DPR Urban Water Monitoring

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November 9th, 2015
Objectives

1. Determine presence of pesticides in surface waters
2. Compare concentrations to threshold levels
3. Evaluate for regional differences
4. Evaluate for seasonal differences
5. Compare storm drain vs receiving water concentrations
6. Evaluate potential best management practices (BMP)
Sampling Protocol

- Sample 4 – 5 events per year
  - 2 dry season, 2 storm events (first flush)

- Prioritization model used to help determine analyte list

- Sites located at storm drains or receiving waters of urban landscapes

- Water Quality Measurements
  - pH, temp, conductivity etc.

- Flow
  - Gauging stations at 7 sites
Currently Monitored Watersheds

Northern California
(EM Study 299)

Southern California
(EM Study 270)
Pyrethroids and Fipronil (2009-2015)

Detection Frequency (%)

- Bifenthrin
- Fipronil
- Fipronil sulfone
- Desulfanyl fipronil
- Permethrin
- Cyfluthrin
- Fipronil amide
- Deltamethrin
- L-cyhalothrin

NorCal

SoCal

All other analytes <10% FD
Storm Drains vs. Receiving Waters

SD = Storm Drain
RW = Receiving Water

BM = Minimum aquatic benchmark set by USEPA

Detection frequency (%)

- % > BM

Bifenthrin
Fipronil
Fipronil sulfone
Des. fipronil
Permethrin

SD RW SD RW SD RW SD RW SD RW

Percent of Samples
Storm Drain Concentrations

BM = Minimum aquatic benchmark set by USEPA
Dry = dry season
Storm = rain events
**Observed Aquatic Toxicity**

*H. azteca* Toxicity Tests Indicate Pyrethroids at Toxic Levels in Surface Waters
Bifenthrin in Wetlands

% Reduction = Outlet concentration/Inlet concentration x 100
Observations with higher outlet concentrations set to zero
Surface Water Regulations

- Adopted July, 2012
- Professional applicators, including landscape maintenance
- Objective: reduce amount of pyrethroids applied (and therefore runoff) in urban landscapes
SW Regulations - Are They Working?

- Bifenthrin Data
- Storm Drains
- Dry Season and Storm Samples
- Parametric (MLE) and Nonparametric (Mann-Kendall) trend tests
  - All Data
  - 2010-2012 water yrs
  - 2013-2015 water yrs
Bifenthrin Trends

All tests indicate

- Slight increase in concentrations WY 2010-2012
- Slight decrease in concentrations WY 2013-2015
- Trends not significant

NEED MORE DATA!!
Mitigation and Outreach

• Homeowner Pesticide Use Surveys
• IPM project with applicators
• Meetings
  • Target Specialty Products
  • CACs
References

Sampling Plans

Study 299 – Northern California
http://www.cdpr.ca.gov/docs/emon/pubs/protocol/study299_ambient_mitigation_urban_areas.pdf

Study 270 – Southern California

Fipronil Analysis Paper