DTSC Laboratory Update

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ENVIRONMENTAL CHEMISTRY LABORATORY (ECL)

REPORT TO SCIENTIFIC GUIDANCE PANEL

Davis, CA, March 2, 2018

Outline

- Status Report
  - Personnel
  - Progress with sample analysis/method development
  - Recent findings
- Non-targeted screening
- Capabilities and capacities at risk

New Staff: Dr. Ting Jiang

- Joined on Feb 6, 2018, as an Environmental Lab Scientist funded by Centers for Disease Control and Prevention

- Ph.D. in Chemistry from Duke University, December, 2017
  - Worked on synthesis of organic dye molecules for solar energy harvesting

- Assignments will include:
  - PFASs
  - OPFRs
  - Non-targeted analysis

Lab Analyses Completed

- CA Teachers Study (CTS): August 2017
  - ✓ PFASs: n=1560
  - ✓ PBDEs: n=1656
  - ✓ PCBs/OCPs: n=1656
- ACE I: June 2017
  - ✓ PFASs: n=96
- ACE II: January 2018
  - ✓ PFASs: n=99

Progress with Projects (as of March 2, 2018)

	PFASs	PBDEs	OPFRS
MAMAS II	n=268	n=245	NA
	completed 0	completed 166	NA
FREES	NA	N=78	N=104
	NA	completed 45	completed 94
CARE Study	N=~500	NA	NA
	completed 0	NA	NA
N. CA Firefighters	TBD	TBD	TBD
	completed 0	completed 0	completed 0

New Methods and Quality Control

- US EPA's "Non-Targeted Analysis Collaborative Trial" (ENTACT):
  - 25 labs selected by US EPA
  - Human serum, wrist band, and house dust
  - ECL is one of 3 labs that submitted the final report

- US EPA's "External Laboratory Validation Study for PFASs in Water Samples"
  - Nationwide water method validation study
  - ECL is the only CA lab among 10 labs selected nationwide
  - 24 PFASs: alternative validation of expanded serum method

RECENT FINDINGS

Exposure to PFASs via Drinking Water

- Serum PFASs (GM) in women higher when PFASs detected in their drinking water versus not (Hurley et al 2017, ES&T Letter)
  - PFOS: 29% higher ($p<0.001$)
  - PFOA: 38% higher ($p<0.001$)

- Other PFASs found at low levels in matched serum and drinking water in N. California (n=7 pairs) (VillaRomero et al. 2017, SETAC)
  - PFBA
  - PFHxA
  - 6:2 FtS

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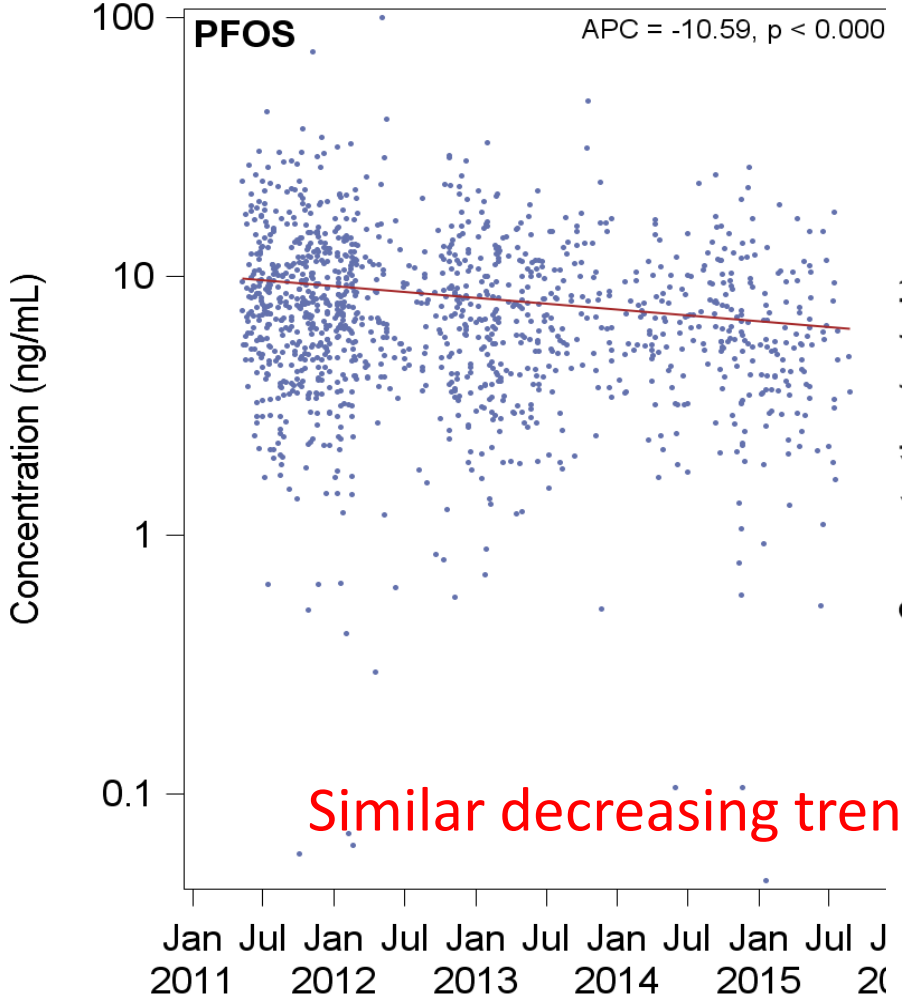
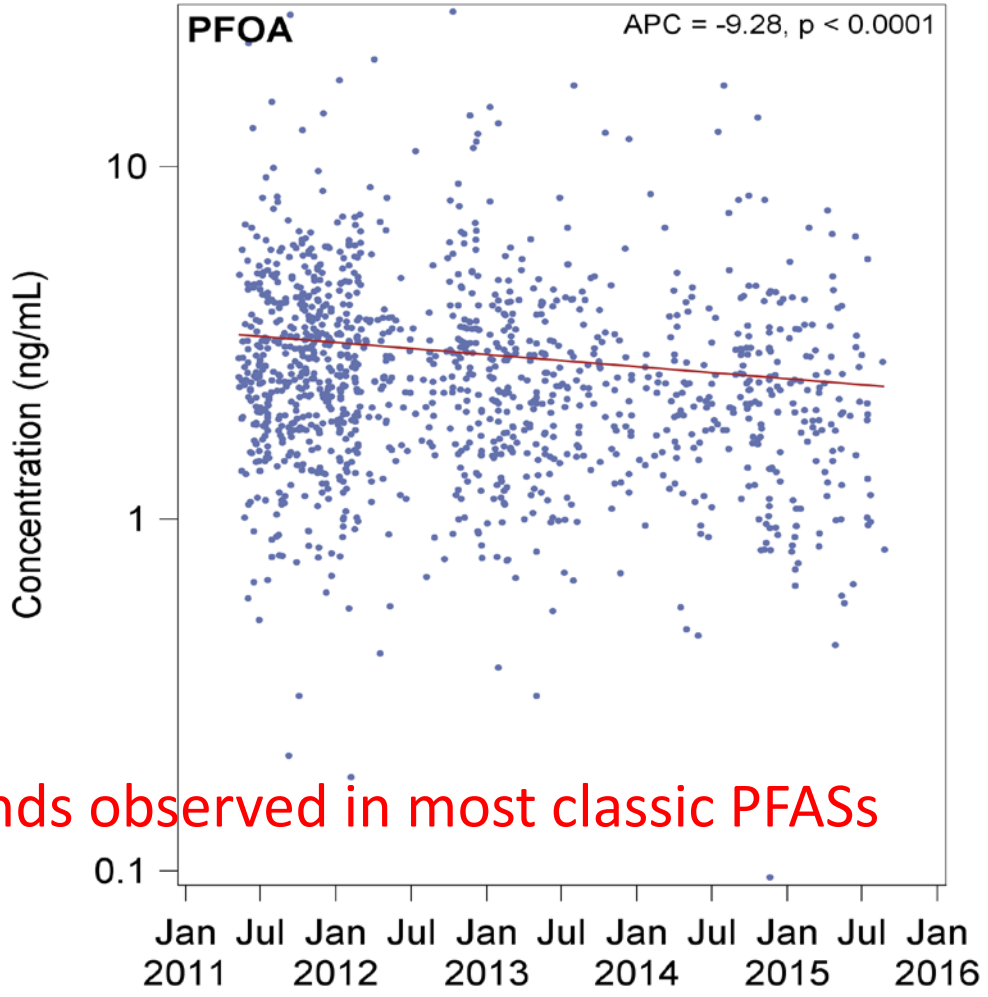
Annual Percent Change (APC)

Time Trends in Per- and Polyfluoroalkyl Substances (PFASs) in California Women: Declining Serum Levels, 2011−2015

Susan Hurley,*[,†] Debbie Goldberg,[†] Miaomiao Wang,[‡] June-Soo Park,[‡] Myrto Petreas,[‡] Leslie Bernstein,[§] Hoda Anton-Culver,[∥] David O. Nelson,[†] and Peggy Reynolds[†,⊥]



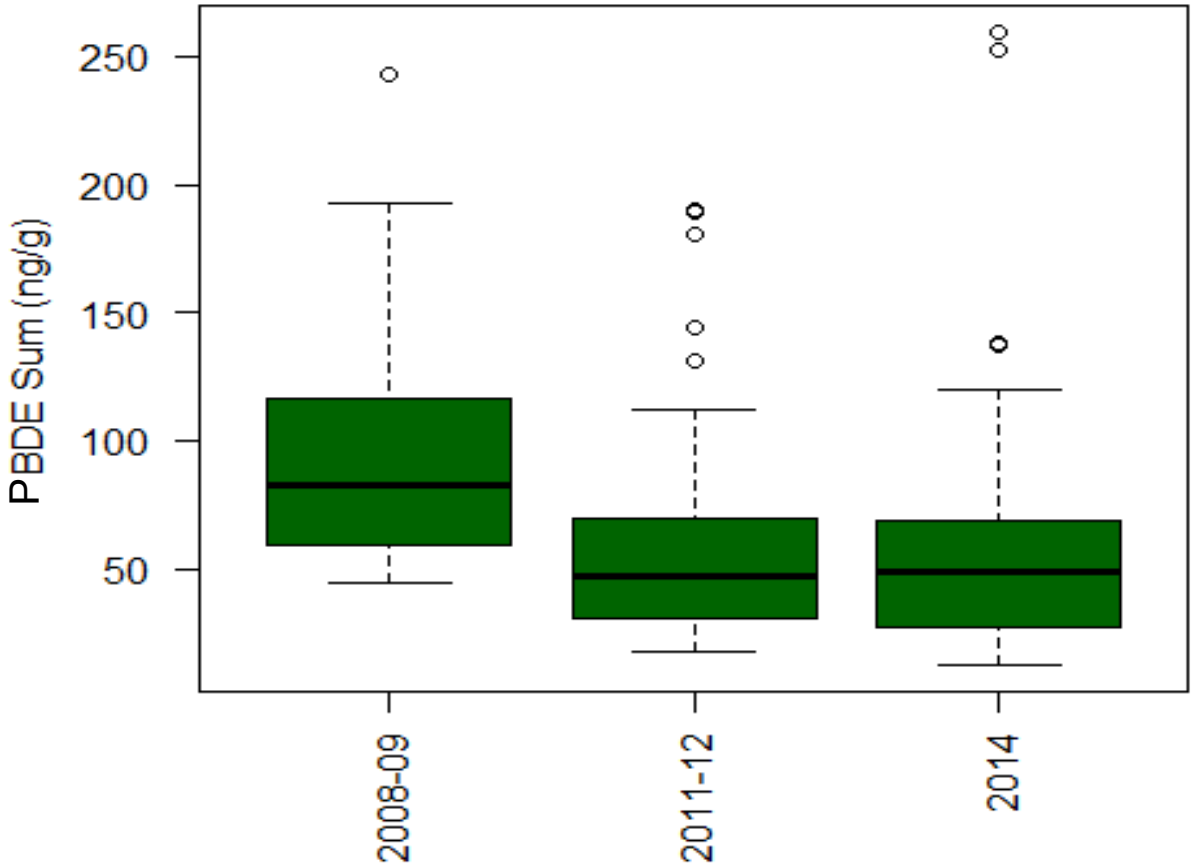


Similar decreasing trends observed in most classic PFASs

Chemosphere 195 (2018) 777–783

Polybrominated diphenyl ethers (PBDEs) and hydroxylated PBDE metabolites (OH-PBDEs): A six-year temporal trend in Northern California pregnant women

Emily Parry [a, 1], Ami R. Zota [b], June-Soo Park [a], Tracey J. Woodruff [c, *]



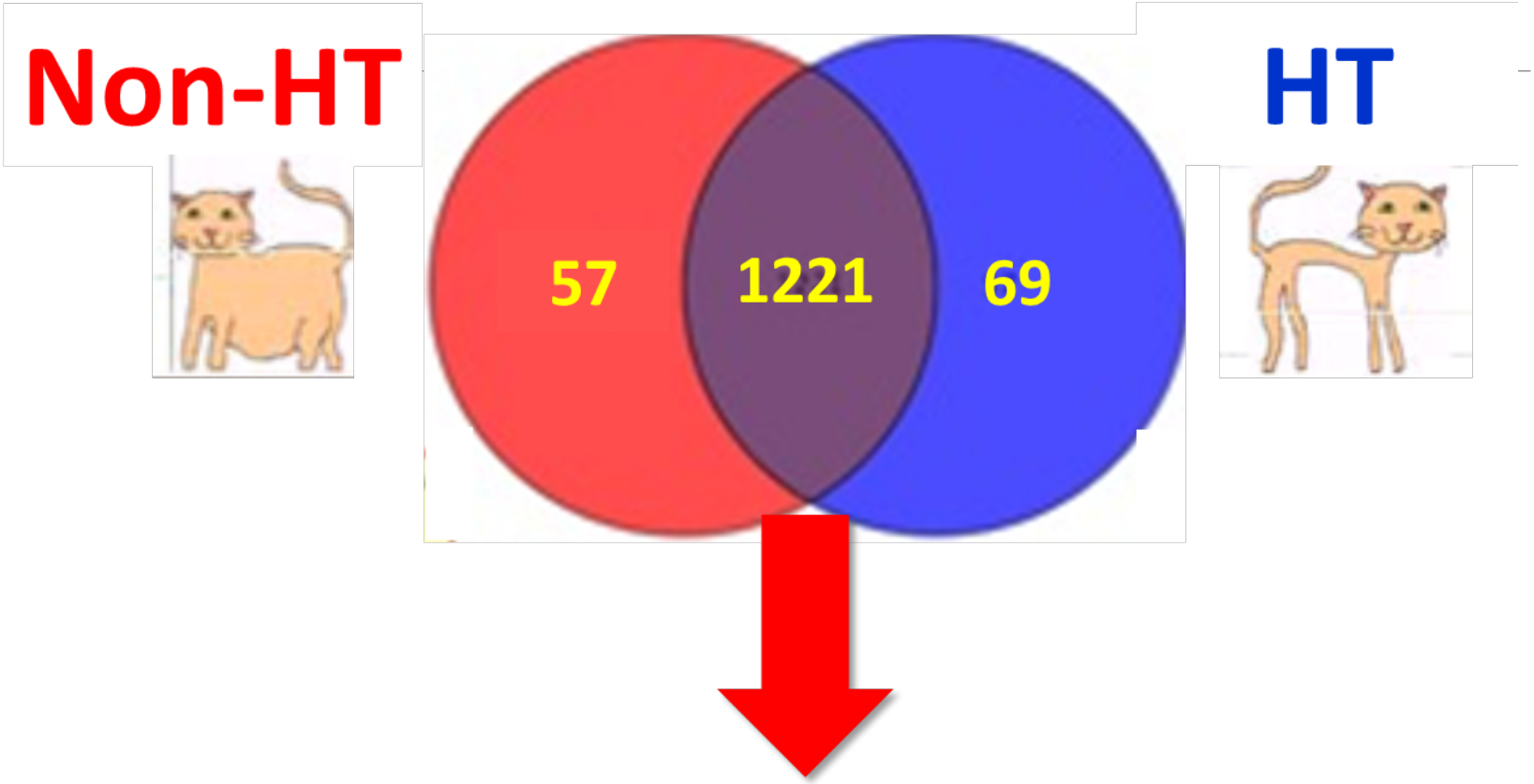
PFASs: Invited Plenary Lectures

- Association of State and Terrestrial Solid Waste Management Officials (ASTSWMO) Annual Meeting (Oct. 26-27, 2017, Washington D.C.)
- UC Berkeley Superfund Program (Jan. 30, 2018)
- Association of Public Health Laboratory Annual Meeting (June 2-5, 2018, Pasadena, CA)
- National Environmental Health Association (NEHA), the U.S. Department of Housing and Urban Development (HUD), and Office of Lead Hazard Control and Healthy Homes (OLHCHH) (June 25-28, 2018, Anaheim, CA)

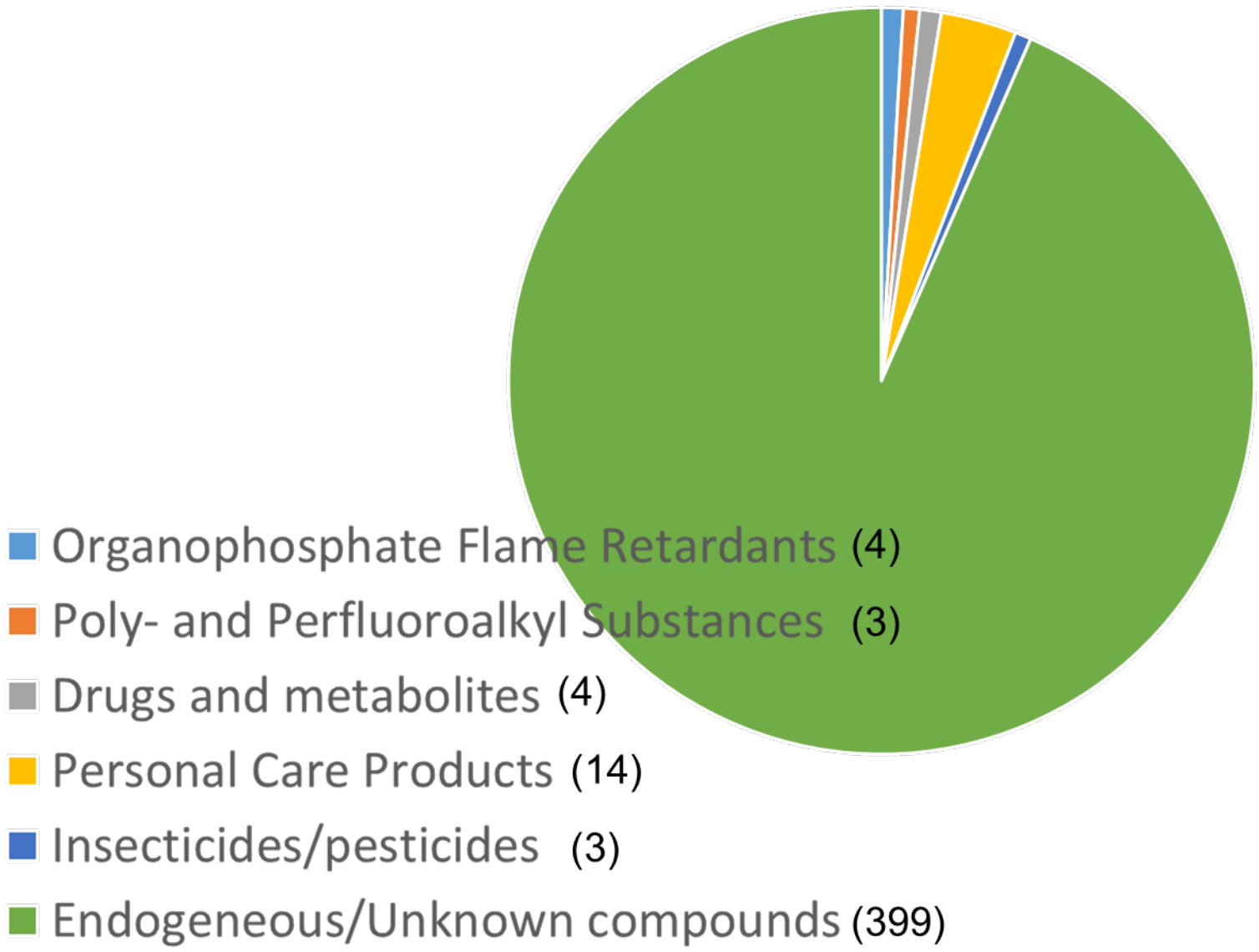
Non-targeted Screening: Update

Hyperthyroid (HT) Cats vs. non-HT Cats

Features: potential compounds, not yet identified



Identification of 427 Features Higher in HT Cats



Current NTA Activities

- Serum:
  - Matched umbilical cord and maternal serums
  - Women firefighters, office workers, and nurses
  - Firefighters during N. CA wildfires
- Storm water:
  - SF Bay ecological impact by N. CA wildfires

A Lot of Work Ahead…

Capabilities and Capacities at Risk!

Limited Term RS II and IV positions expire in June 30, 2018

- Analysis of blood and urine samples for specific chemicals or metabolites of known concern will slow considerably or stop:
  - POPs
  - OPFRs
  - PFASs
- Development of methods to analyze new chemicals of emerging concern will slow considerably or stop:
  - Non-targeted screening
- DTSC will have limited capacity to assess exposures to toxic chemicals in consumer products

Questions?