

Superfund Research Program e-Posted Notes

SRP Annual Meeting Special Edition

E-POSTED NOTES SPECIAL EDITION: 2016 ENVIRONMENTAL HEALTH SCIENCE FEST

NIEHS EHS FEST and SRP Annual Meeting a Success

More than 1,200 people from across the nation joined in the first-ever [Environmental Health Science \(EHS\) FEST](#) Dec. 5 - 8, at the Durham Convention Center in downtown Durham, North Carolina. The FEST – Facilities, Engagement, Science, and Training – brought together a diverse group of researchers, community engagement teams, trainees, and young investigators supported by NIEHS. Held in conjunction with EHS FEST, the SRP Annual Meeting on Dec. 5, or “SRP Monday,” provided an opportunity for SRP grantees to catch up and highlighted the exceptional work of SRP trainees and investigators.

This special edition e-Posted Notes newsletter provides a recap of sessions, photos, and other moments throughout the week in Durham. Thanks to everyone involved in EHS FEST and the SRP Annual Meeting for making both such a success!

For a broad overview of the meeting, visit the [NIEHS Environmental Factor](#).

SRP MONDAY SESSIONS: DATA SHARING AND COMMUNITY ENGAGEMENT

Undertaking the Challenge of Data Sharing

A data science panel discussion explored data sharing opportunities and challenges. Boston University SRP Center Director **David Sherr** kicked off the session with a presentation on how data sharing can foster research potential in the environmental health sciences. He discussed why data sharing is critical in today's data-rich world and discussed challenges intrinsic to databases. University of California, San Diego researcher **Ilya Zaslavsky** then discussed data integration in the geosciences, including motivations, important considerations that need to be met in order to share data, and burdens. The panel also included Dartmouth College SRP researcher **Mary Lou Guerinot**, who spoke to sharing data related to plant biology, and **Allen Dearry**, the Senior Advisor for Data Science Technology and Sustainability at NIH, who provided feedback from the NIH perspective.



Data sharing was also a topic of conversation during the sensors and technologies fair. Zaslavsky, right, discussed his data sharing tool with SRP Director Bill Suk, left, and Christie Drew, from the NIEHS Program Analysis Branch. (Photo courtesy of Steve McCaw)

After the short presentations, a lively discussion ensued about the challenges of working with databases, quality control, and integration across several disciplines. Despite these challenges, the

panelists and participants highlighted the value of data sharing and emphasized the need to overcome data sharing barriers.

An Emphasis on Community Engagement

On August 5, 2015, 3 million gallons of acid mine drainage was released from the Gold King Mine in southwestern Colorado, eventually reaching the San Juan River – the lifeblood of the Navajo Nation. In an SRP Monday presentation, **Karletta Chief**, the University of Arizona Community Engagement Core leader, described her work to assist the Navajo people through partnerships with Navajo communities after the catastrophic mine spill. They have learned how the Navajo people have been affected by the spill and are working with Navajo communities to understand their exposure and risk perception, to improve awareness of the situation, and to help them build capacity to protect the river for future generations.



Northeastern SRP Center Research Translation Core leader Phil Brown, left, introduced Chief, right. (Photo courtesy of Heather Henry)

SRP MONDAY: HIGHLIGHTING AND REWARDING TRAINEE SUCCESSES

Wetterhahn Award: Elizabeth Martin

The SRP selected **Elizabeth Martin** of the University of North Carolina at Chapel Hill (UNC) as the 19th recipient of the annual Wetterhahn Memorial Award. At SRP Monday, Martin, who is pursuing her Ph.D. under UNC SRP Center Director Rebecca Fry, discussed her cutting-edge research on epigenetic mechanisms associated with health effects from exposure to metals. Epigenetic changes affect the function of DNA without altering the original sequence of amino acids. Read more about Martin and her research in the [NIEHS Environmental Factor](#).



NIEHS Division of Extramural Research and Training Director Gwen Collman, left, announced Elizabeth Martin, right, as the 2016 Wetterhahn Award winner. (Photo courtesy of Steve McCaw)

KC Donnelly Award Talks

SRP Monday included talks from seven [KC Donnelly Externship Award](#) winners, who described their experiences and results from an SRP-funded externship at another SRP Center or at a federal or state agency. The trainees described interesting and innovative research they were able to perform as a result of the KC Donnelly Award.

- **Kate Buckman (Dartmouth College)** measured a behavioral endpoint during her externship at the Narragansett EPA laboratory to examine the effects of maternal transfer of mercury on larval fish movement.
- **Marvic Carmona De Jesus (PROTECT at the University of Puerto Rico)** conducted his externship at the Oregon State University SRP Center to research the use of passive samplers so he could deploy those samplers in the northern



The 2015 KC Donnelly winners discussed findings from their externships. (Photo courtesy of Steve McCaw)

Karst aquifer of Puerto Rico.

- **Zhilin Guo (University of Arizona)** spent her externship at the UC Davis SRP Center, where she conducted a case study using a stochastic method to simulate contaminant transport in groundwater.
- **Erika Holland (University of California, Davis)** traveled to the Boston University SRP Center to investigate using killifish as a model to better understand non-dioxin-like PCB toxicity.
- **Miao Li (University of Iowa)** applied stable isotope labeling and protein profiling methods to identify protein adducts of PCB metabolites during his externship at the UC Berkeley SRP Center.
- **Lauren Redfern (Duke University)** traveled to the UC Berkeley SRP Center to develop a novel molecular tool to monitor the biodegradation of co-contaminants 1,4-dioxane and PAHs.
- **Lisandra Santiago Delgado (Oregon State University)**, who studies the formation of oxy- and hydroxyl-PANs during laboratory-scale thermal remediation of Superfund soils, conducted her externship at an EPA research laboratory in Ada, Oklahoma.

For more information about each winner, visit the [2015 KC Donnelly Winners page](#).

Reminder: KC Donnelly Applications are due January 31! See the [externship guidelines page](#) to learn more about applying for the award.

SRP SESSIONS AT EHS FEST

Interactions Between Environmental Toxicants and Food: Mechanisms, Interventions, and Risk Communication

This session explored interactions between food and environmental toxicants, looking at both mechanisms of toxicant transport into the food chain as well as how nutrition can mitigate toxicity of hazardous substances. Dartmouth College SRP researcher **Mary Lou Guerinot** described her work combining genetics, high-throughput elemental analysis, and high-resolution imaging to determine how arsenic accumulates in rice. University of Kentucky SRP Center trainee **Michael Petriello** discussed how exposure to PCBs can lead to increased production of a biological marker of cardiovascular disease, which is also linked to consumption of red meat, revealing a novel diet-toxicant interaction. **Daniel Schlenk**, an SRP R01 grantee at the University of California, Riverside, laid out a novel approach for estimating bioavailability, transfer of contaminants to fish, and human health risk of DDT-contaminated sediments off Palos Verdes, California. **Marcella Thompson**, from the Brown SRP Center, described a project with the Narragansett Tribe to



In addition to her talk during EHS FEST, Guerinot was also highlighted in Bill Suk's remarks for being elected to the National Academy of Sciences this year. (Photo courtesy of Heather Henry)

measure contaminants in local fish and report the risks and benefits of eating the fish to the local community.

Chemical Exposure-Induced Host Susceptibility: What Do We Know and Where Is the Science Leading Us?

A panel discussion explored possible common or unique mechanisms that may contribute to infection susceptibility across different exposures. The discussions also shed light on the gaps and future research needs to address this evolving health issue. Several SRP Center researchers presented and were involved in the panel discussion to follow. Dartmouth SRP Center Director **Bruce Stanton** discussed his research to examine the effects of low doses of arsenic on the innate immune response of the lungs to *Pseudomonas* infection. Louisiana State University SRP Center Director **Stephania Cormier** described her work demonstrating that exposure to radical-

containing particulates alters respiratory viral infection morbidity and mortality. **Fenna Sillé**, a former UC Berkeley SRP trainee who recently took a position at Johns Hopkins University, explained her findings on the long-term effects of early-life exposure to arsenic on immunity and tuberculosis risk.



The panel included SRP grantees Stanton, left, Sillé, second from right, and Cormier, right. (Photo courtesy of Steve McCaw)

From the Bench to the Field: Interventions and Technology-Based Solutions to Reduce Environmental Exposures

This session highlighted four SRP grantees with remediation technologies that they are transitioning into the field to prevent and reduce exposures to environmental hazardous substances. SRP R01 grantee **Upal Ghosh**, from the University of Maryland, Baltimore County, described new advances in contaminated sediment remediation by controlling bioavailability. Brown University SRP Center Director **Robert Hurt** described his work on nanomaterial sorbents for mercury capture and sequestration and graphene materials as components in vapor barriers. **Frank Loeffler**, an R01 grantee at the University of Tennessee, Knoxville, explained how he is unraveling the specific environmental conditions that sustain in situ microbial reductive dechlorination and detoxification of priority pollutants, such as TCE. University of Arizona SRP Center Director **Raina Maier** presented results from the first six years of a field study at the Iron King Mine and Humboldt Smelter Superfund site, demonstrating the feasibility of compost-assisted direct planting.

The Impact of Chemical Mixtures on the Environment and Health: Research Highlights Across Various Disciplines

This session highlighted a variety of NIEHS grantees from the SRP and from the NIEHS mixtures grant portfolio who share an interest in the study of chemical mixtures. **James Ranville**, an R01 grantee at the Colorado School of Mines, covered the use of *Daphnia magna*, a small planktonic crustacean, to detect, characterize, and assess the bioavailability of contaminant metal mixtures in the environment. Boston University SRP Center researcher **Jennifer Schlezinger** described her use of the Generalized Concentration Addition method to predict joint effects of co-exposures and to characterize the effects of co-exposures on the aryl hydrocarbon receptor, a protein in humans involved in a number of biological



SRP Program Administrator Danielle Carlin co-chaired the chemical mixtures session. (Photo courtesy of Steve McCaw)

responses.

Toxicant Transport Through the Environment: Mechanisms and Interventions to Prevent Exposures

This session addressed the complex field of fate and transport of contaminants in the environment and demonstrated how NIEHS grantees have successfully linked the science to the communities and stakeholders impacted by hazardous substances.

Andres Martinez, from the University of Iowa SRP Center, and **Wendy Heiger-Bernays**, from the Boston University SRP Center, described a collaborative community-based project to measure airborne PCBs in New Bedford Harbor, Massachusetts, using passive sampling devices. University of Kentucky SRP Center researcher **Kelly Pennell** and SBIR grantee **Bruce Richman**, from Entanglement Technologies,

described their collaboration to conduct a field study to advance the understanding of spatial and temporal variability of TCE concentrations in sanitary sewer systems located near hazardous waste sites. R01 grantee **Michael Unger**, from the Virginia Institute of Marine Science, and collaborator **Joe Rieger**, from the Elizabeth River Project, shared data from the use of a biosensor to assess the impact of groundwater-surface water dynamics on the effectiveness of remediation and bioavailability of PAH contaminants. Brown University SRP Center researchers **Jennifer Guelfo** and **Thomas Marlow** described a workshop they held for regulators regarding perfluoroalkyl acids. At the workshop, they identified key fate and transport knowledge gaps, which now have been incorporated into Brown SRP's research initiatives.



Martinez, right, and Heiger-Bernays, left, take questions about the data they are collecting and sharing in New Bedford Harbor. (Photo courtesy of Heather Henry)

Beyond Bench to Bedside: Stories of Translation

The NIEHS supports translational research through many programs, including the SRP, to discover how the environment affects people in order to promote healthier lives. In one of the plenary sessions, presenters described their views of translational research and highlighted key aspects of research translation through four stories celebrating NIEHS's investments over the years. UC Davis SRP Center Director **Bruce Hammock** described how universities are doing technology transfer and emphasized the importance of keeping an open-source mentality while developing intellectual property through small business programs. **Julia Brody**, executive director of Silent Spring Institute and a Northeastern SRP Center collaborator, described research into breast cancer environmental factors and prevention after activists raised questions about why breast cancer risk is higher in some regions.



Hammock, center, catches up with former SRP Program Analyst, Beth Anderson, and NIEHS Program Administrator Dan Shaughnessy. (Photo courtesy of Steve McCaw)

SRP PRODUCTS FEATURED AT EHS FEST

SRP Grantees Well Represented at Film Festival

The EHS FEST Film Festival at the historic Carolina Theatre in Durham featured films developed by

grantees, partners, and NIEHS staff. These films, selected from more than 40 submissions, raised awareness on a variety of environmental health topics and served as a unique opportunity to share environmental health messages with meeting participants and the community. Of the 18 films, five were submitted by SRP grantees and showcased SRP research and engagement activities. Links to the SRP films are listed below. Visit the [EHS FEST Film Festival page](#) for links to the other selections.

- [Arsenic in Well Water: Treatment Options](#), *Stuart Braman, Columbia University* (6:08 minutes)
- [Mercury: From Source to Seafood](#), *Laurie Rardin, Dartmouth College* (11:57 minutes)
- [REACH Ambler - Manufacturing Ambler](#), *Frances Barg, University of Pennsylvania* (7:36 minutes)
- [University of Kentucky Superfund Research Center](#), *Bernhard Hennig, University of Kentucky* (15:00 minutes)
- [Zebrafish Biosensor](#), *Robert Tanguay, Oregon State University* (3:29 minutes)

EHS FEST Sensors and Technology Fair

The EHS FEST Sensors and Technologies Fair was an opportunity for more than 30 sensor and technology developers, funded by NIEHS and other agencies, to showcase their cutting-edge technologies and meet with leading scientists and end users in exposure science, environmental epidemiology, community research, and citizen science. SRP grantees have contributed to the following technologies highlighted at the fair. Visit the [EHS FEST Sensor Fair Abstracts](#) for a full list and description of each highlighted technology.

- National Priorities List Superfund Footprint Mapper: Site, Population, and Environmental Characteristics, *Sandra Baptista, Columbia University SRP Center*
- DERBI: A Digital Tool for Reporting Personal Exposure Results to Participants, *Julia Brody, Silent Spring Institute, Northeastern University SRP Center collaborator*
- RemRX, *Alexis Carpenter, AxNano, SRP-funded small business*
- PROTECT's Electrochemical Reactor for Remediation of Contaminated Groundwater, *Ljiljana Rajic, Northeastern University SRP Center*
- Non-Selective Passive Sampling Technology, *Kelly O'Neal, North Carolina State University, University of North Carolina SRP Center collaborator*
- Plasmonic Mercury Sensor, *Jay James, Picoyune, SRP-funded small business*
- Participatory Online Communication and Engagement Tools for Environmental Health Science Data, *Ilya Zaslavsky, University of California, San Diego SRP Center*
- Field Deployable Vapor Intrusion Monitor, *Bikas Vaidya, Lynntech, SRP-funded small business*
- AROMA TCE Analyzer, *Bruce Richman, Entanglement Technologies, SRP-funded small business*
- Wristband Chemical Sampler, *Kim Anderson, Oregon State University SRP Center*



Jay James, right, describes his mercury sensor at the Sensors and Technology Fair. (Photo courtesy of Heather Henry)



Vaidya, right, with SRP Program Administrator Heather Henry, left. (Photo courtesy of Heather Henry)

Poster Sessions

As part of two EHS FEST poster sessions,

approximately 50 SRP postdoctoral researchers, principal investigators, and research translation and community engagement teams presented groundbreaking SRP-funded research. Visit the [EHS FEST Poster Abstracts](#) for a full list and abstract for each poster.

A separate graduate student poster session was one of the highlights of SRP Monday. The poster session and competition showcased innovative research performed by SRP graduate students. Congratulations to the six students who received awards in the annual poster competition.



SRP graduate students explained their work to fellow SRP grantees and partners at SRP Monday. (Photo courtesy of Steve McCaw)

In the environmental sciences and engineering category, the winners were:

- 1st place: Ruben Spitz, Brown University
- 2nd place: James P. Sanders, University of Maryland, Baltimore County
- 3rd place: Elisabeth Feld-Cook, Louisiana State University

In the health sciences category, the winners were:

- 1st place: Elana Elkin, University of Michigan
- 2nd place: Stephanie Kim, Boston University
- 3rd place: Hao Wang, University of Washington

Congratulations to the 2016 poster winners! And thanks to all trainees who presented during the poster session and who gave an oral presentation during the meeting. It was great to hear about all of the wonderful research in the program.

PRODUCTIVE EXCHANGES AMONG GRANTEES

A Time for Discussion and Collaboration

The broad range of environmental health research, community engagement, and training funded by the NIEHS Division of Extramural Research and Training (DERT) was reflected in the program, including a wealth of cross-disciplinary activities. Throughout the week, speakers were enthusiastic about the energy and scientific exchange fostered by the gathering. In addition to NIEHS-funded grantees and partners, representatives from federal agencies, including the Environmental Protection Agency, the Centers for Disease Control and Prevention, and the Agency for Toxic Substances Disease Registry, also participated.



SRP Program Administrator Michelle Heacock, right, found a spot to talk in the crowded hallways of the Durham Convention Center. (Photo courtesy of Steve McCaw)

Other breakout meetings and Landmark Program Grantee meetings were also held throughout the week. A satellite meeting for SRP Center Administrators on Monday enabled them to get to know one another and NIEHS staff and to learn about new NIEHS guidelines.



SRP Center Administrators at EHS FEST. (Photo courtesy of Steve McCaw)