



December 2019 Newsletter

Year In Review



In a largely barren field of successes on environmental health at the federal level (notwithstanding limited progress in the courts), 2019 was a year of accomplishments here at EHSC. Below we review a few highlights of the past year.

Irva Hertz-Picciotto

Director and Principal Investigator

EHSC scientists lent their expertise

to campaign against chlorpyrifos



In lieu of federal protections against the widely used agricultural pesticide chlorpyrifos, our members and community stakeholders have been at the forefront of the movement to ban this toxic chemical in California.

EHSC Director and Epidemiologist Irva Hertz-Picciotto testified in April during a California Senate Health Committee hearing on [Senate Bill 458](#), which would ban chlorpyrifos in the state. During her testimony, Hertz-Picciotto said the evidence, derived from [more than three dozen studies of children](#), overwhelmingly demonstrated a connection between prenatal exposures to chlorpyrifos and developmental disabilities, including intellectual impairments and autism. “No study has identified a level at which we can consider it safe,” Hertz-Picciotto told lawmakers.

In the lead up to the legislation, EHSC members helped in other ways. Molecular biologist [Isaac Pessah](#) served on California’s Developmental and Reproductive Toxicology Identification Committee, which in November 2017 [established chlorpyrifos as a reproductive and developmental toxicant](#).

[Years of mounting research](#) coupled with community activism drawing attention not just to acute poisonings but also to the developmental consequences for children who were exposed prenatally over the long-term, paid off in October 2019 when the state announced it would

[phase out use of chlorpyrifos](#) in California the following year. To prevent a prolonged legal battle over any legislation, the Department of Pesticide Regulation announced the cancellation of chlorpyrifos's product registrations. As a result, chemical manufacturers agreed to stop selling the pesticide in California beginning in early 2020, and the state agreed to help them and farmers come up with safer alternatives.

The National Academies of Sciences featured EHSC in its first-ever wildfire workshop



The National Academies of Sciences, Engineering and Medicine (NASEM) held its first-ever workshop on wildfires June 4-6, 2019 at the UC Davis Betty Irene Moore School of Nursing. The workshop, [Implications of the California wildfires for health, communities and preparedness](#), brought together experts from universities, community organizations and government agencies across the nation to discuss the future of the Golden State and other regions in the West threatened by wildfires. [Read the official NASEM proceedings here.](#)

Speakers from UC Davis included Irva Hertz-Picciotto, Lisa Miller, Tina Palmieri, Heather Riden and Benjamin Houlton. Hundreds attended the workshop, which was held in Sacramento and viewed via live webcast. Read more about the workshop and get links to panel videos via our recap of the event, [Burning down the House: Wildfires and California's potential to remake itself](#).

EHSC's Community Stakeholder Advisory Committee meeting drew one of its biggest crowds yet



Fall CSTAC Meeting

On October 2, the [Community Engagement Core](#) hosted our biannual [Community Stakeholder Advisory Committee \(CSTAC\)](#) meeting in Davis. The meeting, attended by over 40 researchers and CSTAC members, provided a forum for community stakeholders to pitch research ideas to UC Davis scientists and discuss the potential to develop funding proposals around the topics presented.

The workshop was a great opportunity to develop relationships between advocates and researchers, and to talk about research methods and limitations in environmental health sciences. Discussion topics included the health risks associated with increased groundwater

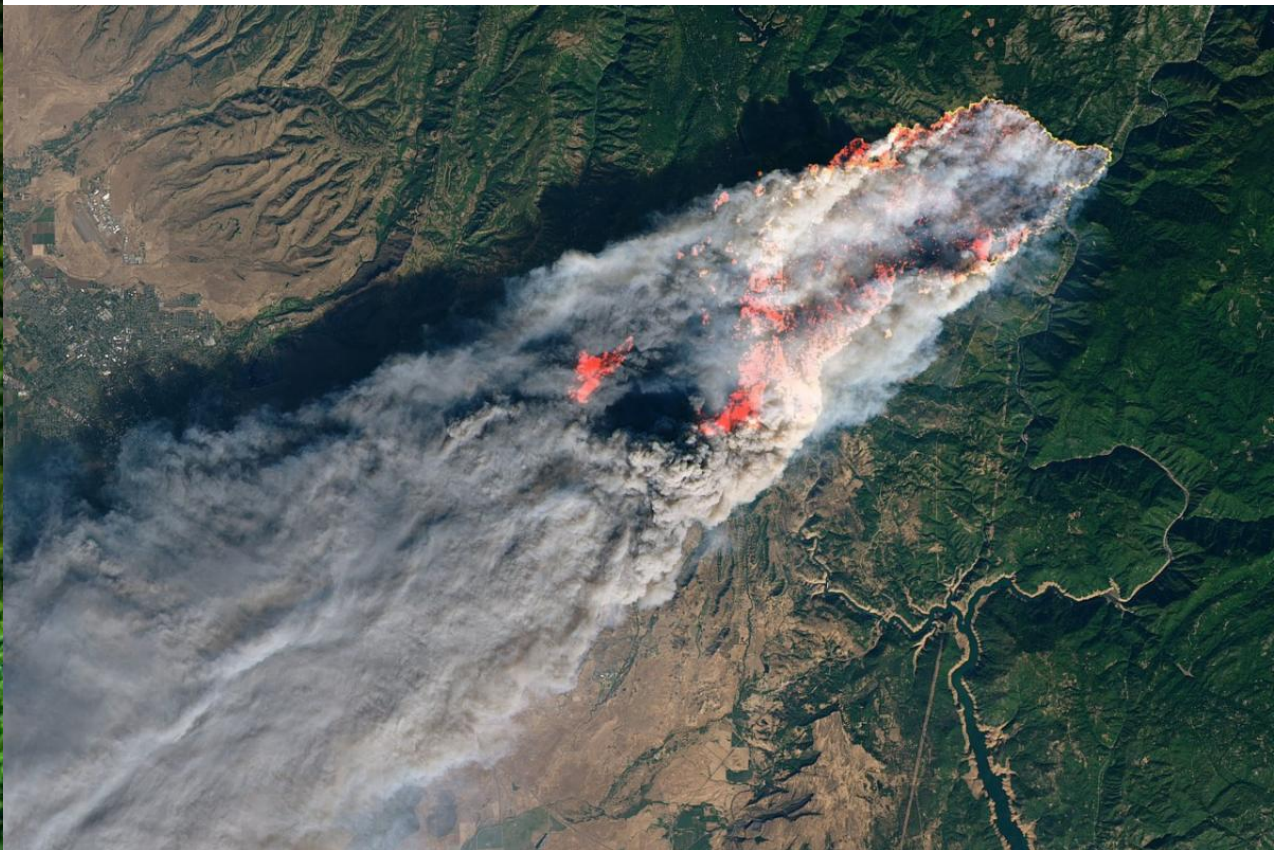
recharge, how to best measure area-wide air pollutants in the Central Valley and an ongoing exchange on measuring pesticide exposure for school-aged children.

The next CSTAC meeting will take place in February and include presentations on the most recent research findings and how they can best influence public health policy.

2020 and beyond

Currently, the CEC is supporting six EHSC-funded pilot projects to incorporate community engagement and outreach into science, and looks forward to providing support to newly funded projects in 2020. We hosted an initial meeting between EHSC and the California Air Resources Board (CARB) staff to connect our work to CARB's Community Air Monitoring program funded through [AB 617](#) and have identified initial opportunities for collaboration. The CEC will focus much of its attention in 2020 on establishing new connections between EHSC, AB 617 and our community partners who work on air monitoring. [Read more about AB617 here.](#)

PBS showcased EHSC wildfire research



Some 16,000 people watched [Waking Up to Wildfires](#) when it aired on PBS's Sacramento affiliate KVIE in October. The film covers the aftermath of the 2017 North Bay wildfires and includes interviews with Keith Bein, Irva Hertz-Piccioletto, Nicholas Kenyon and Anthony Wexler.

Beginning on December 7, the documentary will syndicate nationally for two years, so tell your family and friends to keep an eye out for it on other PBS stations across the country! You can read more about the film's genesis in this [NIEHS *Environmental Factor* article](#).

EHSC's audience flourished from fans to followers to study participants



Our website and social media channels are some of the ways we publicize environmental health work EHSC members do. But these platforms also have proven to be powerful tools in helping to conduct research, too. The [WHAT-NOW Study](#) currently has about 10,000 participants, most of whom we recruited through our posts inside wildfire Facebook groups [like this one](#).

To understand EHSC's influence online, we track how we do via certain metrics so we can strategize and grow our audience. EHSC's online audience or reach for 2019 was about 500,000 people through our collective platforms (Twitter, Facebook, YouTube, the EHSC website and Instagram). Including those inside Facebook wildfire groups, our [potential reach](#) is about 3 million annually. Below are metrics that show how our audience has grown year-over-year:

- Twitter [impressions](#): 246,712 in 2019, up from 38,568 in 2018
- Facebook reach: 179,532 in 2019, up from 11,972 in 2018
- YouTube impressions and views: 22,500 impressions and 10,400 views in 2019, up from 618 and 986 in 2018
- EHSC website visits: 18,600 in 2019, up from 13,144 in 2018
- Instagram reach: 691 in 2019, up from zero in 2018

What's important is that our audience is clearly growing. We hope this will spread a better understanding of environmental factors to help build a movement that can clean up our environment and turn policies toward a healthier and more sustainable future.

Research spotlight



Just published

Professor [Cristina Davis](#), Chair of the Mechanical and Aerospace Engineering Department, and Professor [Nicholas Kenyon](#), MD, Division Chief of Pulmonary, Critical Care and Sleep Medicine, published new work together in the *Journal of Breath Research*. Their study measured inflammatory molecules in the exhaled breath of teenagers using metabolomics, which can track individual metabolite changes easily over time. "It's convenient to do this at home over a few weeks. Subjects can store their breath samples in the freezer, then we collect all the samples when they're done, so it's easy to get longitudinal data," says Davis.

Schmidt AJ, Borrás E, Nguyen A, Yeap D, Kenyon NJ, Davis CE. Portable exhaled breath condensate metabolomics for daily monitoring of adolescent asthma. *Journal of Breath Research* (accepted, in press) DOI: 10.1088/1752-7163/ab35b5. [Read Davis's and Kenyon's research here.](#)

[Michele La Merrill](#), associate professor in the Department of Environmental Toxicology, has a new study out looking at high levels of dichlorodiphenyltrichloroethane (DDT) in Indian immigrants to the US who are at risk for diabetes. Published in the American Chemical Society's (ACS) journal *Environmental Science & Technology*, La Merrill says, "Although DDT remains in use in other nations and migration globalizes these exposures, people in the US often mistakenly regard DDT exposure as no longer relevant to our society due to its ban in this country nearly 50 years ago."

La Merrill MA, Johnson CL, Smith MT, Kandula NR, Macherone A, Pennell KD, Kanaya AM. Exposure to Persistent Organic Pollutants (POPs) and Their Relationship to Hepatic Fat and Insulin Insensitivity among Asian Indian Immigrants in the United States. *Environmental Science & Technology*. 2019, 53, 23, 13906-13918. [Read La Merrill's research here.](#)

[Laura Van Winkle](#), professor in the Department of Anatomy, Physiology and Cell Biology in the School of Veterinary Medicine, published research in *ACS Nano*, the first-ever

experiment to show a higher percentage of nanoparticles passing from the lungs to blood in immature rats than in adult rats. Nanoparticles are less than 100 nanometers (or billionths of a meter) and the same size as ultrafine particulate matter. Scientists used nanoparticles of gold to control particle size and be able to track and image them. The collaboration with Harvard's EHSC builds on epidemiological work showing children are more susceptible to particulate matter. "The images supplied from my lab at UC Davis used nifty, new state-of-the-art equipment we got on an NIH S10 – a CytoViva Hyperspectral imaging system," says Van Winkle. "That's part of the imaging core here at UC, also available to Center investigators to image unstained nanoscale objects."

Tsuda A, Donaghey TC, Konduru NV, Pyrgiotakis G, Van Winkle LS, Zhang Z, Edwards P, Bustamante JM, Brain JD, Demokritou P. Age-Dependent Translocation of Gold Nanoparticles across the Air–Blood Barrier. *ACS Nano*. 2019 Sep 24;13(9):10095-10102. [Read Van Winkle's research here.](#)

Pilot projects

Buchholz BA, Carratt SA, Kuhn EA, Collette NM, Ding X, **Van Winkle LS**. Naphthalene DNA Adduct Formation and Tolerance in the Lung. *Nucl Instrum Methods Phys Res B*. 2019 Jan 1;438:119-123. doi: 10.1016/j.nimb.2018.07.004. Epub 2018ul 13.

Carratt SA, Hartog M, Buchholz BA, Kuhn EA, Collette NM, Ding X, **Van Winkle LS**. Naphthalene genotoxicity: DNA adducts in primate and mouse airway explants. *Toxicol Lett*. 2019 May 1;305:103-109. doi: 10.1016/j.toxlet.2019.01.009.

Granillo L, Sethi S, Keil KP, Lin Y, Ozonoff S, Iosif AM, **Puschner B, Schmidt RJ**. Polychlorinated biphenyls influence on autism spectrum disorder risk in the MARBLES cohort. *Environ Res*. 2019 Apr;171:177-184. doi:10.1016/j.envres.2018.12.061. Epub 2018 Dec 25.

Hung PH, **Van Winkle LS**, Williams CJ, Hunt PA, VandeVoort CA. Prenatal Bisphenol A Exposure Alters Epithelial Cell Composition in the Rhesus Macaque Fetal Oviduct. *Toxicol Sci*. 2019 Feb 1;167(2):450-457. doi: 10.1093/toxsci/kfy251.

Keil KP, Sethi S, Wilson MD, **Silverman JL**, Pessah IN, Lein PJ. Genetic mutations in Ca(2+) signaling alter dendrite morphology and social approach in juvenile mice. *Genes Brain Behav*. 2019 Jan;18(1):e12526. doi: 10.1111/gbb.12526. Epub 2018 Nov 6.

Walter KM, Miller GW, Chen X, Yaghoobi B, **Puschner B**, Lein PJ. Effects of thyroid hormone disruption on the ontogenetic expression of thyroid hormone signaling genes in developing zebrafish (*Danio rerio*). *Gen Comp Endocrinol*. 2019 Feb 1;272:20-32. doi: 10.1016/j.ygcen.2018.11.007. Epub 2018 Nov 15.

EHSC research in the news

Below are news accounts featuring work our researchers did in 2019:

- [Poison Fruit](#) by Sharon Lerner, *The Intercept*
- [California to ban controversial pesticide, citing effects on child brain development](#) by Brady Dennis and Juliet Eilperin, *The Washington Post*
- [Raging wildfires send scientists scrambling to study health effects](#) by Sara Reardon, *Nature*
- [As wildfires devour communities, toxic threats emerge](#) by Sharon Bernstein, Reuters
- [Studies seek to uncover long-term effects of wildfire smoke on babies, pregnant mothers](#), FOX40
- [After years of improvement, air quality has gotten worse since 2016](#) by Joshua Bote, *USA Today*

If you have an announcement, new research to share with other scientists or you'd like to contribute to this monthly newsletter in some way, please contact Jennifer Biddle (jsbiddle@ucdavis.edu).

HAPPY
holidays



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