

Preventing Emerging Contaminants

Kelly D. Moran, Ph.D.
TDC Environmental, LLC

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Pesticides



Pharmaceuticals & Personal Care Products (PPCPs)



PBDEs



PFCS



Courtesy Wikipedia



Pesticide

- Consumer products
- Human made
- Deliberately used
 - Not waste, not byproducts
- Tiny environmentally relevant concentrations
- Treatment challenging



PE



Courtesy Wikipedia



Pesticides



Good candidates for Pollution Prevention

- Consumer products
- Human health
- Deliberately
 - Not waste, not products
- Tiny environmentally relevant concentrations
- Treatment challenging



PE



Courtesy Wikipedia



FIFRA (EPA)



Pharmaceuticals &
Personal Care Products (FDA)

➤ Almost all are regulated by laws intended to prevent environmental problems



PBDEs

TSCA (EPA)

PFCs



Courtesy Wikipedia



Pesticides Example: Pyrethroids

Urban Runoff Carries Pesticides to Creeks

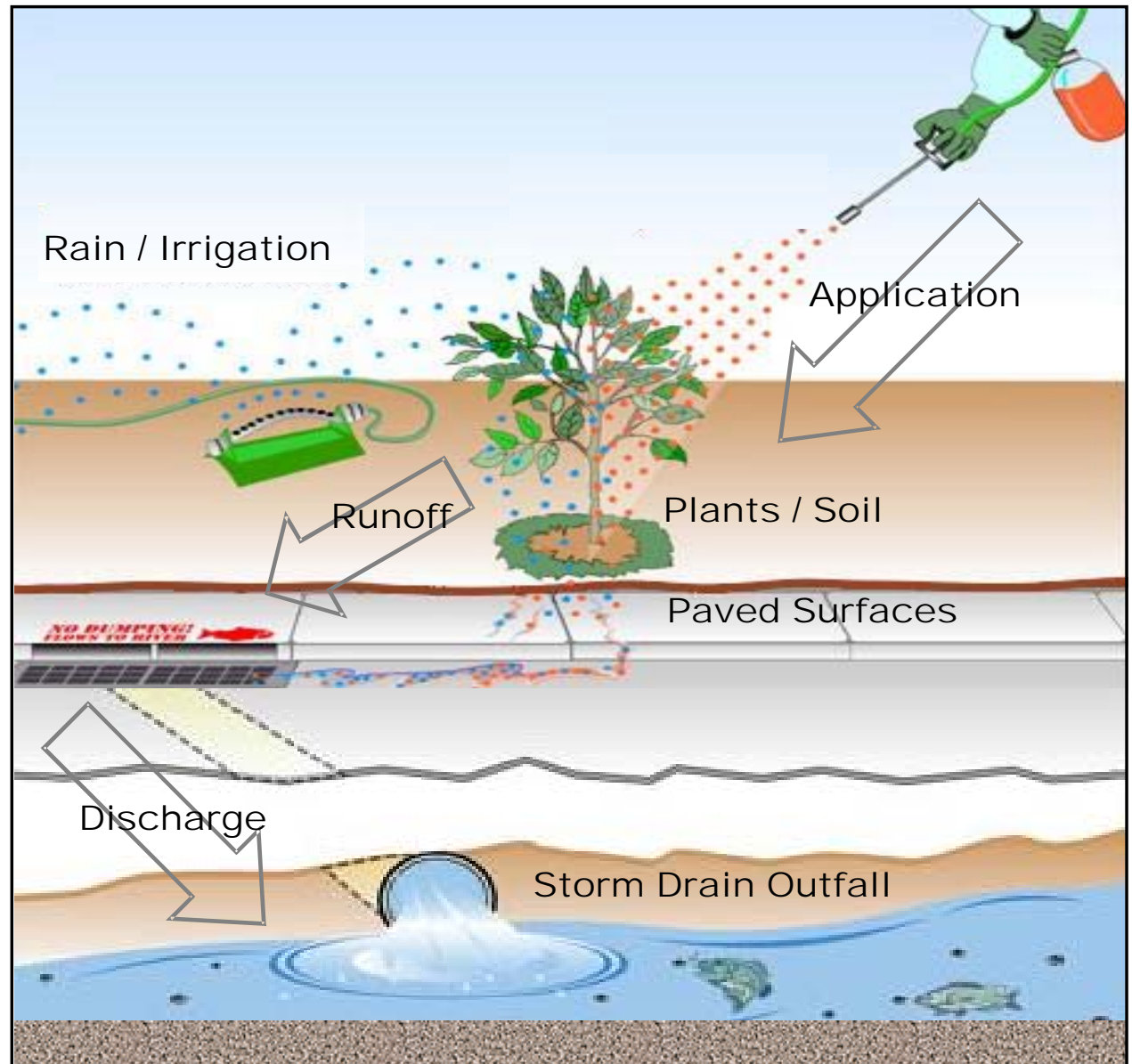
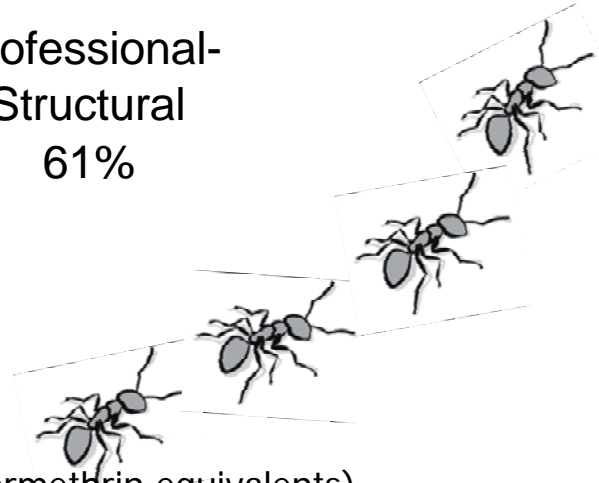
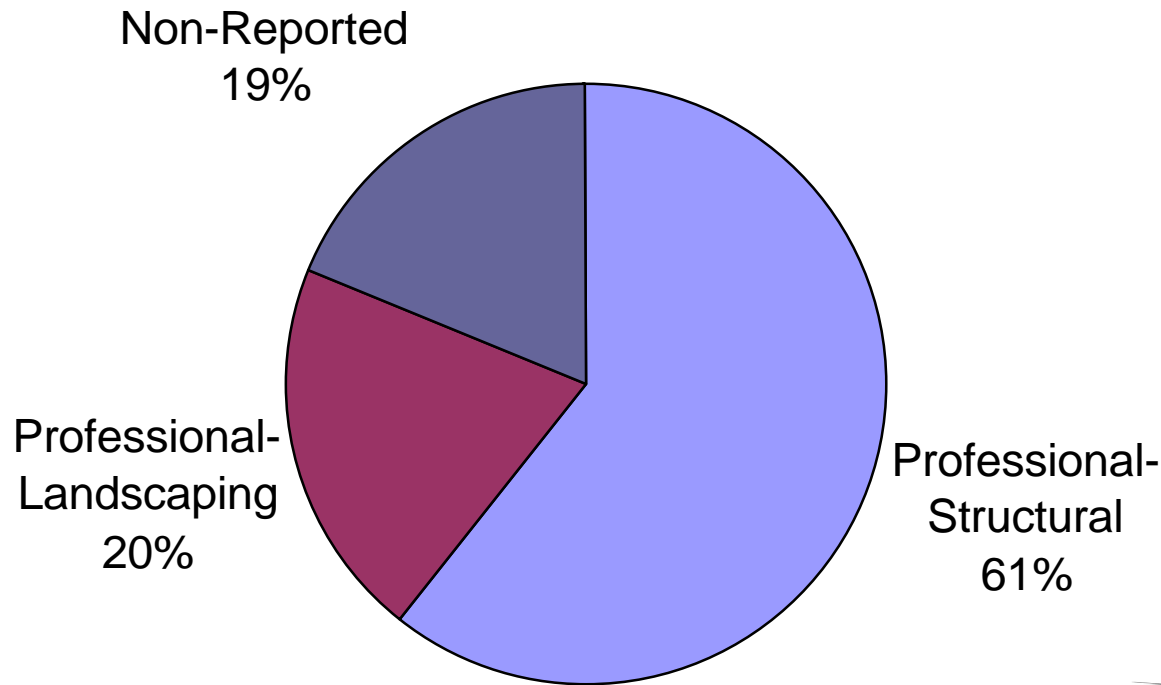


Figure courtesy SF Bay Regional Water Board, based on U.C. IPM Project drawing

All User Groups Apply Pyrethroids Outdoors in the SF Bay Area



Estimated use of study list pyrethroids in the San Francisco Bay Area, 2004 (permethrin equivalents)

Common Outdoor Urban Insecticides Are Also Common in Surface Water

1950s

Organochlorines

- DDT, Chlordane, Dieldrin, etc.

1970s

Organophosphates

- Diazinon, Chlorpyrifos, etc.

1990s

Pyrethroids

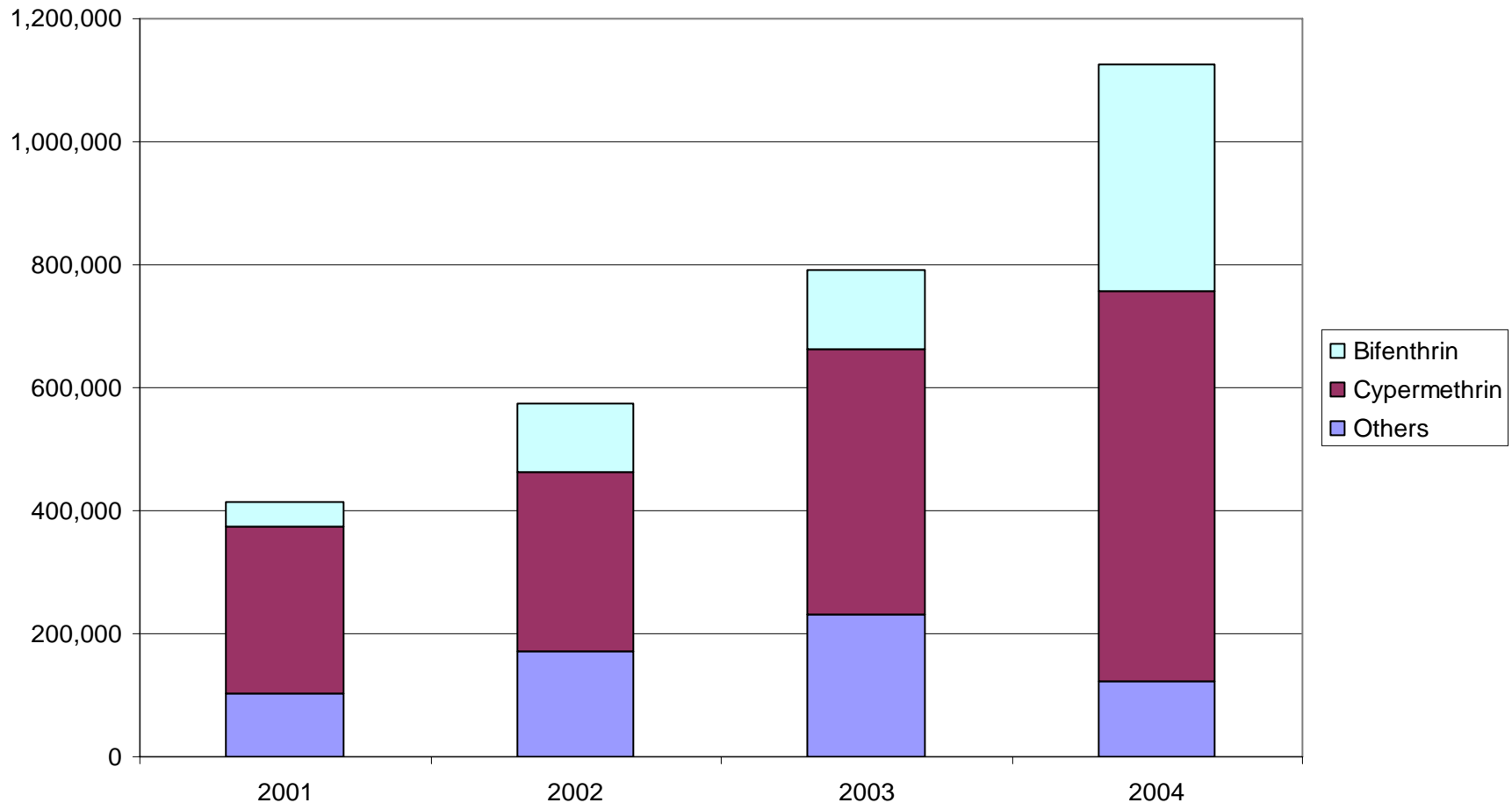
2010s

????



Toxicity of Bay Area Pyrethroids Use Almost Tripled Between 2001 & 2004

Increase coincident with diazinon phase out



Estimated use of study list pyrethroids in the San Francisco Bay Area 2001-2004 (permethrin equivalents)



Why Did It Happen?

Reason #1: The “Urban Gap”

- Pesticides are registered for uses that will cause Clean Water Act violations & municipal compliance problems
 - Urban runoff not considered
 - Sewer discharge evaluation is new
 - Water quality risks usually not mitigated



Reason #2: Little Municipal Control Over Pesticides

- Cannot regulate sales or use
- Can regulate discharge
 - But is this practical?
- Can use voluntary programs
 - Even expensive programs usually can't obtain reductions needed for

Ability to comply controlled by pesticide regulators & market—not by municipalities



Reason #3: Reactive Laws

- Pesticide laws are not structured to prevent problems
 - Proof of harm usually required before pesticide regulatory actions taken
 - No penalties for harm due to legal pesticide use

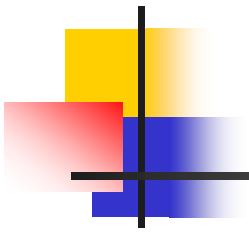
Clean Water Act is proactive—
Penalties start as soon as
problems occur



Emerging Pollutant Regulatory Gaps

- No process to prevent replacing one problem with another
- No timely mechanism to address newly identified water quality impacts
- Urban use implications often forgotten





Next Steps

Monitoring Sets Priorities

UP3 Project
Pesticides of
Concern

- Surveillance & trends
 - Need to survey literature & markets to focus on potential pollutants of concern
 - Avoid the trap of what we know how to measure
- Toxicity monitoring crucial
 - No numerical standards for most emerging pollutants
 - New endpoints need to be explored (e.g., fish feminization)



Photos courtesy USGS

Existing Regulatory Programs Can Prevent Problems

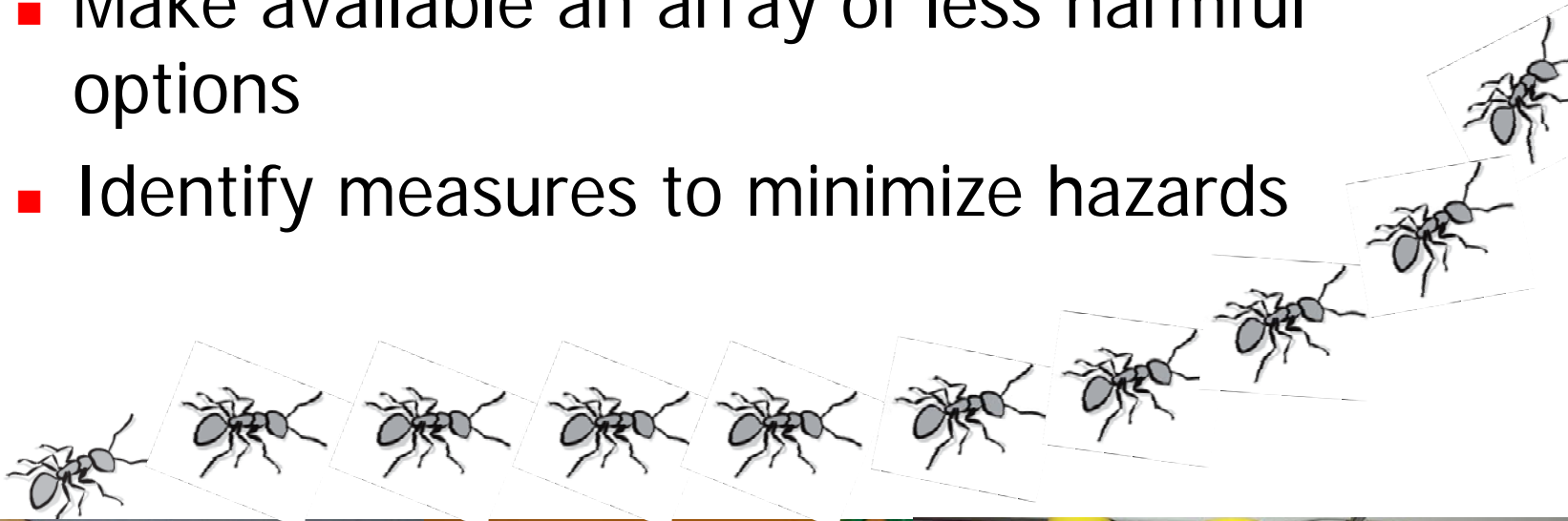
- Redesign product registration process to
 - Identify & prevent water quality problems
 - Identify & prevent NPDES permit violations
 - Effectively mitigate environmental risks
 - Consider urban settings
- Consider all of society's costs & benefits
 - Are the benefits worth the compliance costs?



Refocusing Regulation: Evaluate Purpose—Not Chemical

■ Alternatives Assessments

- Make available an array of less harmful options
- Identify measures to minimize hazards



UP3 Project

A silhouette of a city skyline with several skyscrapers of varying heights, set against a dark green background. The buildings are rendered in a lighter shade of green, creating a layered effect.

For more information on urban
pesticide use and surface water
quality:

www.up3project.org