

Hurricane Harvey Wristband Study Update

August 2019



Oregon State
University

Oregon State University

- Kim A Anderson, PhD
- Diana Rohlman, PhD

Department of
Environmental and
Molecular Toxicology

College of Public Health
and Human Sciences

Superfund Research
Program at Oregon State
University



OSU FOOD SAFETY AND ENVIRONMENTAL STEWARDSHIP Developed and supplied wristbands for this study.



Baylor College of Medicine

- Melissa Bondy, PhD
- Winifred Hamilton, PhD
- Abiodun Olyuomi, PhD
- Joseph Petrosino, PhD
- Cheryl Walker, PhD



UTHealth – Health
Science Center at
Houston School of Public
Health.

- Elaine Symanski, PhD

National Institutes of
Environmental Health
Sciences

CONFLICT OF INTEREST STATEMENT

Kim Anderson and Diana Rohlman have a conflict of interest related to this study. These researchers own or are related to someone who owns a company that provides services related to the silicone wristbands and that interest could influence research that you participated in.

WHO Researchers from Oregon State University collaborated with Baylor College of Medicine and the UTHealth – Health Science Center at Houston School of Public Health.

WHAT We used wristbands to look at personal chemical exposure after Hurricane Harvey

WHY The wristbands can measure up to 1,530 different chemicals. This information can help us understand what chemicals people may be exposed to after extreme flooding.

CHEMICALS WE STUDIED We studied 9 different chemical categories. Not all of these chemicals are known to be toxic, but they are found in our environment.



We look at household and commercial **Pesticides**, like mosquito repellent.



Dioxins and Furans take a very long time to break down. They are natural and man-made.



Chemicals in hand sanitizers are types of **Pharmaceutical** chemicals. So are caffeine and nicotine.



Polycyclic Aromatic Hydrocarbons (PAHs) are a common type of air pollution produced by burning.



Industrial chemicals are found in products made out of plastic.



Flame Retardants are found in upholstered furniture, making them harder to burn.



Polychlorinated Biphenyls (PCBs) are banned in the US, but can be found in fish and toxic waste.



Personal Care Products include perfume, lotion and cosmetics.



Endocrine Disruptors mimic normal hormones. They can be found in common chemical products, water and food. Bisphenol A is one example.

Our Study

- After Harvey, we enrolled people living or working in flooded areas. Each person wore a wristband for 7 days.
- 208 people participated in this study. We received and analyzed 173 wristbands.
- There are no regulations for many of these chemicals in the air. It is difficult to know how much of a chemical is needed to cause health effects.
- We found chemicals in the wristbands but that does not mean they will cause health effects.

Take Home Messages

- An average of 26 chemicals were found in each wristband.
- Overall we saw 183 chemicals out of 1530
- Endocrine disrupting chemicals were the most common chemical we found.
- NO dioxins or furans were detected.
- Next Steps: Look at the impact of extreme flooding on chemical exposures
- Additional updates will be posted to our website: <http://fses.oregonstate.edu/harvey>

Thank you for your interest in this study. Please do not hesitate to reach out if you have additional questions.

HarveyStudy@bcm.edu | 713 – 594 -0093
or 713 – 798 - 1298

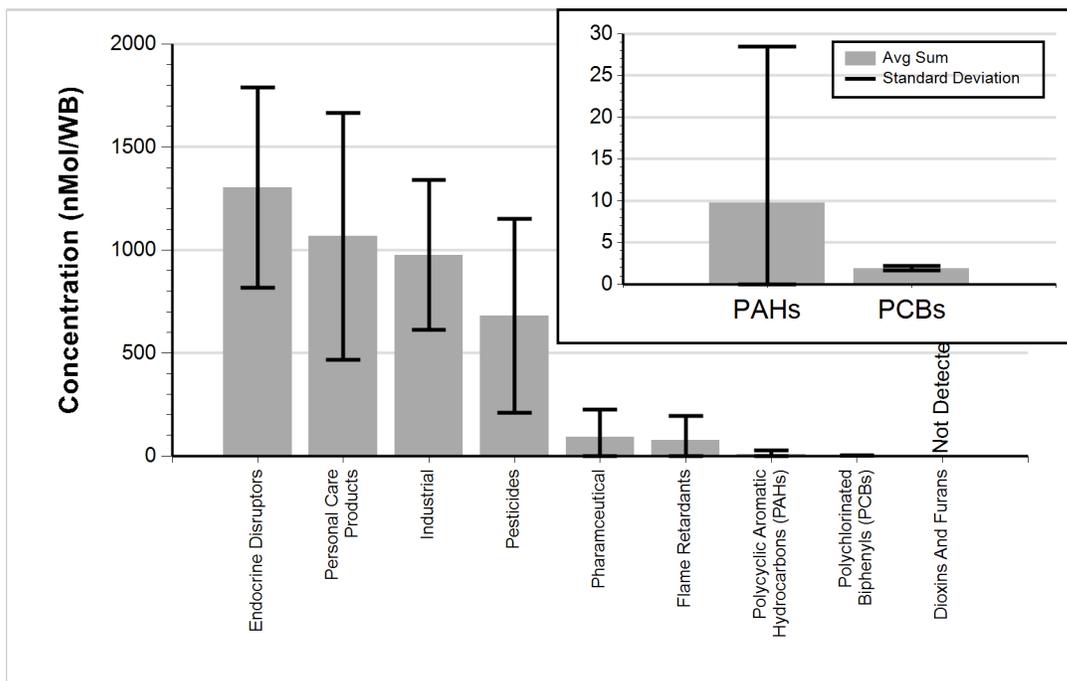
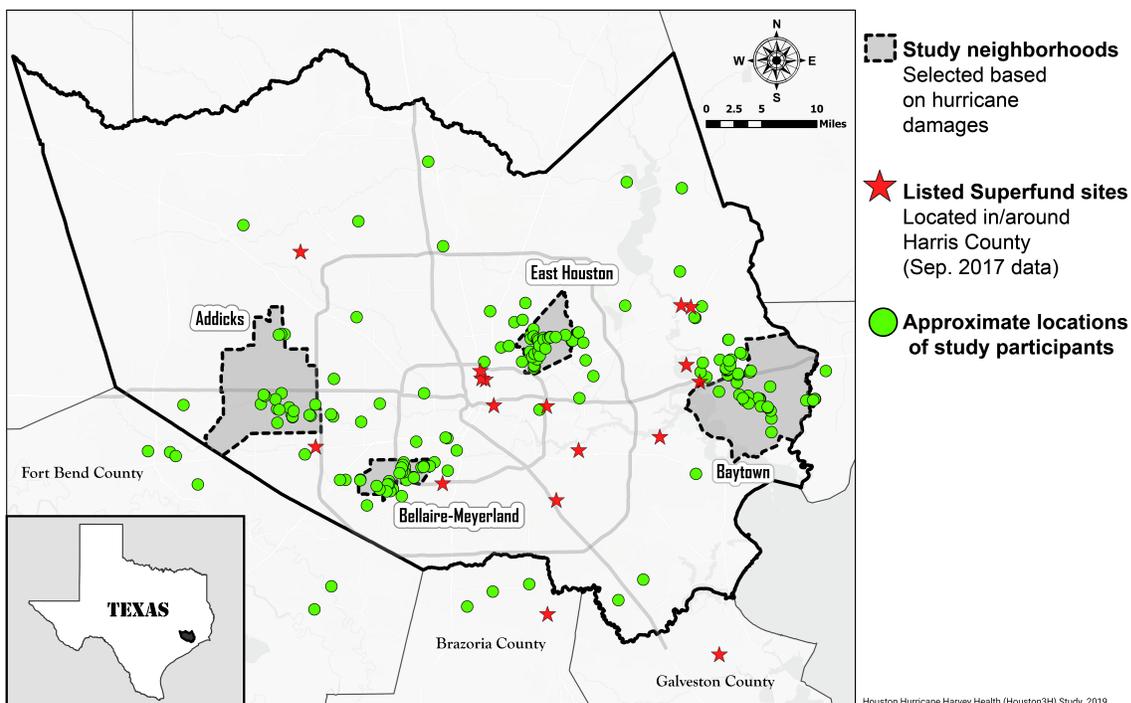
Diana Rohlman, PhD | Assistant Professor
diana.rohlman@oregonstate.edu | 541-737-4374

Kim A Anderson, PhD | Professor
kim.anderson@oregonstate.edu | 541-737-8501

Results at a Glance

Summary of the study

This map shows the different areas where we sampled (gray shaded area) and the approximate location of each person that participated (green dots). We also marked the area of known toxic waste sites (Superfund sites; red star).



We looked for **1,530** chemicals found in several different chemical categories. Some chemicals are included in more than one category. For example, hand sanitizer is a personal care product and a pesticide. For a full list of the chemicals, please visit: <http://fses.oregonstate.edu/1530>

We still do not know how much of a chemical is needed to cause a negative health effect. Our ability to measure very low levels of chemicals is helping us understand what amount of chemical might be toxic.

This graph shows the average amount of chemicals all 173 people were exposed to over 7 days (gray bars). This allows us to look at the major chemical types of pollution a community is exposed to.

For each wristband, we looked at the total amount of chemicals found in the different categories, and graphed the average amount found across all people. We zoomed in on some chemicals detected at low levels.

Standard Deviation: This describes how similar each wristband was between everyone in the study. The bigger the standard deviation (black lines), the greater the difference between people's wristbands. We expect to see these differences.

In this bar graph, you can see that people were mostly exposed to chemicals in the 'endocrine disruptor' category, followed by chemicals in the 'industrial' category.

To learn more, check out our Resources: http://fses.oregonstate.edu/1530_resources

**A nanogram is 1 billionth of a gram.