs for the Labor Occupational Health Program (LOHP), also coordinates OHIP. “While I hope these internships inspire a new generation of occupational safety and health professionals,” says El-Askari, “I am grateful to work with our interns as they inspire me as I continue my career in occupational health and safety.”

New Methods Detect “Hotspots” of Cumulative Exposures in California Communities continuing from page 9

were seen for diesel particulate matter cancer risk, followed by NO2 then PM2.5. Notably, the study showed that cumulative hazard inequalities were greater than for any single pollutant. The highest levels of cumulative impacts were found in downtown LA followed by the Long Beach port area.3

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Rachel Morello-Frosch is co-director of UC Berkeley’s Doctor of Public Health program and a professor jointly appointed in the College of Natural Resources and the School of Public Health. More information about the draft Cal/EPA tool is available online at http://oehha.ca.gov/cij/hipa73012.html.

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AIHA Honors International Outreach Initiative

The American Industrial Hygiene Association (AIHA) honored the Developing World Outreach Initiative (DWOI) chaired by UC Berkeley alumna Nina Townsend, M.P.H. ’11, a goal during her master’s studies to apply her industrial hygiene and Spanish language skills abroad. With mentorship from DWOI and COEH Advisory Committee member Garrett Brown, M.P.H. ’91, Townsend traveled to the Dominican Republic to work on a project led by the Worker Rights Consortium, a non-governmental labor monitoring organization from Washington, D.C. She surveyed a group of Dominican laborers who wanted to improve working conditions at their plant.

“You know on some level that things are worse in other countries,” says Townsend, “but you don’t know how bad they can be until you see it first-hand.” Townsend continues to work internationally in her role as an occupational health and safety specialist for Chevron where, most recently, she taught an industrial hygiene course in the Republic of Angola.

“The AIHA Northern California Section has been really good at outreach to younger members, bringing us in and getting us involved,” says Townsend, who now reviews project grants as a volunteer for DWOI.

Established in 2009, the Social Responsibility Award is presented by AIHA to an individual, entity, group, or organization who works inside organizations to develop and promote practical solutions to social responsibility issues related to industrial hygiene or environmental health and safety issues. Other recipients of AIHA’s award include the Maquiladora Health and Safety Support Network founded by Garrett Brown.


Luoping Zhang Appointed to the Carcinogen Identification Committee

Carcinogen Identification Committee, said COEH faculty Martyn T. Smith, a professor of Toxicology in the School of Public Health and principal investigator of the UC Berkeley Superfund program. “She has recently served on a number of committees of the National Academies and has made important contributions to our understanding of the carcinogenicity of benzene, formaldehyde, and other chemical agents.”

Zhang is a member of the Society of Toxicology, the Environmental Mutagen Society, the American Association for Cancer Research, and the Genetic and Environmental Toxicology Association. Her research explores the molecular mechanisms of bone marrow toxicity caused by exposures to toxic chemicals such as, benzene, formaldehyde, and trichloroethylene that are carcinogenic to humans.

Most recently, Zhang’s group has investigated the biological consequences of these chemical exposures in her current population studies by applying a novel System Biology approach employed with high-throughput array-based omic technologies.

Zhang earned a master’s degree in Biochemistry from the Huazhong University of Science and Technology in Wuhan, China, and a doctorate degree in Biochemical Toxicology from Simon Fraser University in British Columbia, Canada.

School of Public Health alumnus David Eastmond, PhD ’87, has also been appointed to the Carcinogen Identification Committee and alumna Tracey Woodruff, PhD ’91, has been appointed to the Developmental and Reproductive Toxicant Identification Committee.

A Snapshot of STEER Projects

Intern Andrew Budsock, an undergraduate studying ecology at Susquehanna University in Selinsgrove, PA, investigated the effects of flooding on the disease pathway of the liver fluke Opisthorchis viverrini in Khon Kaen Province, Thailand. His STEER mentor, Elizabeth Carlton, focuses her research on the re-emergence of the parasitic disease schistosomiasis in southwest China.

“Andrew helped us to develop a system to monitor flooding patterns in Northeast Thailand as part of a larger effort to understand waterborne disease patterns in the region,” explains Carlton. “Andrew’s skillful work with satellite images contributed to our understanding of physical activity.”

Intern Katharine Hammond, a Community Walkability Survey, which identifies obstacles to physical activity. Her mentors included COEH member Brenda Eskenazi and Daniel Madrigal. Eskenazi is the principal investigator and director of the Center for Environmental Research and Children’s Health. Madrigal is the coordinator of the Health Assessment of Mothers and Children of Salinas project, or CHAMACOS. Guerrero led sessions on scientific methods, research ethics, and survey design, and she also assisted the youth as they administered the survey. “Jaclyn’s enthusiasm helped motivate youth members as they learned about how neighborhood characteristics impact health,” notes Madrigal. “By training youth leaders in environmental health topics, Jaclyn’s STEER internship will be sure to have a lasting impact with the youth and within their community.”

Amanda Northcross, both from UC Berkeley’s School of Public Health. “Environmental health is not commonly taught at the undergraduate level and the STEER program has had tremendous success in enthusing students about the field. Interns have a great time in the program and it often refocuses their ideas about graduate studies,” says Bates. Undergraduate students can apply for 2013 STEER internships online. For information, visit: http://steer.berkeley.edu.
Letter from the Director
continuing from page 2

Clean Air, Asian Pacific Environmental Network, Ella Baker Center for Human Rights, Natural Resources Defense Council, the Environmental Defense Fund, to name but a few.

Now that the bills have been passed and signed the task is to see that they are implemented effectively and fairly. Cal/EPA has been working to draw maps that capture where disadvantaged communities are located throughout the state. As the cap-and-trade auctions continue to generate revenues, policy decisions regarding the allocation of these funds to community programs will be a critical focal point for public discussion about environmental health and justice.

2013 Lela Morris COEH Symposium

Save the Date!
COEH Past, Present, and Future

May 10, 2013
9:00 AM - 5:15 PM
Brower Center, Downtown Berkeley

Theme: Protecting Communities and Workers in the California of Tomorrow. Learning from Our Past and Building on Our Strengths.

Celebration Reception to Follow
5:30 PM - 7:00 PM

The Don Whorton Writing Award

New in 2013!

The Don Whorton Writing Award is offered by the Northern California Center for Occupational and Environmental Health. The award program strives to honor the late Dr. Whorton by encouraging and recognizing important new voices in occupational and environmental research.

Learn more at:
http://coeh.berkeley.edu/students/WhortonAward.html