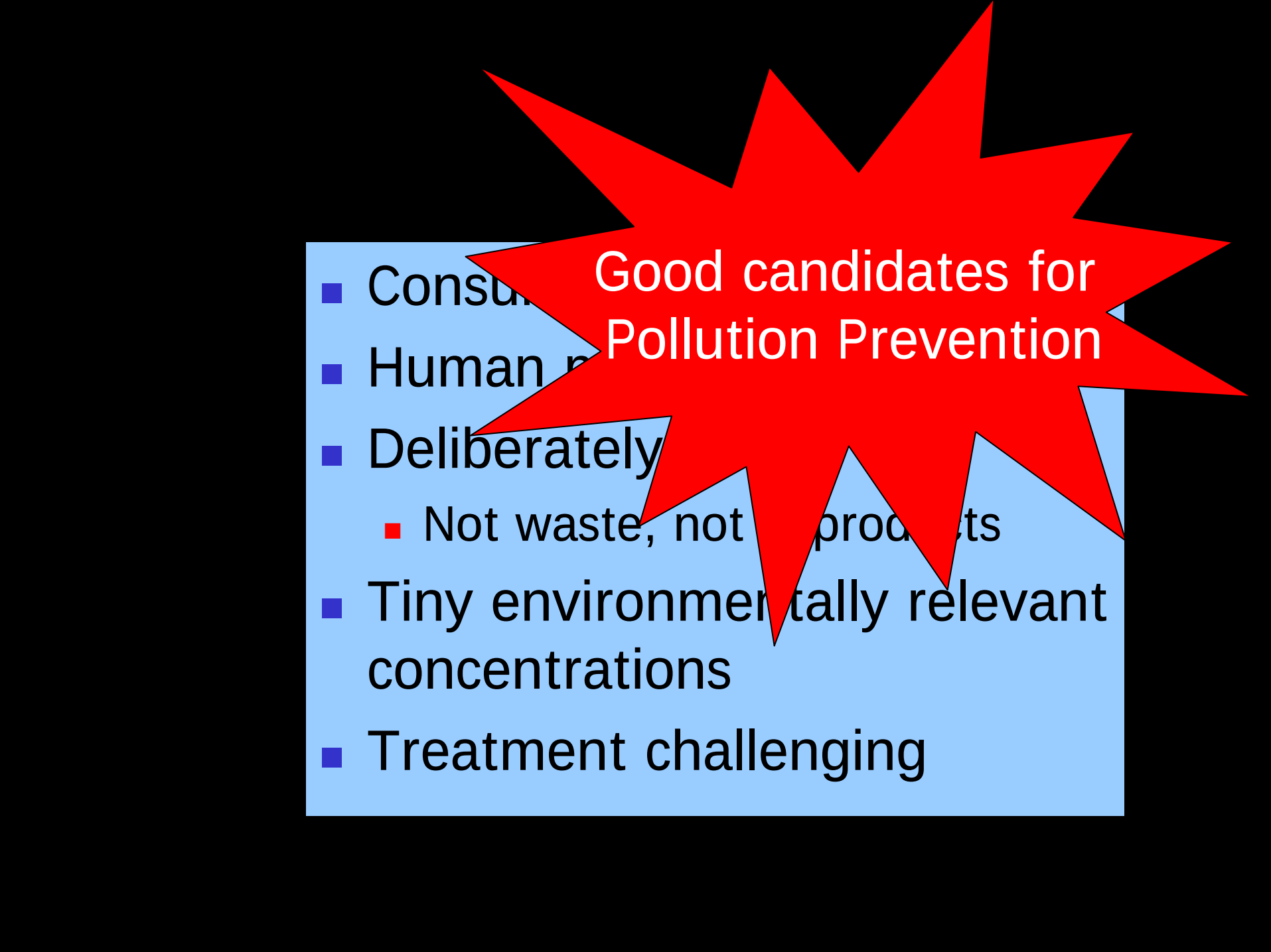
Preventing Emerging Contaminants

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

September 12, 2006

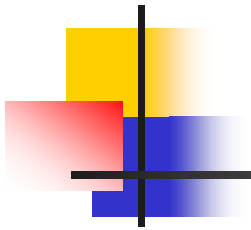

Good candidates for
Pollution Prevention
Consu
Human
Deliberately
Not waste, not
prod
ts
Tiny environmen
tally relevant
concentrations
Treatment challenging

FIFRA (EPA)

FD&C Act (FDA)

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

TSCA (EPA)



Pesticides Example: Pyrethroids

Urban Runoff Carries Pesticides to Creeks

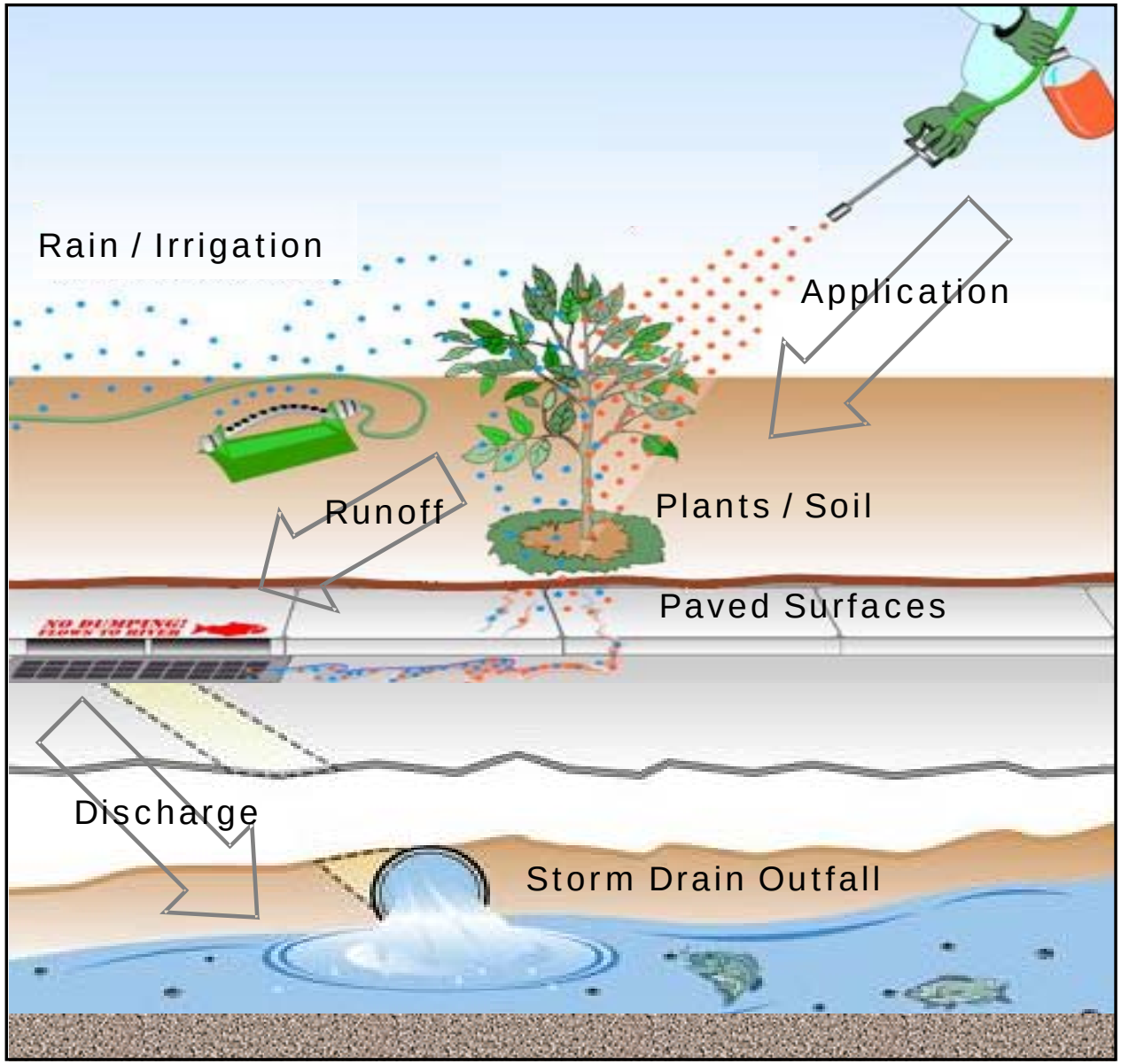
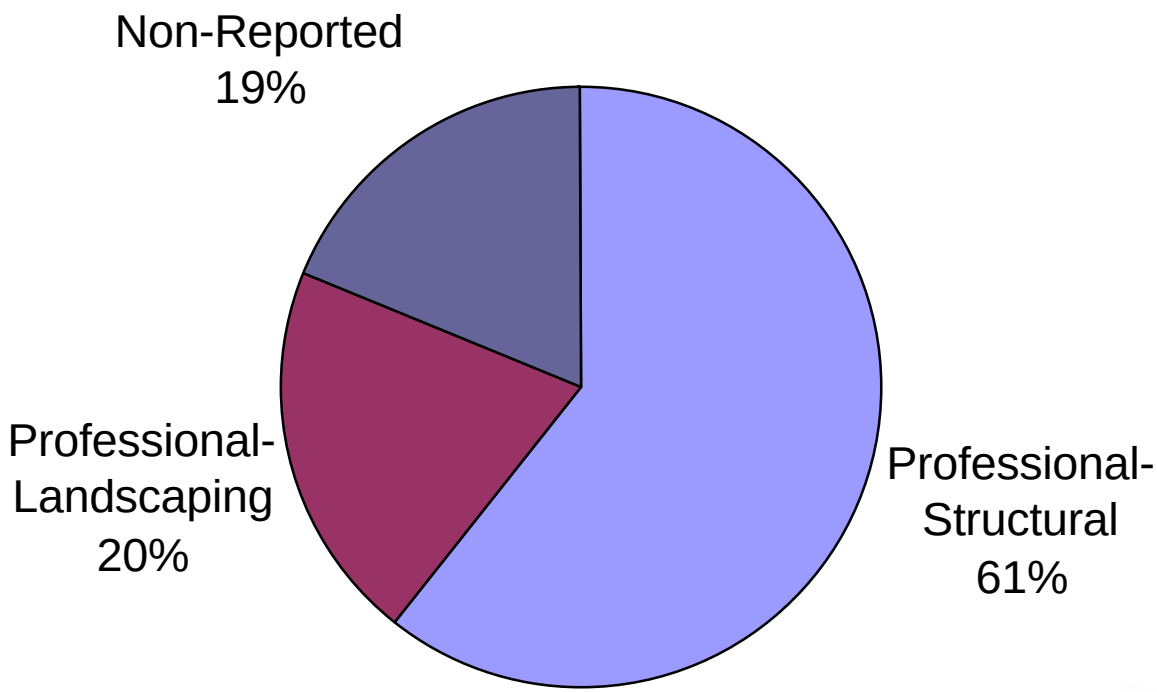


Figure courtesy SF Bay Regional Water Board, based on U.C. IPM Project drawing

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

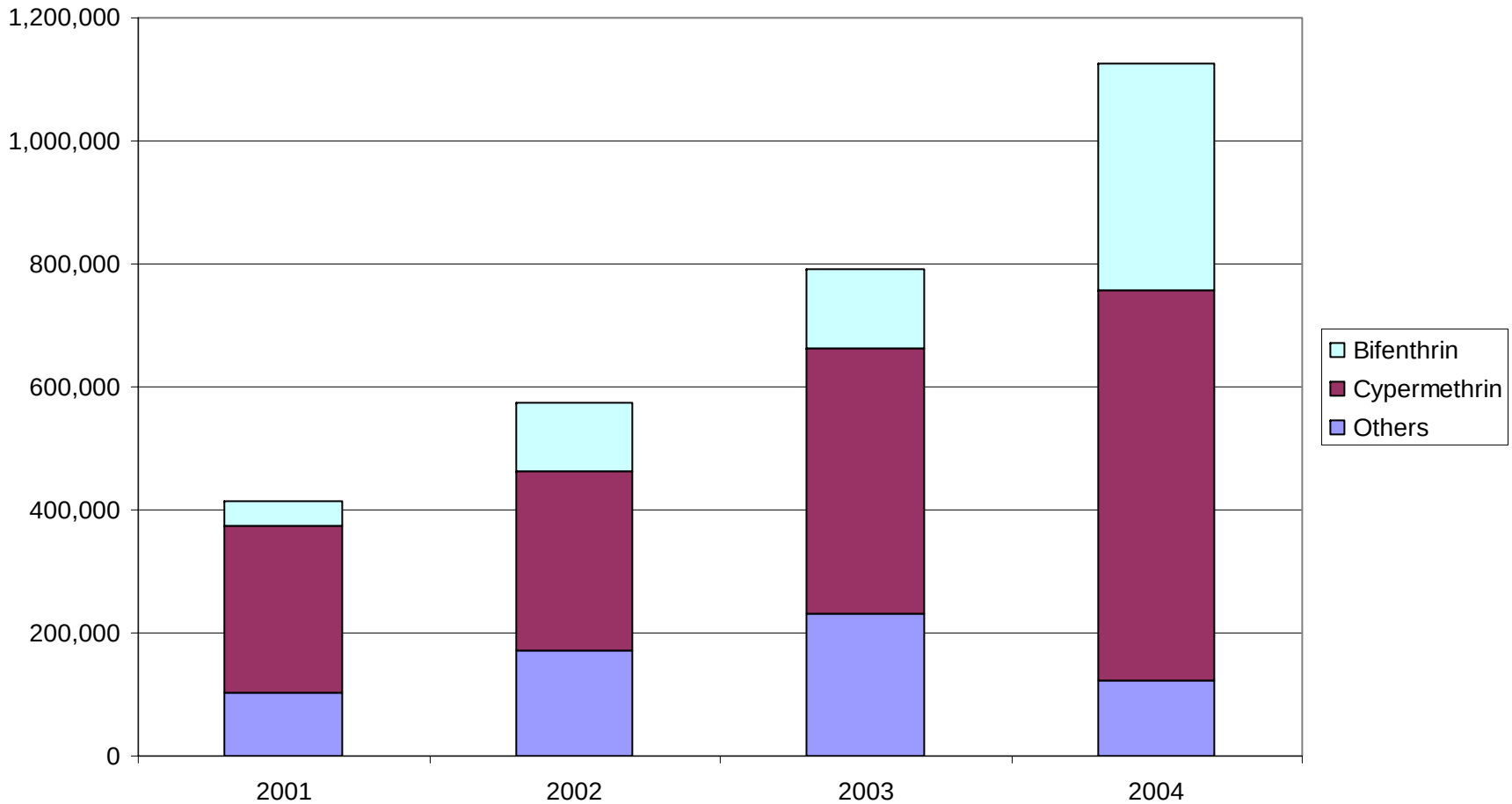
Pyrethroids

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

Photo courtesy NOAA

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

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

www.up3project.org