Characterizing Indoor Pesticide Use Patterns and Mass Flux in a Wastewater Catchment

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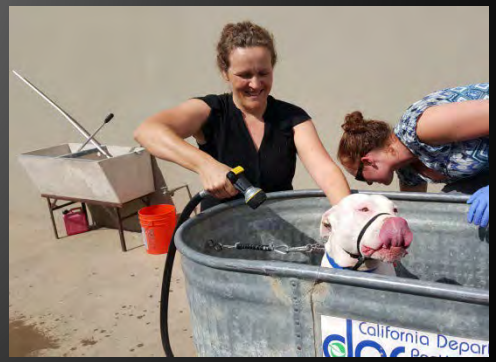
Objectives:

- Identify pesticides entering wastewater collection system.
- Quantify the relative contribution of pesticides from sewershed sources.
- Compare seasonal and weekday/weekend variation.

Residential

Institutional

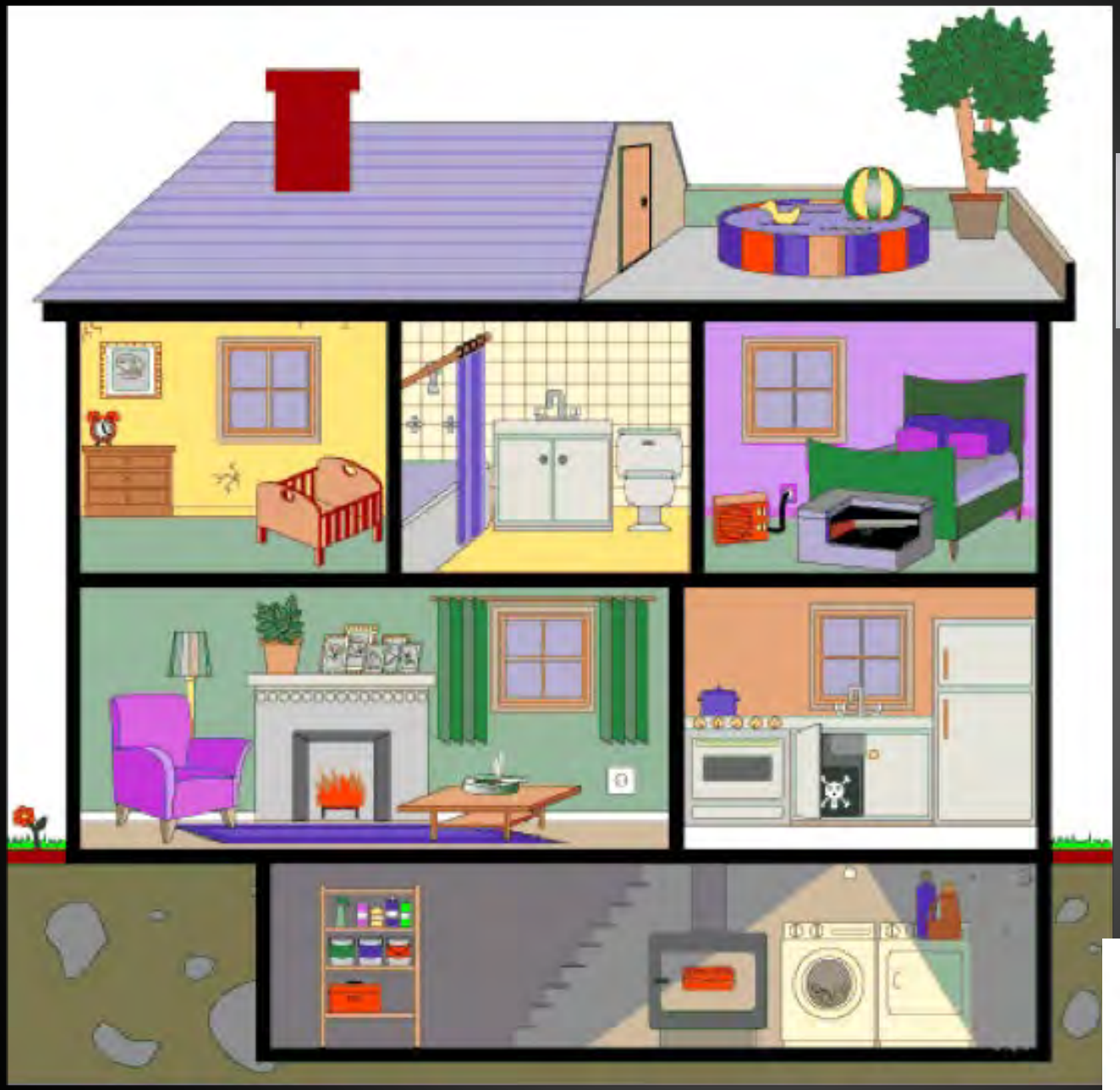


Commercial

Pyrethroid	PWG Survey[1]			Weston 2010[2]		Lowest EPA Benchmark[3] (ng/L)
	Average (ng/L)	DF	Max (ng/L)	Max (ng/L)	DF	
Bifenthrin	0.89	82	3.9	6.3	39	1.3
Cyfluthrin	0.60	60	4	1.7	6	7.4
Lambda-Cyhalothrin	0.30	48	1.6	5.5	17	2
Cypermethrin	2.11	81	13	17	6	69
Deltamethrin	0.31	16	1.2	2.7	11	4.1
Esfenvalerate	0.25	32	0.6	3.7	6	17
Fenpropathrin	0.22	3.2	0.8	0	0	64
Permethrin	20	65	170	17.2	33	1.4

	Heidler and Halden[4]			Lowest EPA Benchmark[3] (ng/L)
	Average (ng/L)	DF	Max (ng/L)	
Fipronil	30	100	70	11

San Francisco Estuary Institute conducting a survey of fipronil and fipronil degradates in California Wastewater Treatment Plant Influent and Effluent.

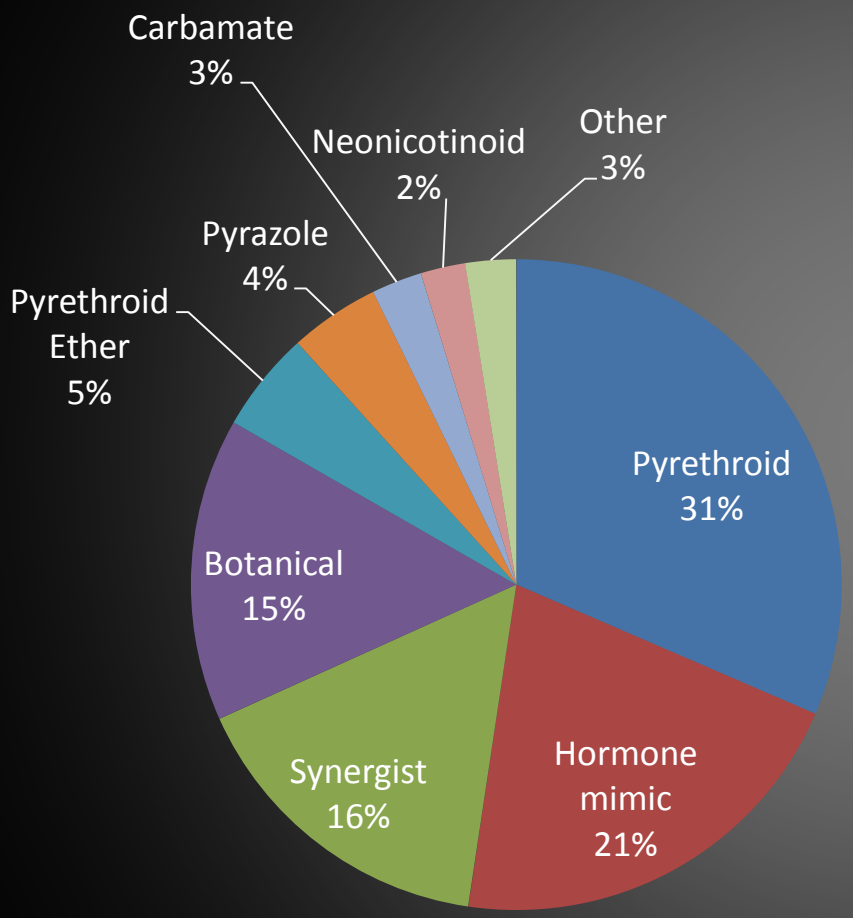


Residential

Institutional

Commercial

December 2014 Store Survey

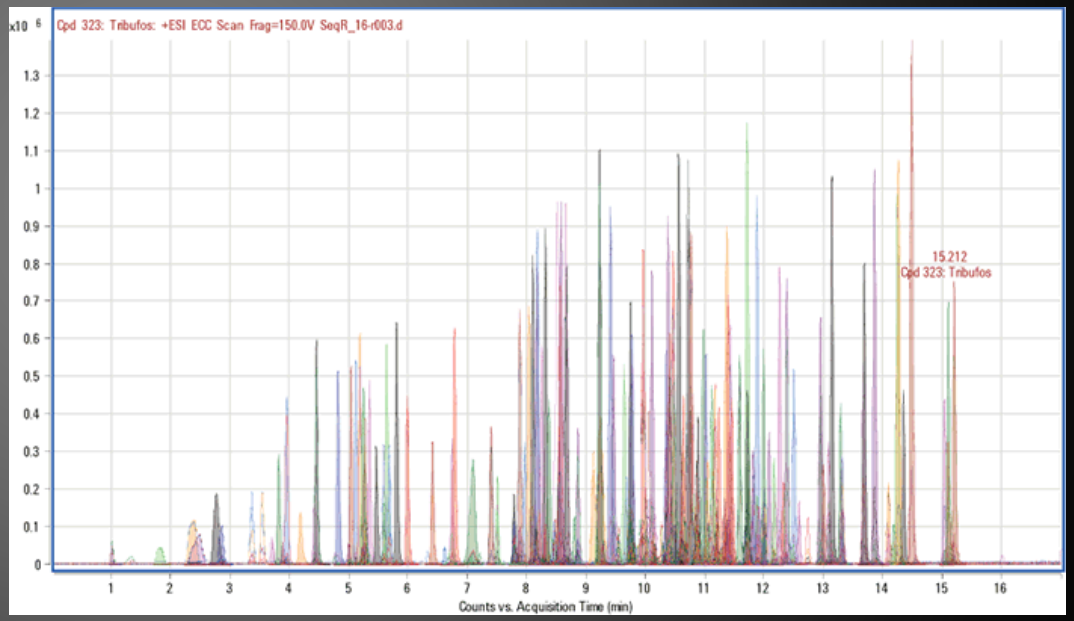


- 10 stores
- 194 products
- 62 active ingredients identified

Target and Non-Target Analysis

- Target Analysis
  - 20 pyrethroids
  - Fipronil + degradates
  - Imidacloprid
  - Chlorothalonil
  - Propoxur
  - Pyriproxyfen
  - Indoxacarb
  - Novaluron
  - Tetrachlorvinphos
  - Piperonyl Butoxide
  - (S)-Methoprene

- Non-Target Analysis



Source Identification Sampling Design

- 24- hour flow-weighted composite samples
- Paired weekday/weekend sampling events
- Seasonal variation (spring, summer, fall)
- Sampling to be scheduled spring 2016

Sampling Sites

Residential

- Age of homes
- Density of homes

Commercial

Laundry

Institutional

Hospital

Pest control operators

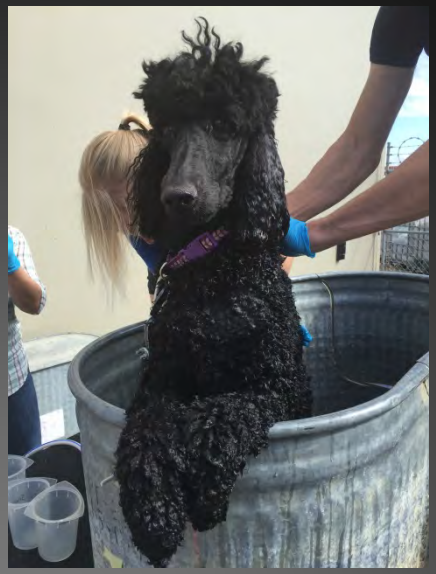
Wastewater treatment plant

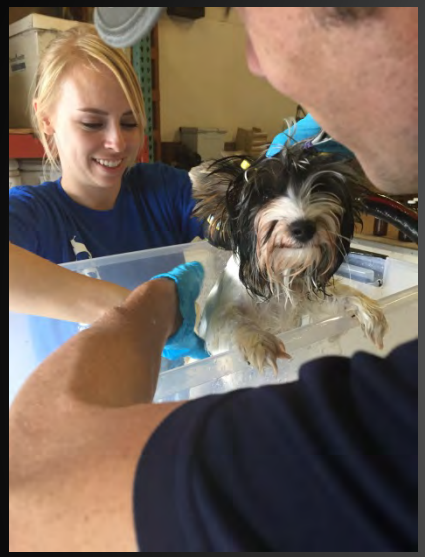
- **Influent**
- **Effluent**

Pet grooming

University

Nursery





Wash-off potential of fipronil spot-on products

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Thanks!