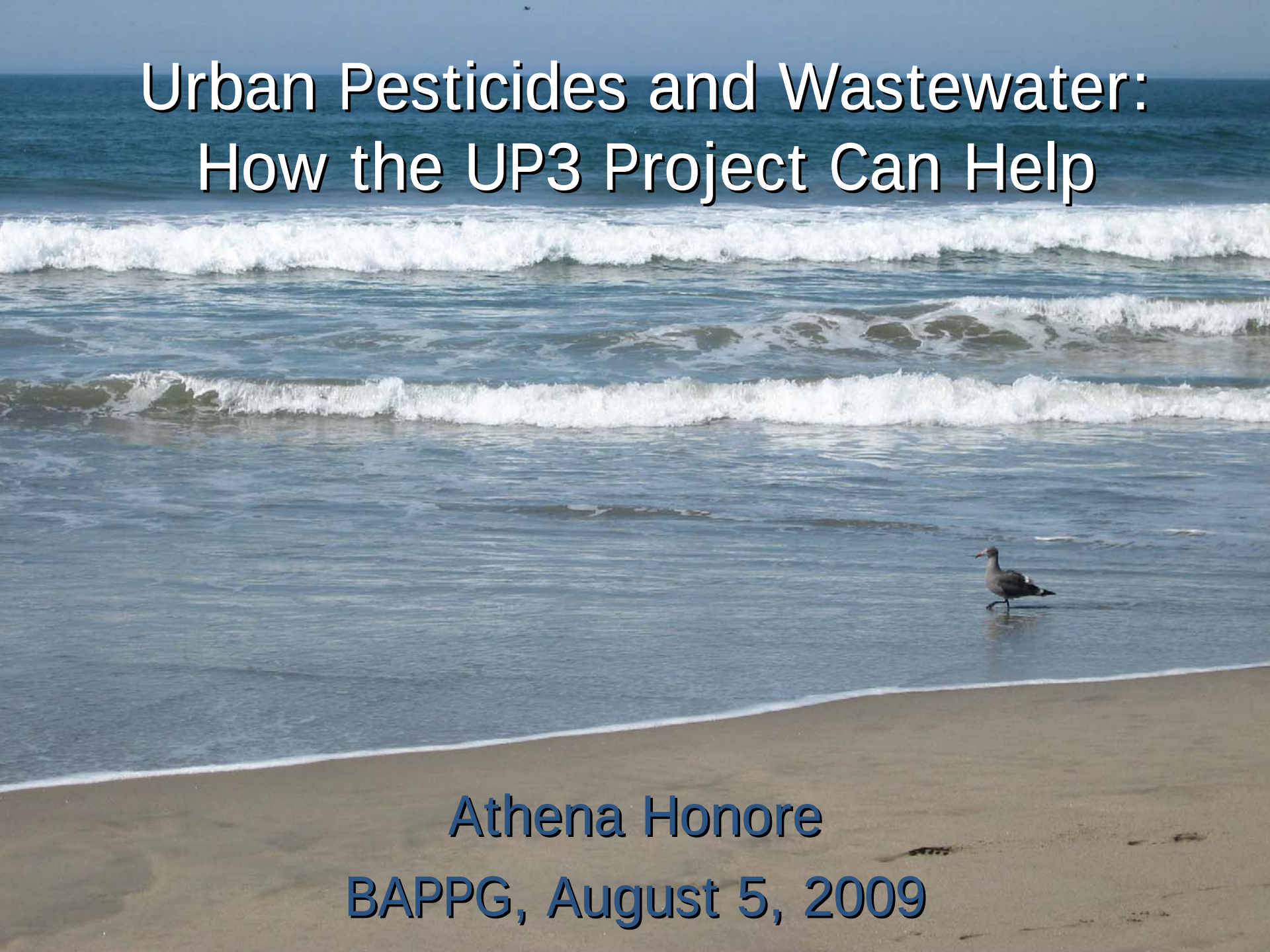
Urban Pesticides and Wastewater: How the UP3 Project Can Help



Athena Honore

BAPPG, August 5, 2009

What the Heck is UP3?

- UP3 Project: Urban Pesticide Pollution Prevention Project
- Managed by San Francisco Estuary Partnership (SFEP)
- Technical consultant Kelly Moran (TDC Environmental)
- Home agency: ABAG

UP3 Project – Mission

- To prevent water pollution from urban pesticide use
- Why urban: CA data shows more pesticides used in urban areas than ag
- Not all pesticides impacts water quality. Key is toxicity to aquatic species
- Human health, air quality – not covered

UP3 Project – History

- UPC addresses creek toxicity (diazinon) in ’95
- UP3: State Water Board grant funding
  - PRISM ’04-7; Prop 50 ’07-9
- Original mission: implement SF Urban Creeks Pesticide Toxicity TMDL
- Now statewide; wastewater and stormwater
- Stakeholders include SW, WW, state/federal regulators, pest control operators and manufacturers, IPM and NGOs

The Core Problem: Pesticide/Water Quality "Regulatory Gap"

- Clean Water Act implementation and pesticide registration (FIFRA) not coordinated
  - Pesticides registered for uses that will cause Clean Water Act violations & municipal/POTW compliance problems
- State law pre-empts most local controls

POTWs have financial responsibility for pesticides—but little control over them

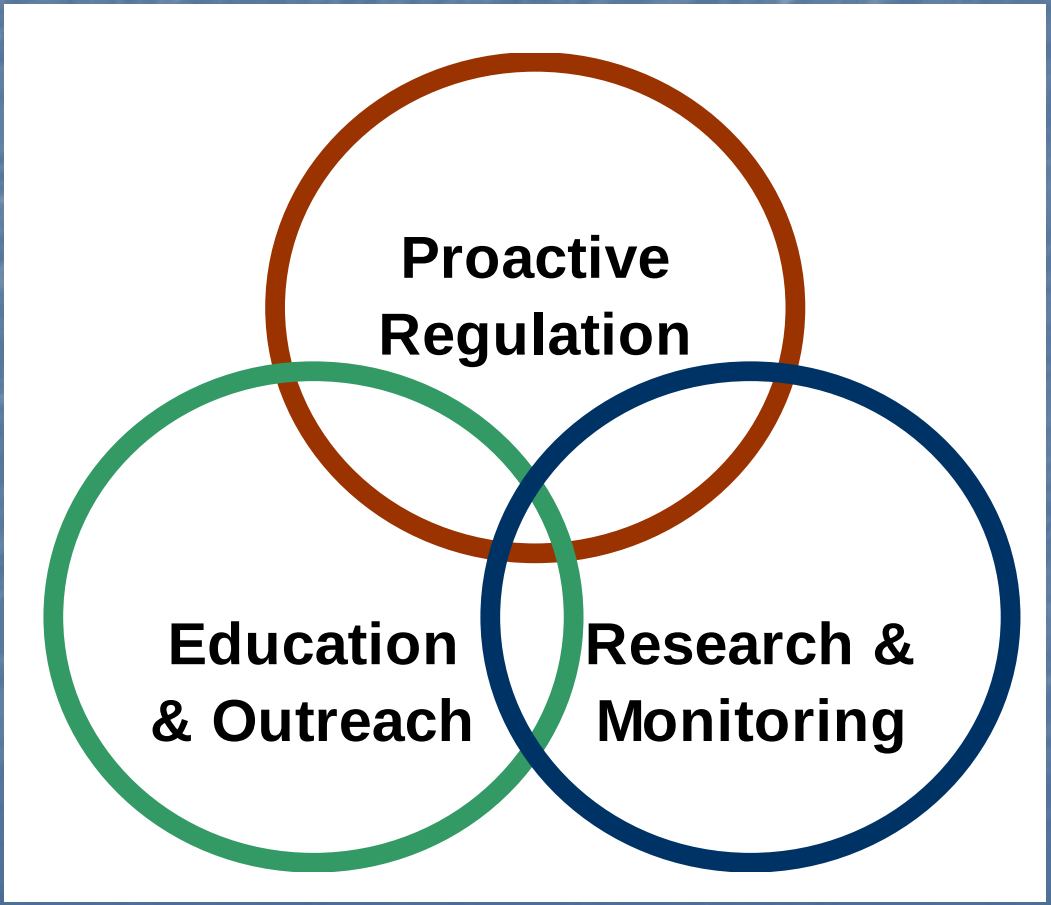
Clean Water Act Sets Tough Requirements for Municipalities

- NPDES permits
  - Municipalities and POTWs have full responsibility for:
    - Everything that flows to a sewer – test toxicity of effluent
    - Everything that flows through a storm drain
  - Can trigger violations subject to mandatory minimum penalties
  - Citizen lawsuits (Clean Water Act)

Federal Law Drives Water Quality Requirements in California

- Water Quality Standards
  - Required by Clean Water Act
  - Enforceable in permits
  - Numerical and narrative
  - Most California numerical standards developed by U.S. EPA
    - U.S. EPA only has numerical criteria for about 20 pesticides—this makes toxicity standards the compliance key for most pesticides
  - Compliance test methods set by U.S. EPA
- TMDLs

UP3 Project – Approach



Proactive Regulation

- Goal: To facilitate California water quality agency efforts to improve pesticide regulatory processes to prevent water quality impairment and NPDES permit compliance problems
  - Track relevant U.S. EPA, DPR regulatory processes
  - Identify specific information (including methodology and data gaps) that would be valuable to share with U.S. EPA and DPR
  - Where potentially significant risks are evident, identify risk mitigation options and seek their implementation
  - Review outcomes

Regulatory actions can achieve big reductions in pesticide use

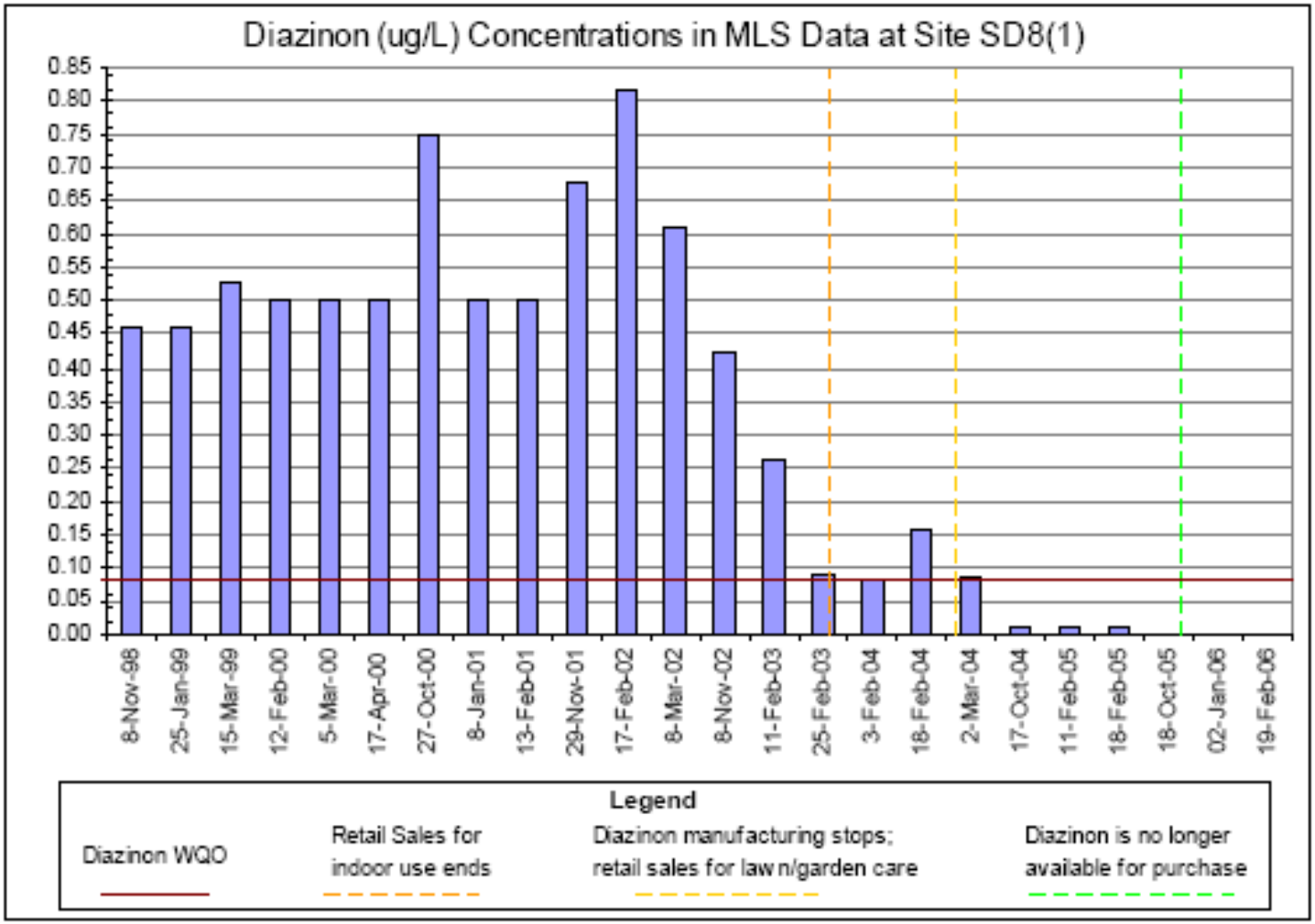
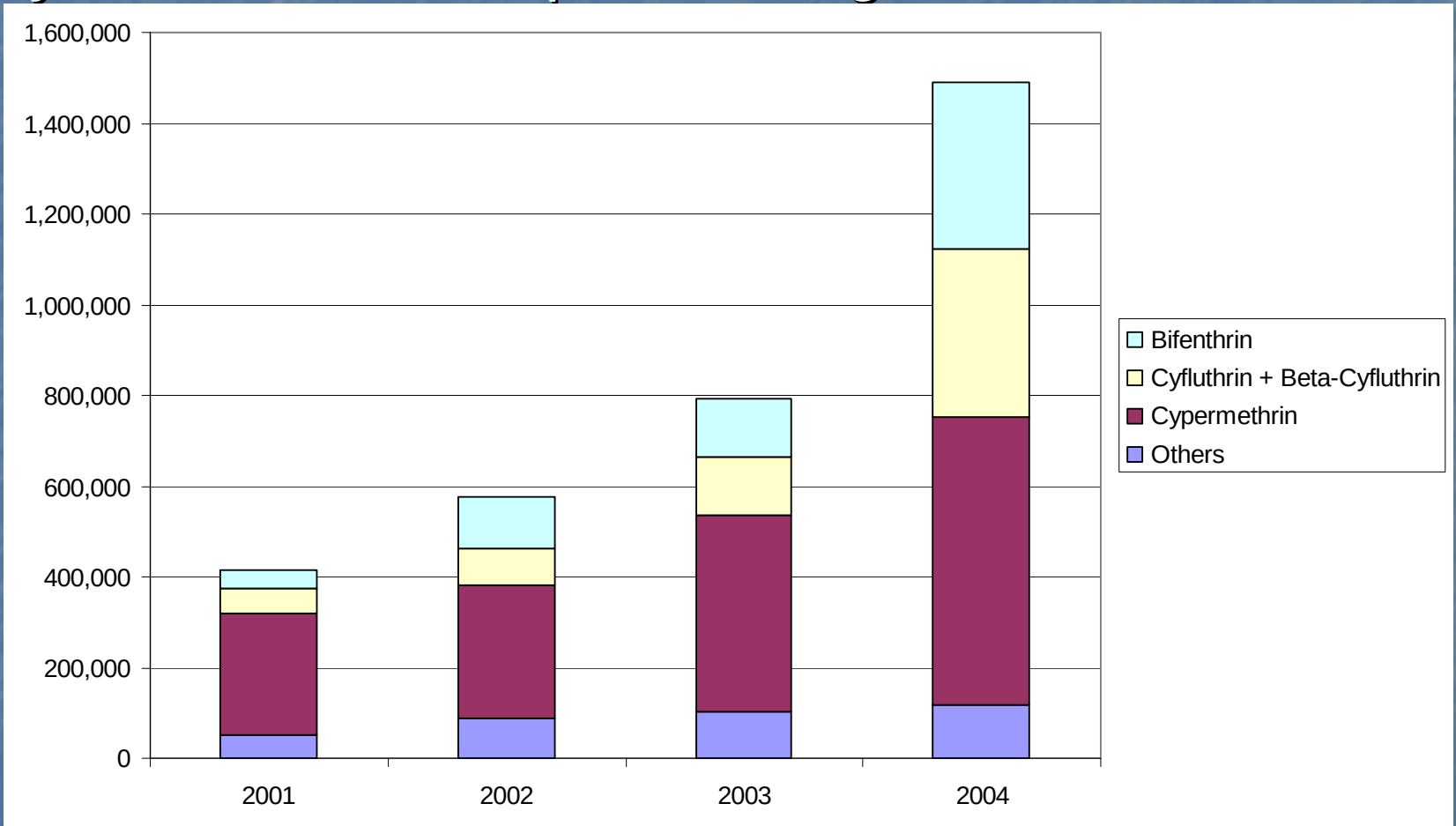


Figure 1-2. Diazinon Concentrations at Chollas Creek MLS Site SD8(1)

BUT Watch Out for Replacement Pesticides!
Pyrethroids Use Tripled During Diazinon Phaseout



- UP3 works to prevent new toxic alternatives

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

Research and Monitoring

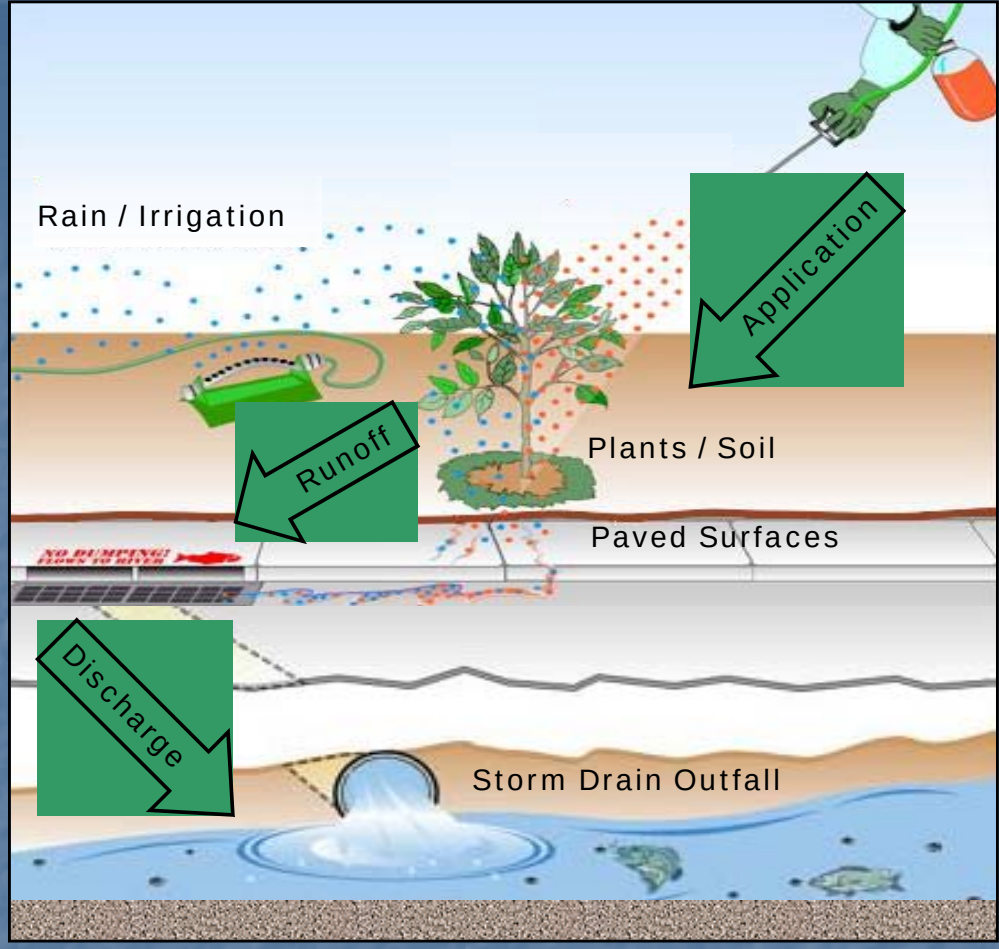
- Goal: To integrate the latest science and pesticide use information into California water quality agency urban pesticide mitigation activities
  - Track relevant research and monitoring activities
  - Distill and communicate the latest scientific information to water quality agencies
  - Review urban pesticide market
  - Identify potential water quality impacts of new pesticides (focus is on insecticides)

Education & Outreach

- Goal: Shift to IPM as less-toxic alternative. Perimeter sprays by professional structural pest control applicators to control ants account for more than 70% of pyrethroids applied in the Bay Area.
- Provide tools to municipalities to implement IPM on own facilities
  - Trainings
  - IPM Exchange network
  - Contracting support – how to buy IPM service
  - How to establish IPM policy/ordinance
- Different audience and methods from Our Water, Our World – homeowners, general

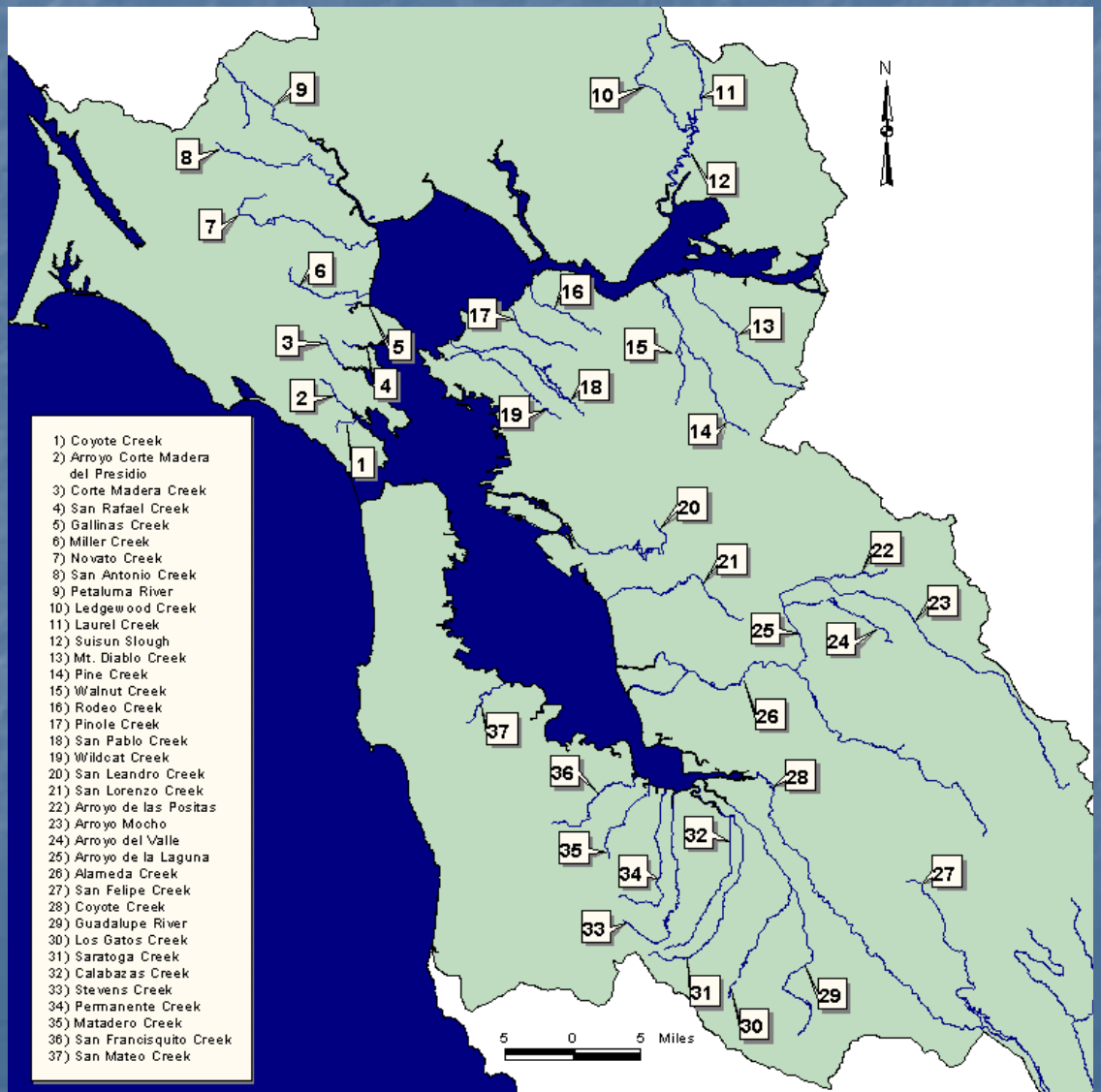
We Know That Pesticides Affect Runoff

Courtesy Sacramento Bee



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

Bay Area Creeks Impaired by Pesticide Toxicity



Toxicity to Aquatic Test Species *Hyallela azteca*

About 2 parts per trillion (ng/L) of most pyrethroids will paralyze or kill half the Hyalella in a sample. (96-hour)

Statewide Pyrethroids Toxicity Urban Creeks

Shorter Bars: Low-to-Zero Test Species Survival

Test Species Survival Rarely Exceeds 80%

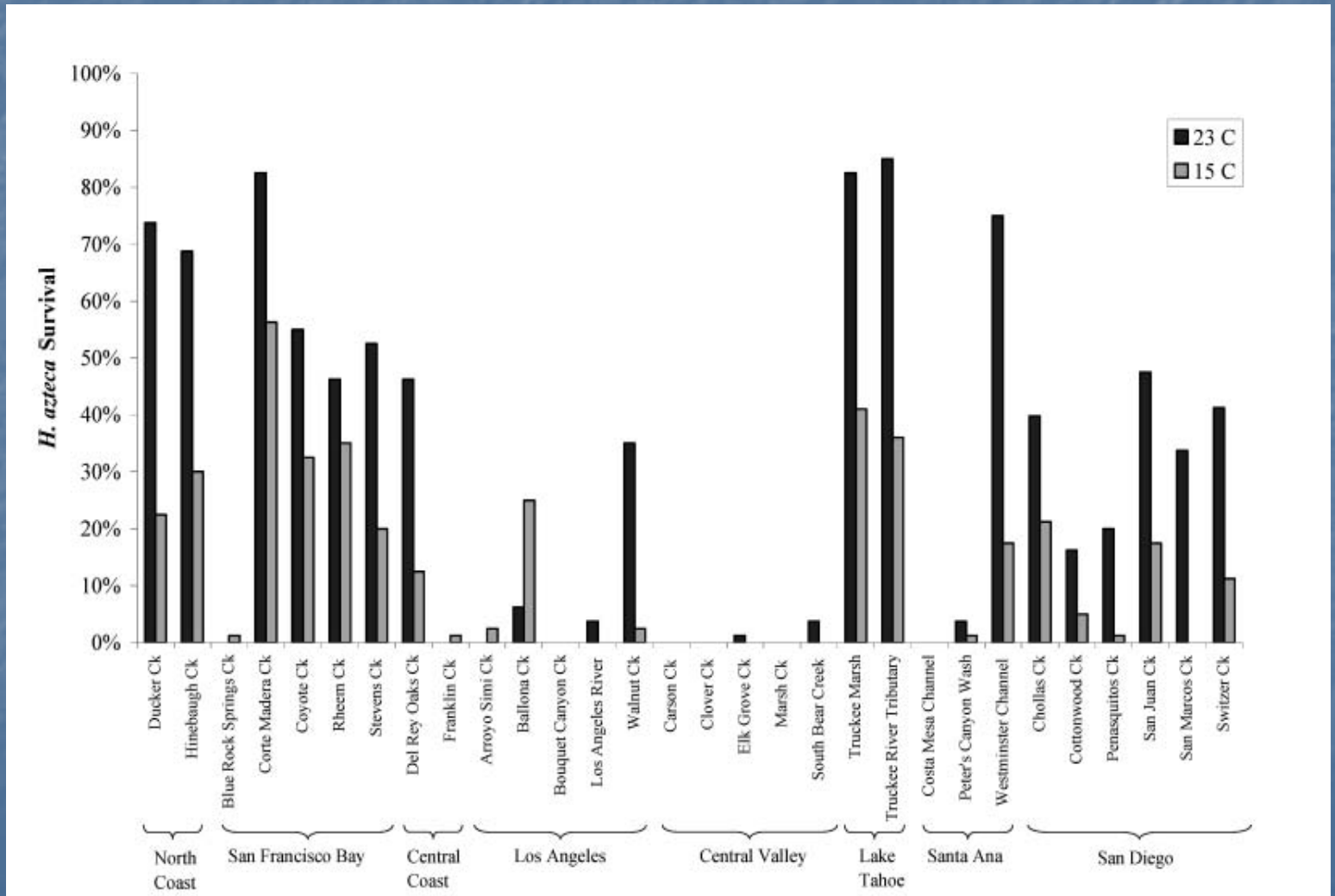
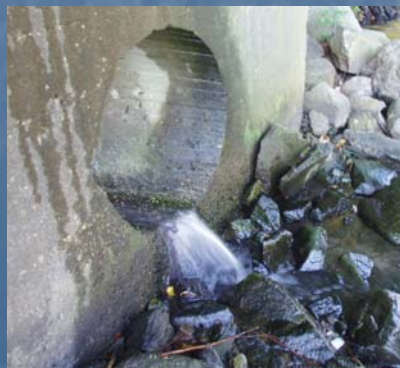


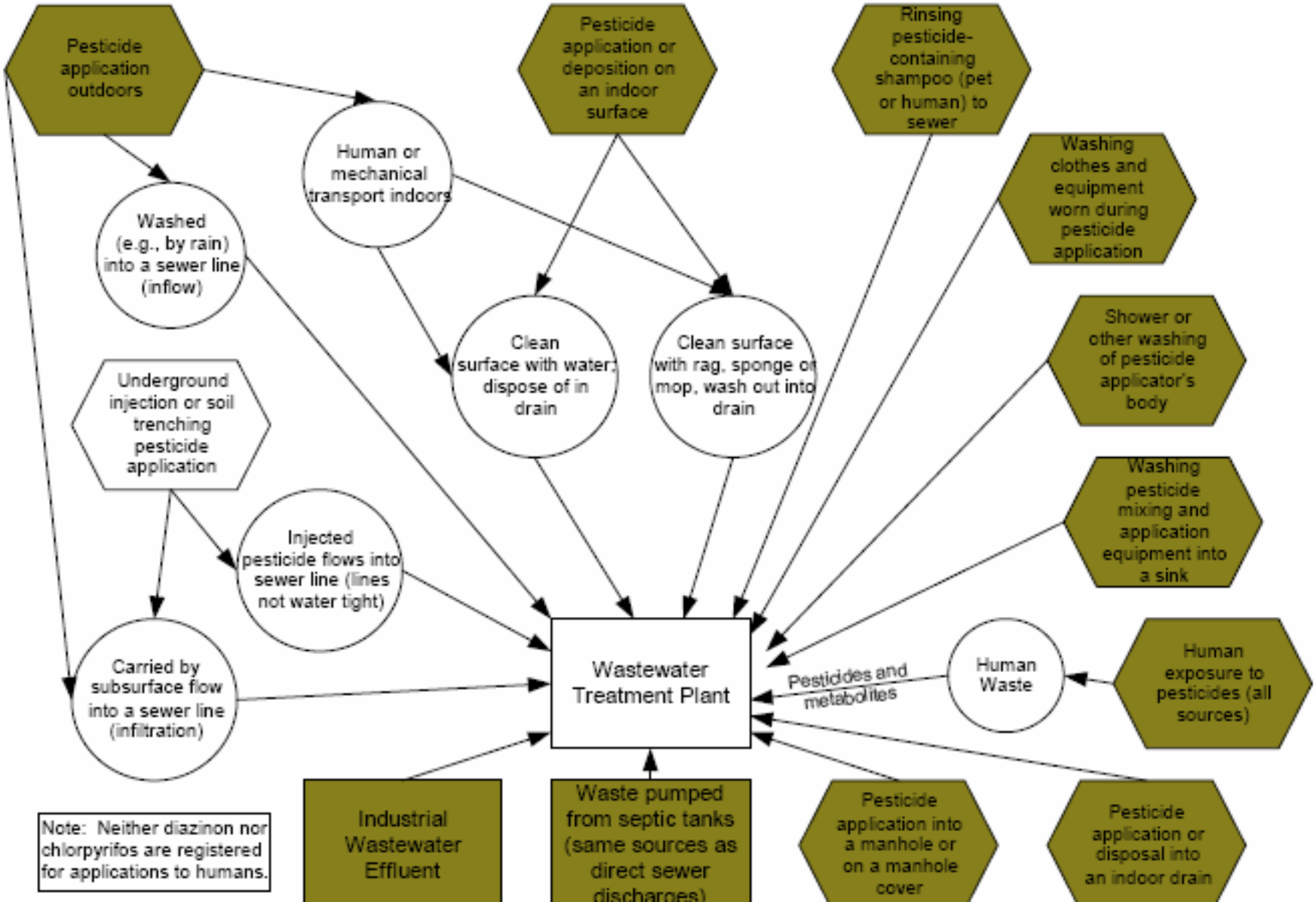
FIGURE 2. ***H. azteca*** **percent survival from sediment toxicity tests conducted at 23C and 15C with sediments from each urban creek.**

How Do Pesticides Affect Wastewater?

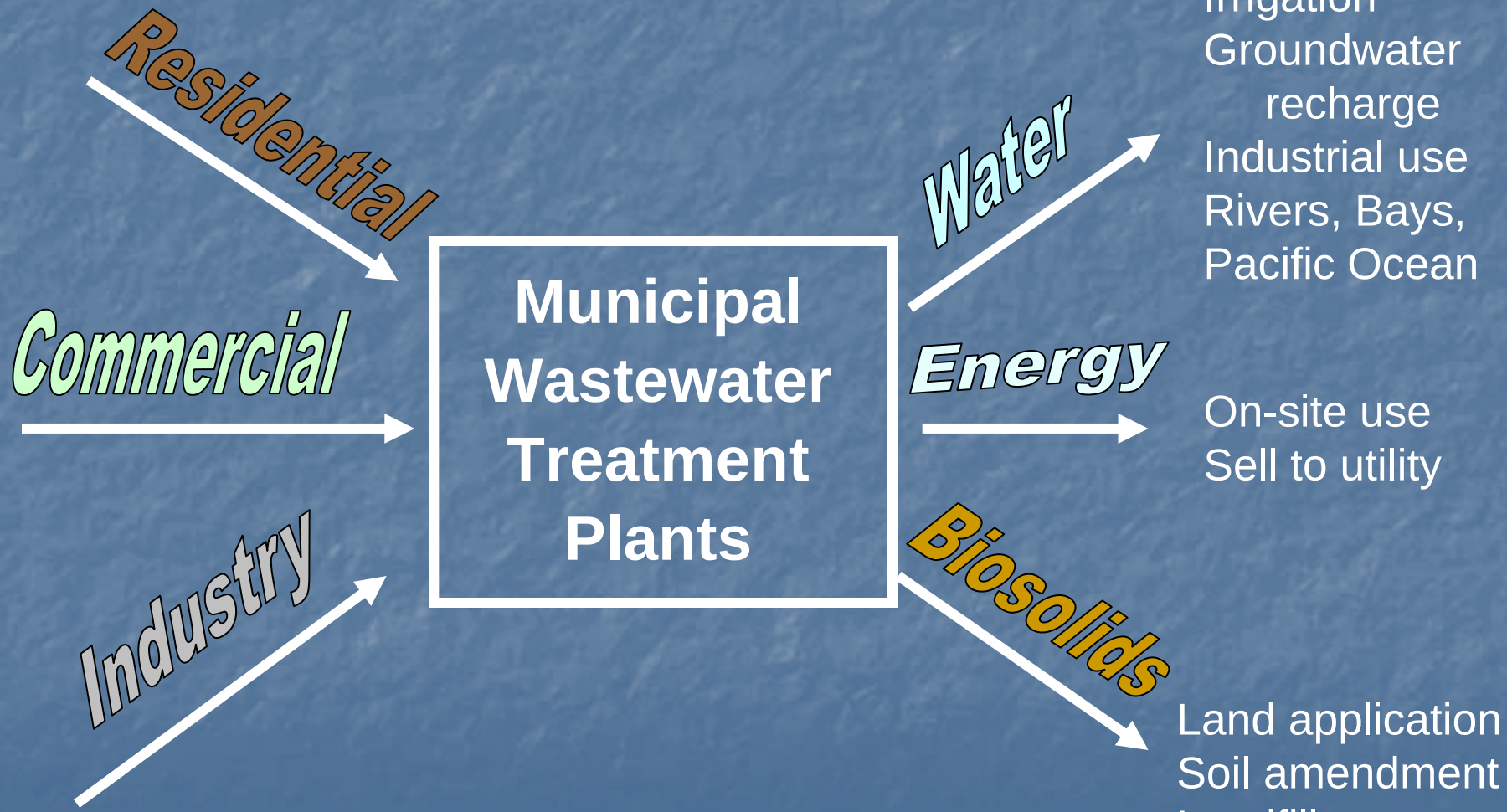
- Applications
  - Outdoors: aboveground, or underground injection (termites)
  - Indoors: pet or household pesticides
  - Direct to sewer
- Reaches WWTP via
  - Inflow: washed by rain into sewer line
  - Infiltration: carried by subsurface flow
  - Transport indoors/down the drain



Wastewater Carries Pesticides to POTWs, Biosolids, Recycled Water & Surface Water



Wastewater Carries Pesticides to Treatment, Sludge, & Surface Water



Slide courtesy L.A. County Sanitation Districts

Municipal Wastewater Treatment Plants Not Designed to Remove Pesticides

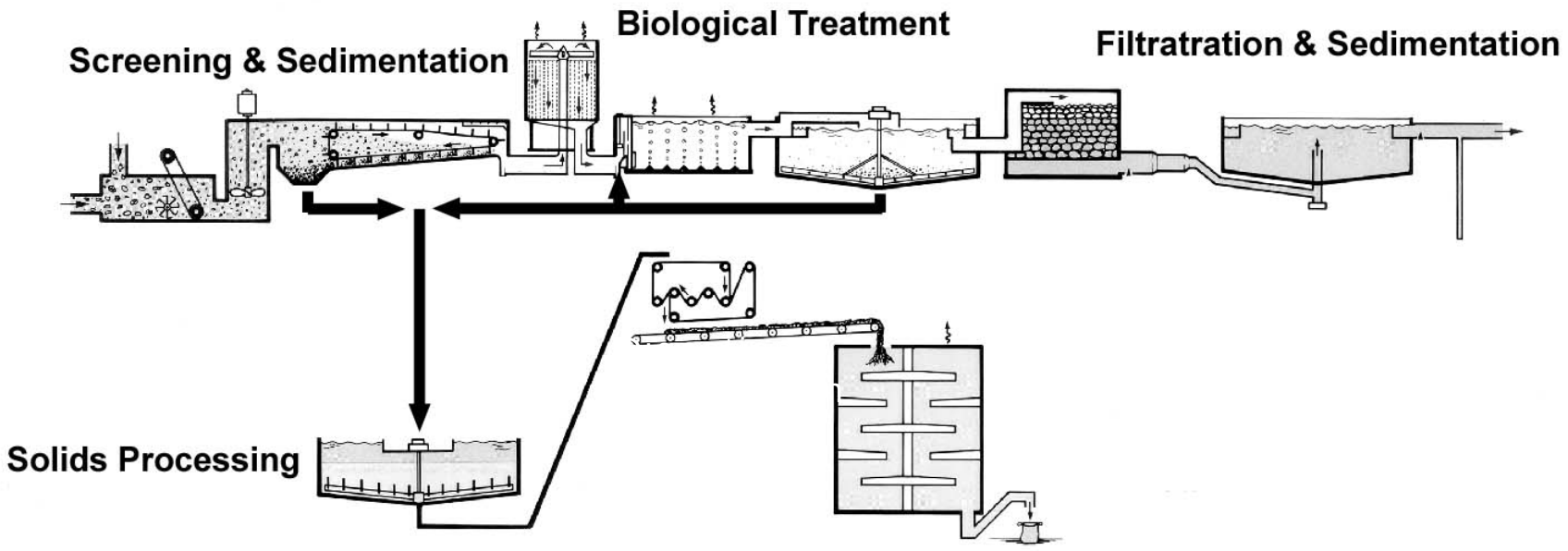


Figure courtesy Palo Alto Regional Water Quality Control Plant

Sacramento Bee, 7/14/09

Sacramento area is Delta's top pesticide source, study finds

By Matt Weiser
mweiser@sacbee.com

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Published: Tuesday, Jul. 14, 2009 - 12:00 am | Page 4B

Urban Sacramento is the leading source of pesticide contamination disrupting the Delta aquatic environment, according to new research on pollution in the estuary.

The study, led by UC Berkeley toxicologist Donald Weston, found enough pyrethroid pesticides in the American River to kill tiny shrimp – among the first links in the aquatic food chain.

Those pesticides likely reached the river from urban storm drains, which collect runoff from the Sacramento area's 1.4 million residents.

The study also found that among the water sources tested, Sacramento's regional wastewater treatment plant is the single largest source of pyrethroid pollution in the Delta. The plant discharges treated sewage into the Sacramento River near Freeport.

URBAN PESTICIDE POLLUTION

New research shows that urban Sacramento may be the largest source of pyrethroid pesticide pollution in the Sacramento-San Joaquin Delta. The chemicals most likely come from retail pesticides used by homeowners and commercial property owners.

State officials by next year plan to list several Sacramento-area creeks as "impaired" due to pyrethroid contamination, including Strong Ranch Slough, Chicken Ranch Slough, Elder Creek, Arcade Creek, Morrison Creek and Pleasant Grove Creek (not shown on map).

Sources: Central Valley Regional Water Quality Control Board; UC Berkeley toxicologist Donald Weston; Sacramento County Department of Water Resources

Don Weston's Recent Findings on Pyrethroid Pesticides in the Delta

See up3project.org/UPC/July meeting docs

Highlights: Pyrethroid toxicity examination focused entirely on water column samples, not sediment.

Essentially all urban runoff contains acutely toxic concentrations of pyrethroids.

The Sacramento POTW is the largest single discharger of pyrethroids to the Delta, because it has the largest flow. Its total annual pyrethroid mass discharge is estimated to be approximately equal to that of urban runoff from the Sacramento area.

Agricultural discharges can contain pyrethroids, but it's rare

Urban Pesticides Affecting Wastewater

- Pyrethroid insecticides
  - Bed bugs – pyrethroid treated mattress covers
  - DPR reevaluation process reviewing wastewater impacts
  - TMDLs coming – effluent limits could include mass, concentration, or both
- Biocides registered as pesticides: triclosan
- Other biocides used in swimming pools and spas, hospitals
- Copper- and silver-containing products as biocides (fabrics, surfaces)
- Indoor pesticide uses that reach WWTP

UP3 Recent Accomplishments

- Ended biocide tributyltin use in cooling water systems, wood preservative
- Outdoor use limited, prohibited during rain: Allethrins, Tetramethrin, Permethrin, Cypermethrin, Piperonyl Butoxide, MGK-264, Pyrethrins
- Phased out pesticide uses of lindane
- Changes in metam sodium use to protect WWTPs
- Requiring data to identify, reduce biocide toxicity (Antimicrobials Data Rule)
- Secured state action on pyrethroids: early regulatory review of the most toxic pesticides will result in major toxicity reductions after multi-year reevaluation
- New Federal label language on pyrethroids to protect water quality
- Major national effort to address regulatory gap: “harmonization” between U.S. EPA’s Office of Water and Office of Pesticide Programs could eliminate a major cause of pesticide toxicity
- WQ advisors appointed to U.S. EPA, DPR panels.

WWTP Involvement Needed

- State and Federal regulatory reviews have not always included impacts to wastewater
  - OPP-OW harmonization effort – OWM not yet included
- Proactive communication by UP3 Project identifies these impacts and provides tools for WWTPs to submit relevant data and comments
  - U.S. EPA needs data from POTWs on removal rates of silver for their work on silver and silver-containing antimicrobial compounds by 9/22

How to get involved

- Sign up for Urban Pesticides Committee email list – notifications of regulatory processes affecting wastewater, calls for data and comment, etc.
  - Email ahonore@waterboards.ca.gov
- Preeti Ghuman, Tri-TAC, a resource for more info (pghuman@lacsd.org)

Financial support for UP3 Project

- Bond freeze shutdown Dec 08 - April 09
- Stakeholder contributions: “lifeline” level April-Aug 09
  - Thank you BAPPG, BACWA, San Diego, San Francisco, Palo Alto
- Grant may restart under ARRA, lasting about 1 year. *Match funds* are needed.
- Transition to PARTNERSHIP model 2011: expect requests to support the UP3 Project

Funding supports:

- Technical consultant screening for regulatory actions that affect wastewater
- Notification when comment or data are necessary
- Support developing comments
- Work to reduce pesticide allowed uses (regulatory) and use practices (outreach), reducing load to WWTPs
- Work to integrate water quality and wastewater into pesticide regulatory processes

Questions?

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