



# Preventing Urban Pesticide Pollution in Stormwater

Pesticides Subcommittee  
Annual Report  
2013 – 2014



## Preface

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The California Stormwater Quality Association (CASQA) is comprised of stormwater quality management organizations and individuals, including cities, counties, special districts, industries, and consulting firms throughout California. CASQA's membership provides stormwater quality management services to more than 23 million people in California. This report was funded by CASQA to provide CASQA's members with focused information on its efforts to prevent pesticide pollution in urban waterways.

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## Disclaimer

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Cover Photo: The Russian River through the town of Guerneville. Photo taken by Stephanie Hughes.

Photo in Figure 1 and 4 of spraying pesticide along a garage was taken by Les Greenberg, UC Riverside.

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## Abbreviations Used in this Report

**BACWA** – Bay Area Clean Water Agencies

**BMPs** – Best Management Practices

**CASQA** – California Stormwater Quality Association

**CVRWQCB** – Central Valley Regional Water Quality Control Board

**CWA** – Clean Water Act

**DPR** – California Department of Pesticide Regulation

**EPA** – United States Environmental Protection Agency

**FY** – Fiscal Year (July 1 through June 30)

**MS4** – Municipal Separate Storm Sewer System

**OPP** – U.S. EPA Office of Pesticide Programs

**OW** – U.S. EPA Office of Water

**PPDC** – Pesticide Program Dialogue Committee

**PSC** – CASQA Pesticides Subcommittee

**RA** – Risk assessment

**SETAC** – Society of Environmental Toxicology and Chemistry

**SFBRWQCB** – San Francisco Bay Regional Water Quality Control Board

**TMDL** – Total Maximum Daily Load (regulatory plan for solving a water pollution problem)

**UP3 Partnership** – Urban Pesticides Pollution Prevention Partnership

**Water Boards** – California State Water Resources Control Board together with the California Regional Water Quality Control Boards

**Preventing Urban Pesticide Pollution in Stormwater  
Annual Report FY 2013-2014**

*California Stormwater Quality Association  
Pesticides Subcommittee*

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## Executive Summary

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To address the problems caused by pesticides in urban waterways in California, CASQA has collaborated with the Water Boards in a coordinated statewide effort, which we refer to as the Urban Pesticides Pollution Prevention (UP3) Partnership. By working with the Water Boards and other water quality organizations, we address the impacts of pesticides efficiently and proactively through the statutory authority of DPR and EPA's Office of Pesticide Programs (OPP). More than a decade of collaboration with UP3 partners, as well as EPA and DPR staff, has resulted in significant changes in pesticide regulation in the last four years. CASQA's 2013-14 activities and results are described in Section 2, including the following highlights:

- 💧 CASQA reviewed scientific literature in order to update and prioritize the Pesticide Watch List. CASQA's priority pesticides are **pyrethroids** (20 chemicals) and **fipronil**, followed by twelve other pesticide families, including **indoxacarb** and **cyantraniliprole**.
- 💧 CASQA prepared comment letters for 9 registration reviews letters and participated in numerous meetings and conference calls, focused on priority pesticides and long-term regulatory structure.
- 💧 CASQA provided presentations to DPR and professional associations; served on EPA, DPR, and Water Board policy and science advisory committees; and prepared and delivered public testimony.
- 💧 *As a result of requests by CASQA* and other agencies for better **urban runoff modeling**, DPR has devoted significant resources toward urban runoff model development and provided research funding to U.C. Davis and UC Riverside. **(See Section 2.4 for details.)**
- 💧 *In direct response to a joint CASQA and Water Board request based on CASQA's fipronil monitoring data*, DPR initiated an effort to address **fipronil** water pollution in California urban areas.
- 💧 *In direct response to CASQA and Water Board comments*, EPA modified its work plan for review of the **indoxacarb** to include urban uses.
- 💧 *As a result of requests by CASQA* and other agencies, DPR initiated development of procedure improvements to address three key scientific gaps in DPR's scientific reviews of new pesticide registration applications.
- 💧 *As a result of requests by CASQA* and other agencies, DPR and the Water Boards' expanded their partnership to monitor sediment toxicity and high priority urban pesticides (currently **pyrethroids and fipronil**) in representative California urban watersheds.

In 2014-15, CASQA will undertake numerous activities to continue to address near-term pesticide concerns and seek long-term regulatory change. Future near-term and long-term tasks are identified in Section 3.



## Section 1: Introduction

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This report by the Pesticides Subcommittee (PSC) of the California Stormwater Quality Association (CASQA) describes CASQA's activities related to the goal of preventing pesticide pollution in urban waterways from July 2013 through June 2014. The PSC works in collaboration with the California State and Regional Water Boards (Water Boards) and other stakeholders *to bring about change in how pesticides are regulated* by the United States Environmental Protection Agency (EPA) and the California Department of Pesticide Regulation (DPR), with the goal of ensuring that currently registered pesticides do not impair urban receiving waters. This collaborative effort is referred to as the UP3 Partnership.<sup>1</sup>

### Importance of CASQA's Efforts to Improve Pesticide Regulation

For decades now, the uses of certain pesticides in urban areas – even when applied in compliance with pesticide regulations – have adversely impacted urban water bodies. Under the Clean Water Act, when water bodies are impacted by pesticides, local agencies may be held responsible for costly monitoring and mitigation efforts. To date, some California municipalities<sup>2</sup> have incurred substantial costs to comply with Total Maximum Daily Loads (TMDLs) and additional permit requirements. In the future, more municipalities throughout the state could be subject to similar requirements, yet local agencies have no authority to restrict or regulate when or how pesticides are used<sup>3</sup> in order to proactively prevent pesticide pollution and avoid these costs.

Instead, pesticides are regulated by the EPA and DPR, which in some cases have not adequately protected urban water bodies from unreasonable adverse effects. Indeed, in 2013, CASQA compiled water and sediment sampling data that bears this out: pollution from some of the newer pesticides – pyrethroids and fipronil – is now present throughout urban water bodies in California at concentrations above the EPA chronic Aquatic Life Benchmarks for aquatic invertebrates in water.<sup>4</sup>

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<sup>1</sup> The UP3 Partnership collaborations are generally through information sharing, coordination of communications with pesticide regulators, and contributing staff time and other resources in support of the shared goal. The UP3 Partnership is an outgrowth of the UP3 *Project*, which shared a common goal. The former UP3 Project was a broader effort that included activities such as the Urban Pesticides Committee and the UP3 Project website, which are no longer actively supported.

<sup>2</sup> For example, Sacramento-area municipalities spent more than \$75,000 in the 2008-2013 permit term on pyrethroid pesticide monitoring alone; Riverside-area municipalities spent \$617,000 from 2007 to 2013 on pyrethroid pesticide chemical and toxicity monitoring.

<sup>3</sup> Local agencies in California have authority over their own use of pesticides, but are pre-empted by state law from regulating pesticide use by consumers and businesses.

<sup>4</sup> Ruby, Armand. 2013. Review of Pyrethroid, Fipronil and Toxicity Monitoring from California Urban Watersheds. Available at <https://www.casqa.org/LinkClick.aspx?fileticket=0%2btwBGMxunc%3d&tabid=194&mid=995>.

***Clearly, if we continue to conduct business as usual, more receiving waters will become impaired by urban pesticide use, and more local agencies will face increased monitoring, TMDLs, and permit requirements for pesticides. (Figure 1).***

For years, CASQA members have creatively tried to work around their lack of regulatory authority over pesticide use by pioneering award-winning public outreach and integrated pest management programs that encourage less-toxic alternatives. Local agencies also conduct collection events for banned pesticide products at their own cost. These “source control” efforts have established an extremely important and growing movement toward less-toxic alternatives; however, these activities fail to compensate sufficiently for the root problem: as currently implemented, pesticide regulatory actions at the state and federal levels do not adequately account for and mitigate potential water quality impacts from urban pesticide uses. With each new urban pesticide problem, local agencies face the potential of greater monitoring and source control requirements, neither of which promises to reduce pesticide-related toxicity locally or statewide.

**Figure 1. Our current pesticide regulator system does not adequately protect urban waterways.**





## Section 2: Results of CASQA 2013-2014 Efforts

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To prevent urban water quality impacts from registered pesticide uses, CASQA employs a two-pronged approach:

- 💧 Address near-term regulatory concerns
- 💧 Seek long-term changes in the pesticide regulatory structure

Given that at any given time there are dozens of pesticides with current or pending actions from the EPA or DPR, CASQA prioritizes regulatory tracking and communication efforts using the pesticide “Watch List” created by the PSC and the UP3 Partnership (Section 2.1). This prioritization aids CASQA and the UP3 Partnership in their prioritization of near-term efforts (Section 2.2).

Meanwhile, CASQA and the UP3 Partnership are also working on a parallel effort to effect long-term change in the regulatory process. By identifying the inadequacies and inefficiencies in the pesticide regulatory process, and persistently working with EPA and DPR to improve the overall system of regulating pesticides, CASQA and the UP3 are gradually achieving results (Sections 2.3 and 2.4).

### 2.1 Updated Pesticide Watch List

CASQA, working through the UP3 Partnership, tracks new scientific information about pesticides water pollution. In 2010, the UP3 published its Priority Pesticide List (also called the “Watch List”), which listed pesticides used in urban areas that are harming or threatening to harm surface water quality and provided a methodology to update this list. Based on this methodology, the PSC updates this list throughout the year, reviewing new scientific literature and monitoring studies as they are published. The PSC tracks this pesticides “Watch List,” along with other pesticide groups used outdoors in urban areas, presented in Table 1.

**Table 1. Pesticide Watch List developed by the PSC and the UP3 Partnership is regularly updated to prioritize regulatory concerns**

Priority	Basis for Priority Assignment	Pesticides	
<b>1</b>	Monitoring data exceeding benchmarks; linked to toxicity in surface waters; urban 303(d) listings	Pyrethroids (20 chemicals <sup>5</sup> ) Fipronil	
<b>2</b>	Monitoring data approaching benchmarks; modeling predicts benchmark exceedances; very high toxicity and broadcast application on impervious surfaces; urban 303(d) listing for pesticide, degradate, or contaminant that also has non-pesticide sources	Carbaryl Chlorantraniliprole Chlorothalonil (dioxins) Copper pesticides Creosote (PAHs) Cyantraniliprole	Dacthal (dioxins) Indoxacarb Malathion Pentachlorophenol (dioxins) Polyhexamethylenebiguanide Zinc pesticides
<b>3</b>	Pesticide contains a Clean Water Act Priority Pollutant; 303(d) listing for pesticide, degradate, or contaminant in watershed that is not exclusively urban	Arsenic pesticides Chlorpyrifos Chromium pesticides Diazinon Diuron	Naphthenates Simazine Silver pesticides Tributyltin Trifluralin
<b>4</b>	High toxicity and urban use pattern associated with water pollution; synergist for higher tier pesticide; on DPR or Central Valley Water Board priority list	Abamectin Acetamiprid Chlorinated isocyanurates DIDAC Dithiopyr Halohydantoin Hydramethylnon Imidacloprid Mancozeb MGK-264 Novaluron	Oxadiazon Oxyfluorfen Pendimethalin Phenoxy herbicides <sup>6</sup> Piperonyl butoxide Pyrethrins Spinosad/ Spinetoram Thiophanate-methyl Triclopyr Triclosan
<b>5</b>	Frequent questions from members	Glyphosate, Metaldehyde	
<b>None</b>	No tracking trigger	Most of the 1,000 existing pesticides	
<b>Unknown</b>	Lack of information. No systematic screening has ever been completed for urban pesticides.	Unknown	

<sup>5</sup> Allethrin, Bifenthrin, Cyfluthrin, Cyhalothrin, Cypermethrin, Cyphenothrin, Deltamethrin, Esfenvalerate, Etofenprox, Flumethrin, Imiprothrin, Metofluthrin, Momfluothrin, Permethrin, Prallethrin, Resmethrin, Sumethrin [d-Phenothrin], Tau-Fluvalinate, Tetramethrin, Tralomethrin.

<sup>6</sup> MCPA and salts, 2,4-D, 2,4-DP, MCPP, dicamba

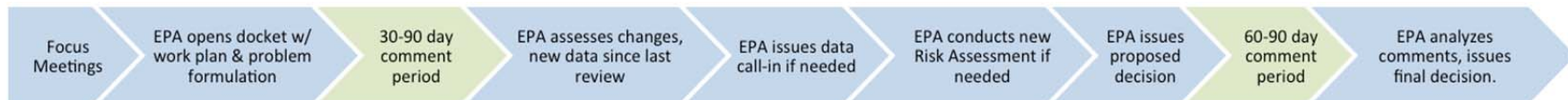
## 2.2. Results of Efforts Addressing Near-Term Regulatory Concerns

Immediate pesticide concerns may arise from regulatory processes undertaken at DPR or EPA. For example, when EPA receives an application to register a new pesticide, there may be two opportunities for public comment that are noticed in the Federal Register, as depicted in green in Figure 2 (below). EPA’s process usually takes less than a year while DPR typically evaluates new pesticides or major new uses of active ingredients within 120 days. While EPA must consider water quality in all of its pesticide registration decisions, numerous pesticide registration applications are not routed by DPR for surface water review (see sidebar)



**Figure 2. EPA’s New Pesticide Registration Process**

Another regulatory process, “Registration Review,” depicted below in Figure 3, is meant to evaluate currently registered pesticides about every 15 years, to account for new data available since initial registration. In general, it takes EPA 5-8 years to complete the entire process. EPA regularly updates its schedule for approximately 50 pesticides that will begin the review process in a given year.<sup>7</sup> In 2013-2014, CASQA wrote comment letters for 9 registration reviews, requiring an estimated 200 hours of work.



**Figure 3. EPA’s Registration Review – process to review registered pesticides at a minimum of every 15 years.**

<sup>7</sup> See [http://www.epa.gov/oppsrrd1/registration\\_review/schedule.htm](http://www.epa.gov/oppsrrd1/registration_review/schedule.htm) for schedule information.

DPR also has an ongoing, but informal review process (called continuous evaluation) that can address pesticides water pollution. If it needs to obtain data from manufacturers, DPR can initiate a formal action, called “Reevaluation.” DPR reviews of pyrethroids and fipronil in urban runoff have occurred in response to CASQA and Water Board requests. These have involved ongoing communication with CASQA and the UP3 Partnership.

Table 2 presents a summary of recent activities and their associated results to address near-term regulatory concerns. The many positive outcomes in Table 2 reflect the success of CASQA’s teamwork in the UP3 Partnership. Much of this work occurs during formal public comment periods. To accomplish this, CASQA monitors the Federal Register and DPR’s website for notices of regulatory actions related to new pesticide registrations and registration reviews. CASQA watches for pesticides that appear to have any of the following characteristics: proposed urban, outdoor uses with direct pathways for discharge to storm drains, high aquatic toxicity, or containing a priority pollutant. Note that participating in these regulatory processes can take many years to complete.

As can be seen in the Table 2, CASQA has had considerable success in working with DPR and the Water Boards. Our mixed results with EPA indicate that there are opportunities for further communications and discussions.

#### **Pesticides Not Routed by DPR for Surface Water Review**

During meetings with DPR in 2013-14, CASQA learned that within DPR’s formal routing procedure, it does not route pesticides for surface water review in the following categories that are of interest with respect to urban water quality:

- Antimicrobial products (e.g., silver, copper, tributyltin)
- Indoor products (potential for subsequent sewer discharges)
- New uses of currently registered pesticides except for aquatic, rice, fipronil, and marine antifouling coating products (therefore new uses of pyrethroids, indoxacarb, copper, and similar pesticides are not reviewed)

**Table 2. Results of FY 2013-14 Efforts Communicating Near-Term Regulatory Concerns<sup>8</sup>**

Regulatory Action or Concern	CASQA Efforts			Partner Support	Results and notes
	Letter(s)	Call(s)	Mtg(s)		
<b>DPR</b>					
Fipronil water pollution		✓	✓	SFBRWQCB CVRWQCB State Board BACWA	<b>Success!</b> DPR acknowledged importance of this issue, and committed to develop an action plan to address fipronil water pollution. Informal outline provided to CASQA, pending DPR communication with registrant.
New Fipronil product registration application				State Board	<b>Success!</b> DPR agreed to route this registration application to its surface water program for review and disclosed that DPR has decided to conduct surface water reviews of all fipronil product registration applications.
New Metofluthrin product registration application	✓				<b>Success!</b> DPR agreed to route this registration application to its surface water program for review. (Per the sidebar on page 8, such reviews are not currently conducted automatically.)
Cupron Antifungal Fibers & Pro Fibers and Cliniweave (PHMB) Registration Applications				BACWA	<b>Success!</b> DPR agreed to route this registration application to its surface water program for review. (Per the sidebar on page 8, such reviews are not currently conducted automatically.)
Cyantraniliprole products proposed registration	✓	✓	✓	CVRWQCB SFBRWQCB	<b>Pending.</b> (Asked DPR to avoid registration unless mitigation measures ensure they will not pollute urban runoff.)
Trelona - Novaluron - Product Registration Application	✓				<b>Success!</b> DPR agreed to route this registration application to its surface water program for review. (Per the sidebar on page 8, such reviews are not currently conducted automatically.)
Pathshield Antimicrobial Filter Media Registration Application <sup>9</sup>	✓	✓			<b>Success!</b> DPR agreed to route this registration application to its surface water program for review. (Per the sidebar on page 8, such reviews are not currently conducted automatically.)

<sup>8</sup> Color coding in this table is meant to reflect the “Watch List” prioritization color coding in Table 2.

<sup>9</sup> Active ingredient is 3-(Trihydroxysilyl)propyl dimethyl octadecyl ammonium chloride



Regulatory Action or Concern	CASQA Efforts			Partner Support	Results and notes
	Letter(s)	Call(s)	Mtg(s)		
<b>EPA</b>					
Metofluthrin Registration Review Work Plan	✓	✓		CVRWQCB SFBRWQCB	Result: CASQA and the Water Boards provided input to OPP on its metofluthrin review work plan, because OPP did not propose to examine water quality risks. OPP instead proposed to terminate its review. Terminating metofluthrin's review opens the door to continued increases in use without measures to prevent water pollution. Ending its Registration Review also prevents OPP from requiring metofluthrin products to implement mitigation measures required in the future for other pyrethroids.
Momfluorothrin Registration Application	✓			SFBRWQCB	Pending (anticipated October 2014)
Indoxacarb Registration Review Work Plan	✓	✓		CVRWQCB SFBRWQCB	<b>Success!</b> EPA will modify its work plan to address urban uses, substantially expand data requirements to obtain environmental fate and aquatic toxicity data for indoxacarb and its stable, toxic degradates, and will require development and validation of chemical analysis methods.
Cyantraniliprole products proposed registration	✓	✓		SFBRWQCB	Result: Decision appeared to sidestep most comments, arguing that benefits outweigh risks. EPA did not modify label to minimize use on impervious surfaces because registrant did not agree to do so.
Copper sulfate antimicrobial registration application	✓			SFBRWQCB	Pending.
Cuprous Iodide (cupron fabric) Registration Application				BACWA	Pending.
Silver/Zinc marine antifouling paint registration application				State Board and multiple regions	Pending.
Halohydanitins Registration Review Work Plan	✓			BACWA	Result: U.S. EPA thanked CASQA and BACWA for their comments and affirmed its commitment to continuous improvement of its procedures.
2,4-DP Registration Review Work Plan				CVRWQCB SFBRWQCB	<b>Partial Success.</b> EPA will evaluate the common toxic degradate of 2,4-DP and other phenoxy herbicides, 2,4-DCP, but will not require toxicity data on degradate because there are some literature data, which it may supplement with ECOSAR modeling and any data supplied by the registrant. It will qualitatively assess toxicity of mixtures of phenoxy herbicides.

Regulatory Action or Concern	CASQA Efforts			Partner Support	Results and notes
	Letter(s)	Call(s)	Mtg(s)		
Triclosan Registration Review	✓			BACWA CVRWQCB SFBRWQCB	<i>Little Success.</i> In response to comments on the preliminary work plan, the work plan clarified that chronic, spiked-sediment benthic invertebrate testing for two freshwater and one estuarine/marine species was already required. Largely disregarded other requests such as to modify the proposed ecological risk assessment to address transport via urban runoff to surface waters, because it has elected to assess only pesticidal triclosan uses, which EPA believes to represent less than one percent triclosan use; therefore “contribution of triclosan from pesticidal uses that would lead to storm water releases is negligible relative to the releases from all non-pesticidal uses.”
MCPA Registration Review Work Plan				CVRWQCB	Pending (anticipated August 2014)
Thiophanate methyl and Carbendazim Registration Review Work Plan				CVRWQCB	Pending (anticipated August 2014)
<b>Water Boards</b>					
Proposed TMDL for Toxicity and Pesticides in the Santa Maria Watershed	✓	✓	✓		<b>Mostly success!</b> On July 2, 2014, the State Board approved the TMDL, the first California Water Board pyrethroids TMDL. There was clear recognition among State Board members that pesticides are an urban issue and that municipalities do not have the ability to regulate pesticides. The Board staff’s response to comments also firmly supported CASQA’s recommended approach to pesticides management, noting that “...this collaborative approach may be the most effective way to address impairments driven from urban pesticide use.” The TMDL implementation plan relies on toxicity targets that will likely be achieved through DPR’s pyrethroids regulations, but it references target water concentrations that are likely unattainable without an EPA or DPR pyrethroids sales ban, which is unlikely to occur.

## 2.3 Long-Term Change in the Pesticides Regulatory Structure

CASQA envisions a future in which the pesticide regulatory structure is used proactively to restrict pesticide uses that have the potential to cause urban water quality problems. There are several processes currently under way at both EPA and DPR that will move us closer to that future. Many of these processes were prompted by the persistent work of CASQA and the UP3 Partnership to educate EPA and DPR staff on the problems with current approaches. Table 3 presents a summary of major actions undertaken and results achieved in FY 2013 – 2014 toward long-term changes in how pesticides are regulated. More than a decade of collaboration with UP3 partners, as well as EPA and DPR staff, has resulted in significant changes in pesticide regulation in the last four years. Table 6 in the Appendix highlights some of the most important achievements in which CASQA and the UP3 Partnership played a key role in advocating for and shaping the final regulation or policy change.

**Table 3. Results of FY 2013-14 Efforts Seeking Long-Term Regulatory Change**

Activity	Results and Notes
<b>DPR</b>	
Methodology for Evaluating Pesticide Registration Applications for Surface Water Protection	<b>Success!</b> DPR successfully implemented the first version of a procedure to evaluate the first pesticide registration applications for most of the types of pesticides that CASQA for potential water quality impacts. In 2013-2014, DPR denied registration applications. For several approved products, DPR required registrants to provide chemical analysis methods suitable for use by surface water monitoring programs. DPR also began updating the scientific methods behind the review procedures to improve evaluation of building perimeter sprays.
Monitoring effectiveness of and compliance with DPR Surface Water Regulations	<b>Success!</b> DPR has taken the leading role in conducting monitoring to evaluate the effectiveness and level of compliance with the regulations. DPR has begun presenting its initial monitoring results to stakeholders. <sup>10</sup> DPR is working with Agricultural Commissioners and structural pest control industry to evaluate and improve level of compliance.
Urban Runoff Modeling	<b>Success!</b> Recognizing the deficiencies in OPP's pesticide registration process, <sup>11</sup> DPR is developing an urban runoff modeling tool. As part of that effort, in 2013-14 they published peer-reviewed papers regarding the modeling of pesticide washoff from impervious surfaces. <b>For details, see Section 2.4.</b>

<sup>10</sup> For a sample presentation, see “Pyrethroid Detections in Urban surface Waters Post Regulations,” by Mike Ensminger and Robert Budd, DPR, January 2014 at [http://cdpr.ca.gov/docs/emon/surfwttr/presentations/ensminger\\_2014\\_jan\\_13\\_pyrethroid\\_trends.pdf](http://cdpr.ca.gov/docs/emon/surfwttr/presentations/ensminger_2014_jan_13_pyrethroid_trends.pdf).

<sup>11</sup> OPP is using its agricultural runoff model (PRSM/EXAMS) for urban runoff and looks at wastewater with a model developed for Toxic Substances Control Act implementation. The "urban" scenarios used in the urban runoff modeling have significant shortcomings, as do the wastewater discharge modeling scenarios.

Activity	Results and Notes
DPR's Pest Management Advisory Committee (PMAC).	<i>Success!</i> Participation on the PMAC has increased DPR's focus on urban pest management and water quality issues and has generated funding for urban integrated pest management programs. DPR funded BASMAA proposal to increase adoption of IPM in multi-family housing.
<b>EPA</b>	
Pyrethroids Registration Review.	<i>Pending.</i> By the end of 2013, EPA had initiated reviews of all pyrethroids. CASQA and UP3 continue ongoing engagement, which has improved scientific accuracy of work related to urban runoff and continues to educate EPA and registrants about the water quality regulatory context for their decisions. The PSC and UP3 Partnership had multiple informal interactions with EPA and registrants about scientific topics related to EPA's pyrethroids reviews. EPA's first pyrethroids risk assessments are anticipated in 2015.
Antimicrobial Pesticides Evaluations.	<i>Promising.</i> Prior PSC/UP3 engagement caused EPA to expand its data requirements for antimicrobial pesticides (particularly to address wastewater discharges) and to integrate a process for identifying all of the pathways by which antimicrobial products can reach the MS4 into antimicrobial pesticide reviews. Informal educational interactions continued in 2013-2014. An important test of the new procedures will occur in 2015, when EPA completes a risk assessment for copper pesticides.
Preferred Approach for Pesticide Monitoring and Management in Permits and TMDLs.	<i>Pending.</i> Met informally with key EPA Region 9 Water Division staff in Sacramento. Will continue communications in 2014-15.
Water Quality Data	<i>Success.</i> Convinced OPP that upcoming modifications to OPP water quality data should establish that OPP staff obtain data from California databases rather than asking California agencies for these data.
US EPA's advisory committee, Pesticide Program Dialogue Committee (PPDC)	<i>Promising.</i> PSC attended PPDC in December 2013 (teleconference) and June 2014. Participation on PPDC and face-to-face meetings with OPP staff and management has helped increase OPP's focus on urban pest management and water quality. PSC met with OPP staff to discuss progress in OW/OPP common effects methodology. PSC participated in Integrated Pest Management workgroup, which made significant progress in promoting school IPM.

Activity	Results and Notes
<b>Engagement with Water Boards</b>	
Preferred Approach for Pesticide Monitoring and Management in Permits and TMDLs.	<i>Promising.</i> Water Boards are developing statewide approach for addressing pesticide impairment that recognizes limitations of local agencies, and acknowledges key role of DPR. This has been demonstrated in language recently included in Regions 2 and 3 Basin Plan amendments to address pesticides (see excerpts from the Santa Maria Basin Plan Amendment <sup>12</sup> immediately following this table). It has also been recognized by State Water Board staff working on its statewide Stormwater Strategy, as part of the “true source control” element of the strategy. PSC provided informal outline of preferred approach to Water Board staff that are leading this effort.
Coordinated Pesticides Monitoring in Urban Watersheds.	<i>Promising.</i> State Water Board and DPR continued coordinated urban monitoring for pyrethroids and fipronil. Steps to improve coordination with MS4 monitoring requirements are in progress in upcoming TMDLs and the Phase II monitoring program design. The Water Boards are considering development of a coordinated approach for urban pesticides monitoring as part of the statewide approach to pesticides management (see above). The PSC has written a letter, developed a summary of MS4 pesticides monitoring, met with Water Boards and DPR managers, and sent a letter to the Water Boards toward its goal of improving the value and cost-effectiveness of urban pesticides monitoring.
<b>Other Agencies</b>	
California Structural Pest Control Board (SPCB)	<i>Success!</i> A PSC member is an appointed member of the SPCB. The SPCB recognized the potential for excessive pesticide application to impact water quality. SPCB appointed an ad hoc committee to develop recommendations for promulgating regulation changes in continuing education requirements aimed at increasing IPM adoption and reducing water quality impacts by licensees.
University of California Statewide IPM (UCIPM)	<i>Success!</i> PSC participated in UCIPM’s Urban and Community IPM Advisory Committee in May 2013. Long term, continuing engagement with UCIPM has resulted in increasing focus and commitment to urban pesticide and pest management issues. In 2014 this includes continuing publication of “Retail Nursery and Garden Center IPM News” <sup>13</sup> , establishment of an IPM blog “Pests in the Urban Landscape” <sup>14</sup> , and continuation of a series of urban IPM YouTube videos <sup>15</sup> .

<sup>12</sup> [http://www.waterboards.ca.gov/centralcoast/water\\_issues/programs/tmdl/docs/santa\\_maria/pesticide/skof\\_pest\\_tmdl\\_att1\\_resoln\\_bpa\\_apprvd.pdf](http://www.waterboards.ca.gov/centralcoast/water_issues/programs/tmdl/docs/santa_maria/pesticide/skof_pest_tmdl_att1_resoln_bpa_apprvd.pdf)

<sup>13</sup> <http://www.ipm.ucanr.edu/RETAIL/retail-newsletter.html>

<sup>14</sup> <http://ucanr.edu/blogs/UCIPMurbanpests/index.cfm>

<sup>15</sup> <http://www.youtube.com/user/UCIPM/videos>



Activity	Results and Notes
<b>Major Presentations</b>	<b>Results</b>
The Future of Pesticides & Toxicity Monitoring - CASQA Conference, Sept 2013	Success! Educated diverse audiences on nexus of urban pesticide regulation and water quality and the key scientific issues involved in identifying, addressing, and preventing pesticides water pollution. The PSC had more than twice as many presentation invitations and opportunities than its resources allowed it to accept.
Implementing the Urban Creeks Pesticides TMDL - Early Victories on the Long Road to Solutions - State of the Estuary (San Francisco), Sept 2013	
Fipronil Water Quality Overview – Presentation to DPR, Jan 2014	
Fipronil Water Quality Overview - Bay Area Clean Water Agencies - Bay Area Pollution Prevention Group, Feb 2014	
Pyrethroids & Fipronil - California Water Environment Association Annual Conference, May 2014	
Fipronil Water Pollution and Its Sources - Northern California Society of Environmental Toxicology and Chemistry, May 2014	

**The 2014 Santa Maria Basin Plan Amendment (BPA) acknowledges the key role of DPR in TMDL implementation:**

*“The TMDL implementation plan also utilizes an interagency approach among the California Department of Pesticide Regulation (DPR), the State Water Resources Control Board, and the Central Coast Water Board to address impairments. The approach is described in the California Pesticide Management Plan for Water Quality (California Pesticide Plan), which is an implementation plan of the Management Agency Agreement (MAA) between DPR and the Water Boards.”*

*“The Department of Pesticide Regulation, the county agricultural commissioners, and USEPA are taking regulatory steps to address pesticide impairments. In accordance with the MAA, DPR has approved urban pesticide regulations to address pyrethroid pesticide water quality pollution. Also as part of the MAA, the Central Coast Water Board, DPR, and the commissioners are coordinating on county chlorpyrifos use permits.”*

## 2.4 A CASQA Success Story – DPR’s Urban Modeling Research

Pesticide application to impervious surfaces for activities such as structural pest control can be a major source of pesticide washoff in subsequent rainfalls or over-spray during irrigation. For some time, DPR has been following CASQA’s communications with OPP about the deficiencies in OPP’s urban modeling. DPR agrees with CASQA’s approach and understands that models that better estimate surface water pesticide concentrations from urban pesticide use are needed. Since OPP is not moving toward urban models, DPR determined that it should develop its own urban modeling capacity and added two staff members with urban modeling experience. The current direction includes:

(1) Short term - develop a more appropriate urban modeling scenario for OPP’s existing agricultural runoff model (2014).

(2) Long term - build both urban runoff and POTW modeling capacity. DPR is using its intensive urban monitoring watersheds as example locations to support the model development. DPR has been conducting special studies in support of the long-term modeling effort.

As part of this effort, peer-reviewed papers are being published by DPR scientists seeking to characterize and model pesticide washoff from concrete surfaces.<sup>16,17</sup> These and future modeling efforts by DPR are expected to provide valuable insights and improve the analysis of surface water quality impacts in future risk assessments.

### Highlights from DPR’s Research

DPR and University of California researchers are evaluating previous models and are seeking to develop models that better predict pesticide washoff and incorporate a number of variables, including:

- product formulation
- chemical properties (e.g. hydrophobicity)
- aging effects
- multiple applications
- rainfall duration
- rainfall intensity
- number of rainfall events

In the 2013 study referenced below, a model was developed that predicted the washoff of five different pyrethroids in 15 different scenarios. Preliminary results suggest that modeling can be used to predict pesticide washoff and thus provide technical support to risk assessments in urban settings. In the 2014 study, researchers conducted controlled rainfall events and monitored the washoff of commercial pesticides with eight active ingredients. The results formulated the basis for their model, which then was then tested with a set of 21 datasets from 38 different rainfall events. According to the study, the model “satisfactorily captured pesticide mass loads and their temporal variations” for both hydrophobic and hydrophilic pesticides and under a varied number of rainfall events (1-7) and under a wide range of timescales (from hours to hundreds of days).

<sup>16</sup> Y. Luo, F. Spurlock, W. Jiang, B. Jorgenson, T. Young, J. Gan, S. Gill, K. Goh. 2013. Pesticide Washoff From Concrete Surfaces: Literature Review and a New Modeling Approach. [Water Research](#).

<sup>17</sup> Y. Luo, B. Jorgenson, D. Thuyet, T. Young, F. Spurlock, and K. Goh, 2014. Insecticide Washoff from Concrete Surfaces: Characterization and Prediction. *Env. Sci. & Tech.*, 48(1):234-243. (<http://pubs.acs.org/doi/abs/10.1021/es4028343>) [Author’s Version, PDF](#).

## Section 3: CASQA’s Approach Looking Ahead

### 3.1 CASQA’s Continuing Approach

At any given time, EPA and DPR may be in the process of evaluating and registering various pesticides for urban use. To address near-term concerns that may arise out of these ongoing pesticide regulatory processes, CASQA and the UP3 Partnership continuously track and engage in EPA and DPR activities. Typically, these efforts press for changes in an individual product’s registration or request that regulators obtain more data from manufacturers. CASQA and the UP3 Partnership are also working on a parallel effort to effect long-term change in the regulatory process. The types of activities that CASQA and the UP3 Partnership engage in are presented Table 4. Many of these activities work to address both near-term concerns and the longer-term goal of systemic regulatory change.

**Table 4. Types of Activities Undertaken to Address Immediate Pesticide Concerns and Long-term Regulatory Change**

Activity	Purpose	Level of Effort	
Regulatory Tracking	Track Federal Register notices	Identify regulatory actions that may require review.	Daily review; analyze EPA’s scientific work and provide notification to CASQA members and partners as needed.
	Track DPR notices of evaluations and decisions	Identify potential problems with current DPR evaluation or registration plans other regulations, procedures & policies.	Weekly review; obtain water quality assessments from DPR through public record requests; analyze and provide notification to CASQA members and partners as needed.
	Track activities at the Water Boards	Identify opportunities for improvements in TMDLs, Basin Plan Amendments, and permits.	Often weekly phone calls with Water Board staff; weekly review of noticed proceedings; review scientific information.
	Review regulatory actions, guidance documents, and work plans	Identify potential problems with current EPA evaluation or registration plans, other regulations, procedures, and policies.	According to need as identified by tracking activities (average of 4 per month).
Regulatory Communications	Briefing phone calls, teleconference meetings, and emails with EPA and DPR	Information sharing about immediate issues or ongoing efforts; educate EPA and DPR about issues confronting water quality community. Provide early communication on upcoming proceedings that help reduce the need for time-intensive letters.	As needed, but often several times per week.
	Convene meetings, write letters and track responses to letters	Ensure current pesticide evaluation or registration process addresses potential water quality concerns, and take advantage of opportunities to formally suggest solutions to shift regulatory process in the future.	Typically a dozen or so pesticides annually that could pose threats to water quality if EPA or DPR does not initiate certain procedures. Letters vary in length, but often are many pages and require many hours to write. As dockets are updated, review responses to comments and identify next opportunities.

Activity	Purpose	Level of Effort	
Advisory	Serve on EPA, DPR, and Water Board policy and scientific advisory committees	Provide information and identify data needs and collaboration opportunities toward development of constructive approaches for managing pesticides.	Two to six meetings per committee per year. The PSC is currently represented on both EPA's and DPR's external advisory committees and has sporadic representation on water board panels related to pesticides.
Educational	Presentations to EPA, DPR, Water Board, CASQA members, pesticide manufacturers, water quality researchers, and other collaborators	Educate EPA, DPR, Water Board, and CASQA member staff about the problems with existing pesticide regulatory process, encourage change, report on achievements. Influence research and monitoring programs. Inform development of new pesticides by manufacturers and selection of pesticides by professional users.	As many as a dozen opportunities to present at water quality, pesticides and chemical conferences nationally. Additional 8-10 opportunities per year for state and regional events. Preparation of presentations and coordination with water quality community can take as much as 40 hours per opportunity.
	Developing and delivering public testimony	Educate Water Board members about the problems with existing pesticide regulatory process, encourage change, report on achievements.	Two to three times per year. Preparation and coordination can take as much as 40 hours per opportunity.
Monitoring	Track urban runoff monitoring and pesticide-related research	Encourage coordination with Water Board/MS4 data needs and priorities; stimulate academic, government, or private development of analytical and toxicity identification methods to address anticipated MS4 needs; share information to improve decisions.	About 10 important publications per month and a dozen meetings per year.
	Data analysis of DPR/SWAMP/USGS/MS4 monitoring, pesticide use data, and information from scientific literature	Summarize data to educate CASQA members and water quality community, Water Boards, DPR, and EPA.	Detailed analysis is infrequent because finding, compiling, and analyzing data requires very high level of effort and funding. CASQA undertook a detailed monitoring summary in 2013. Report is available at <a href="http://www.casqa.org">www.casqa.org</a> .

In addition to efforts listed in Table 4, the PSC has identified the following additional, *yet-to-be funded* activities that would assist the water quality community in achieving CASQA goals (Section 4):

💧 Education and Advisory

- Periodically conduct trainings, including two that have been specifically requested by pesticide regulators:
  - Training for DPR's surface water program to increase understanding of pathways connecting pesticide applications to urban runoff and provide realistic expectations regarding urban runoff BMPs. Similar request from OPP.
  - Set up a briefing for OPP on swimming pool discharges.
- Expand participation in scientific advisory panels and in scientific peer reviews to improve the quality and focus of scientific information that forms the basis of regulatory decisions.
- Conduct more person-to-person meetings with EPA OPP staff to improve their knowledge and engagement in addressing pesticide impacts on urban water bodies.
- Provide urban runoff modeling expertise to work with EPA to establish better modeling of pesticides in urban runoff.
- Build relationships with EPA Region 9's Water Division; encourage them to become a UP3 partner.
- Expand education of Water Board staff and Board members at the state level and the Los Angeles, San Diego, and Santa Ana regions.
- Deliver presentations targeting pesticide regulators, manufacturers, and user audiences at their conferences and agency scientific meetings.

💧 Data Gathering and Analysis

- Regularly analyze and report on pesticide sales and use information for priority pesticides (pyrethroids, fipronil, and indoxacarb) to identify use levels and trends.
- Periodically review usage, toxicity, environmental fate, and monitoring data to update priority pesticides list.
- Improve capacity to assemble scientific information for making a stronger "case" to pesticide regulators.
- Develop capacity to provide EPA with appropriate documentation (e.g., costs of pesticide water pollution) to support regulatory decisions that protect water quality.

💧 Communications and Partnership Coordination

- Renew communications with professional applicators.
- Improve UP3 coordination.
- Re-launch UP3 Partnership website as a resource for regulators and pesticide users
- Restart Urban Pesticides Committee meetings to better coordinate activities and improve communication among the regulatory, environmental, pesticide manufacturer, and pesticide user communities.



## 3.2 FY 2015 Activities

In the coming year, depending on funding, CASQA will undertake numerous activities to both address near-term pesticide concerns and seek long-term regulatory change.

CASQA's current priority activities are as follows:

- (1) Address near-term regulatory concerns:
  - Obtain DPR action on fipronil water pollution
  - Ensure DPR enforces mitigation measures for pyrethroids and adopts additional measures if necessary
  - Ensure the state conducts surveillance monitoring to evaluate pyrethroids (and fipronil) mitigation effectiveness
  - Encourage EPA to develop capacity to implement pyrethroids and fipronil mitigation measures, in case necessary mitigation cannot be implemented entirely by DPR
  
- (2) Seek long-term changes in the pesticide regulatory structure
  - Seek procedure changes such that EPA and DPR avoid approving new pesticides that cause urban water pollutions
  - Encourage EPA to develop robust urban surface water risk assessment procedures for pesticide reviews
  - Work toward obtaining a statewide management approach for pesticides that is adopted by the State Water Board, and formally recognizes the need to rely on DPR and OPP authority as the primary means to prevent and mitigate water quality impacts by pesticides.
  - Seek restructuring of California's urban surface water pesticides monitoring to increase its effectiveness

Table 5 presents upcoming regulatory action items that are likely to proceed in the coming year. Many items will require letters as well as other communications with EPA, DPR, and the Water Boards. CASQA will continue to coordinate with other water quality organizations through the UP3 Partnership to take advantage of efficiencies and ensure that the water quality community has a consistent message.

**Table 5. Action Items Anticipated to be Taken Up by CASQA and UP3 Partnership in 2014-2015**

Action Items
<b>EPA Pesticide Registration Review</b>
<p>Upcoming Registration Review Decisions</p> <ul style="list-style-type: none"> <li>• Pyrethroids: Allethrins, Metofluthrin (termination without risk assessment)</li> <li>• Organophosphates: Malathion</li> </ul>
<p>Upcoming Environmental Risk Assessments of Interest:</p> <ul style="list-style-type: none"> <li>• Pyrethroids: Allethrins, Cyfluthrins, Deltamethrin, Esfenvalerate, Etofenprox</li> <li>• Organophosphates: Malathion, Chlorpyrifos, Diazinon</li> <li>• Others: Zinc pesticides; copper salts; silver and compounds, Glyphosate, Simazine</li> </ul>
<p>Upcoming Work Plans of Potential Interest:</p> <ul style="list-style-type: none"> <li>• Diuron, MCPP, Triclopyr, Oxadiazon, Oxyfluorfen, Mancozeb, Chromate Arsenicals, Creosote, Pentachlorophenol, Tributyltin, Ziram, Zinc pyriithione</li> </ul>
<b>EPA Registration Applications</b>
<p>Applications of interest:</p> <ul style="list-style-type: none"> <li>• Pesticides proposed for urban, outdoor use with direct pathway for discharge to storm drains</li> <li>• Pesticides with high aquatic toxicity</li> <li>• Pesticides containing priority pollutants</li> </ul> <p>Watch for Decisions:</p> <ul style="list-style-type: none"> <li>• Momfluorothrin</li> <li>• Silver-zinc marine antifouling paint</li> </ul>
<b>Other EPA Action Items</b>
<ul style="list-style-type: none"> <li>• U.S. EPA OPP/OW Common Effects Assessment Methodology – continue to press for completion and implementation; request that project address time periods and other discrepancies.</li> <li>• U.S. EPA petition decisions – nanosilver registration, nanocopper regulation, request to ban triclosan.</li> <li>• U.S. EPA research and development activities to support pesticides management, such as urban runoff model development, nanomaterials case studies, and scientific data acceptance policies– seek to make urban runoff’s needs a priority; share information to inform decisions.</li> <li>• U.S. EPA Pesticide Inert Ingredient Disclosure rulemaking.</li> <li>• Endangered species consultations/litigation (review/engage only if could significantly affect urban pesticide use or could help with permit compliance in key geographic areas).</li> <li>• Additional CASQA opportunities:             <ul style="list-style-type: none"> <li>○ Educate OPP management and scientists about gaps in OPP scientific and regulatory procedures for urban runoff that prevent effective, proactive evaluation of pesticide risks.</li> <li>○ Continue to engage EPA Region 9 re CASQA’s preferred approach for pesticide monitoring and management in permits and TMDLs.</li> </ul> </li> </ul>

## Action Items

### DPR Registration Applications

Until procedures are modified to provide for surface water quality reviews of all priority pesticides from the urban runoff perspective, screen DPR product registration applications and proposed decisions and comment on activities that pose high risks or provide compelling examples of possible procedural deficiencies. Products of interest:

- Products proposed for urban, outdoor use with direct pathway for discharge to storm drains
- Products with high aquatic toxicity
- Products containing priority pesticides (Table 1)

Watch for Decisions:

- Cyantraniliprole (highly toxic pyrethroid alternative)
- Chlorantraniliprole (highly toxic pyrethroid alternative)
- Copper sulfate antimicrobial
- Novaluron (first outdoor structural use of toxic pyrethroid alternative)
- Fipronil foam product
- PathShield Antimicrobial Filter Media (for use in storm drains)

### Other DPR-related Action Items

- Pyrethroids – continue to track activities, review scientific studies, and encourage DPR to take additional actions if necessary for water quality protection.
- Pyrethroids regulations – track implementation and obtain regular updates on effectiveness monitoring.
- Bifenthrin professional products labels – ensure that product labels are revised and corrected.
- Fipronil – continue to work with DPR on actions to protect water quality.
- Urban runoff model development – track short-term and long-term efforts and share information to improve approach.
- Urban runoff monitoring and research – continue to encourage coordination with Water Board/MS4 data needs and priorities; encourage monitoring prioritization to better capture pesticides and degradates of interest; share information to improve decisions.
- Methodology for Evaluating Pesticide Registration Applications for Surface Water Protection – share information to encourage DPR to address antimicrobials, swimming pool additives and to address degradates in review methods.

### Water Boards Action Items

- Water Board policy for addressing pesticides in NPDES permits – continue to encourage development of a Statewide Coordinated Pesticides Approach; participate in policy development.
- Central Valley Water Board Pyrethroids Water and Sediment Criteria
- Central Valley Water Board Basin Plan Amendments: pyrethroids and diuron
- State Water Board Policy for Toxicity Assessment and Control – track pesticide monitoring, toxicity testing & other pesticide-related provisions in NPDES Permits.
- Monitoring requirements for Phase II permittees – continue participating in development.
- Pesticide/toxicity 303(d) listings and TMDLs – continue tracking.

## Action Items

### Other California Agency Action Items

- California Department of Food & Agriculture Draft Program EIR on invasive species control – Are pesticide application programs consistent with Water Board expectations in urban areas?
- Adoption of Structural Pest Control Board regulations – increase licensee continuing education requirements for IPM and water quality protection.

In addition to the action items in Table 5, CASQA will also continue the following activities in FY 2015:

- Education and information sharing with CASQA and Partner<sup>18</sup> research and monitoring scientists about priority needs, integration, and data interpretation
- Track major relevant scientific studies; review relevant scientific literature, monitoring data, and government reports; and maintain database of key references.
- Serve on EPA, DPR, and Water Board policy and scientific advisory panels.
- Peer review EPA, DPR, and Partner work plans and reports.
- Participate in and give presentations at meetings or conferences with high participation from pesticide regulatory, research, and manufacturing communities – 2014-15 priorities include American Chemical Society (San Francisco CA) and SETAC (Vancouver BC),
- Educate and inform water quality community through presentations at CASQA and other California water quality meetings or conferences
- Update pesticide priority lists based on new scientific and regulatory information.
- Prepare monthly action plans
- Publish annual report

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<sup>18</sup> Partners: USGS NACWA (national monitoring); other states; Water Board SWAMP (Statewide and 9 regions); DPR; POTWs; urban runoff programs; university researchers; pesticide manufacturers.

## Section 4: Envisioning the Future

An effective regulatory system would identify whether urban uses of a pesticide pose a threat to water quality and would restrict or disallow those uses proactively so that water quality impacts are avoided. Such a system would be far more cost-effective than the current system in which mitigation of pesticide impacts is reactively attempted through Clean Water Act (CWA) mechanisms, such as TMDLs, that impose requirements on urban stormwater agencies and wastewater facilities.

CASQA's objective in engaging in pesticide-related regulatory activities is to ultimately protect water quality by eliminating problems stemming from urban pesticide use. The CASQA Pesticides Subcommittee envisions a future when the following goals have been attained:

- **Goal 1: EPA and DPR will conduct effective, proactive evaluations of pesticide risks.** EPA and DPR registration and registration reviews will include effective evaluations for the potential of all pesticide active ingredients and formulated products to impact urban waterways. Staff will understand all urban use patterns, and models will accurately reflect urban use patterns, the impervious nature of the urban environment, drainage systems and pathways to receiving waters. Data required of manufacturers will support proactive evaluations. Cumulative risk assessments will be conducted, especially for pesticides with similar modes of action.

**Figure 4. CASQA envisions an effective regulatory system to identify whether urban uses of a pesticide pose a threat to water quality and then restrict or disallow those uses proactively so that water quality impacts are avoided.**





- 💧 ***Goal 2: Pesticide regulators and water quality regulators will work in coordination to protect water quality.*** The Water Boards, DPR, EPA’s Office of Water (OW) and OPP will have a consistent definition of what comprises a water quality problem. EPA’s OW and OPP will complete “harmonization” of methodologies and approaches to protect aquatic life.
- 💧 ***Goal 3: Pesticide regulations and statutes will be used to solve pesticide-related water quality impairments resulting*** from the registered uses of pesticides. Rather than look to the Clean Water Act, the EPA and Water Boards will work with DPR and the EPA’s Office of Pesticide Programs to manage problem pesticides without the use of the costly, slow and burdensome TMDL process.
- 💧 ***Goal 4: Pesticide monitoring will be coordinated at the state level to support rapid response to emerging pesticide problems in urban waterways.*** DPR and the Water Boards will coordinate statewide monitoring to identify emerging pesticide problems in urban waterways before they become widespread and severe. Urban-specific, use-specific mitigation measures will be used to address water quality problems.

***CASQA looks forward to working with our Partners to continue to forge a path towards this vision.***

## Appendix

**Table 6. Highlights of Recent Regulatory Achievements by CASQA as part of the UP3 Partnership**

Achievements Impacting High-Priority Urban Pesticides	Significance
<p>In 2014, DPR initiated an effort to address <b>fipronil</b> water pollution in California urban areas <i>in direct response to a joint CASQA and Water Board request</i> based on CASQA's 2013 compilation of fipronil monitoring data.<sup>19</sup></p>	<p><i>DPR's timely action to reduce fipronil concentrations in urban runoff could avoid many future urban TMDLs. Fipronil is a highly toxic pyrethroid alternative that is used only in urban areas. Fipronil monitoring data is likely to provide the basis for multiple fipronil 303(d) listings in future cycles.</i></p>
<p>In 2014, EPA modified its work plan for review of the <b>indoxacarb</b> to include urban uses <i>in direct response to CASQA and Water Board comments</i>. CASQA and Partners called these uses to EPA's attention and made a strong and well-documented case for detailed review of water quality impacts.</p>	<p><i>Ensured that EPA's upcoming review will not omit urban uses of a highly toxic pyrethroid alternative. The modified work plan will also substantially expand data requirements to obtain environmental fate and aquatic toxicity data for indoxacarb and its stable, toxic degradates; and require development and validation of chemical analysis methods.</i></p>
<p>In 2014, DPR initiated development of procedure improvements to address scientific gaps in DPR's scientific reviews of new pesticide registration applications.</p>	<p><i>When completed, will provide more thorough reviews of pesticides that may impact urban water quality and better prevent water pollution. Scientific gaps in DPR's procedures (related to building perimeter sprays and toxic degradates) caused DPR in 2014 to propose approval of CASQA priority, cyantraniliprole (see Table 2).</i></p>
<p>In July 2012, DPR issued new Surface Water Protection Regulations for 17 <b>pyrethroids</b> limiting how and where pyrethroids can be used by pesticide control operators.</p>	<p><i>Estimated to reduce pyrethroid toxicity in surface water by 80-90%. Effective pest management has not been adversely impacted by this change.</i></p>
<p>In 2011, DPR agreed with manufacturers to phase in new labels for <b>bifenthrin</b> to prohibit broadcast applications to horizontal impervious surfaces and certain building walls (see Figure 4).</p>	<p><i>Estimated to reduce outdoor bifenthrin use &gt;90% in combination with new Surface Water Protection Regulations (see above).</i></p>
<p>Between 2010 and 2012, in response to CASQA and Water Board comments, EPA developed new conceptual models and scientific approaches to address pesticides in urban runoff and included these in workplans for upcoming Registration Reviews of the <b>pyrethroids</b> and <b>fipronil</b>. Will include impervious surface applications and urban drainage systems in modeling and will require additional aquatic toxicity data (e.g., data for <i>Hyalella azteca</i> were required for pyrethroids)</p>	<p><i>EPA's upcoming reviews will not omit urban uses of pyrethroids and fipronil. Including urban uses provides the ability for EPA to implement appropriate mitigation measures to protect water quality. While the new approaches are available for other pesticides, EPA does not consistently apply them (see discussion above on EPA review of indoxacarb).</i></p>

<sup>19</sup> Ruby, Armand. 2013. Review of Pyrethroid, Fipronil and Toxicity Monitoring from California Urban Watersheds. Available at <https://www.casqa.org/LinkClick.aspx?fileticket=%02btwBGMxunc%3d&tabid=194&mid=995>.

Achievements in Procedures, Modeling, and Monitoring	Significance
<p>In recent years, DPR has institutionalized an <b>urban monitoring</b> program initiated as a pilot in the late 2000s <i>at the urging of CASQA and UP3</i>. In 2013-2014, DPR and the Water Boards' Surface Water Ambient Monitoring Program expanded their partnership to monitor sediment toxicity and high priority urban pesticides (currently <b>pyrethroids</b> and <b>fipronil</b>) in representative California urban watersheds and began exploring collaboration on other high priority pesticides.</p>	<p><i>The Water Board/DPR partnership coordinates the state's toxicity and pesticides monitoring for the first time and expands it across all California regions. DPR's monitoring program provides the specific types of data it needs to evaluate water quality and provide the basis for its management decisions.</i></p>
<p>In April 2013, EPA formally updated <b>data requirements</b> for certain <b>antimicrobials</b> in response to requests by CASQA and other water quality agencies to ensure data availability for urban runoff evaluations.</p>	<p><i>EPA acknowledged that wood preservatives and antifoulants have pathways to stormwater and is now requiring additional environmental toxicity and fate data from manufacturers. While it did not address other categories of pesticides in urban runoff, EPA has progressively improved its data requirements on a case-by-case basis since CASQA's initial engagement in the early 2000s.</i></p>
<p><i>As a result of requests by CASQA</i> and other water quality agencies for better <b>urban runoff modeling</b>, DPR has devoted significant resources toward urban runoff model development and provided research funding to U.C. Davis and UC Riverside. <b>(See Section 2.4 for additional details.)</b></p>	<p><i>DPR's leadership is expected to lead to improved understanding of fate and transport of outdoor urban pesticide treatments on impervious surfaces. Environmental fate and transport models have not adequately represented urban runoff. An improved model can help identify risk of pesticide pollution so it may be mitigated before registration.</i></p>