Management Approaches for Reducing Triclosan Releases: Status of Initiatives in the South San Francisco Bay Area

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Problem

Triclosan has been considered an emerging contaminant in the Bay Area since 2001. Has the "unified regional approach" recommended in the 2006 White Paper prepared by the Emerging Contaminants Workgroup of the Santa Clara Basin Watershed Management Initiative been implemented? How is California doing compared to other states and international activities? In 2013, the San Francisco Estuary Institute placed triclosan to Tier 2—Low Concern.

This presentation describes the current status of local to international management tactics that are effective at reducing triclosan levels. 2010 data from sediment cores in four urbanized estuaries outside of California suggest that sediment concentrations were the highest in the 1960s and 1970s, but may be rising again (Cantwell et al 2010, as cited in SFEI Triclocan Fact Sheet, 2011).

Management strategies include regulation, reformulation, legislative action, advocacy groups and public awareness. What needs to occur so that triclosan can be considered a long-term success story? What steps can you take to help this happen?

Background

Triclosan

Treatment effluent and stormwater runoff are the primary migration pathways for triclosan to the environment.

In a 1999-2000 U.S. Geological study, triclosan was detected in 58% of 85 U.S. waterways. It has been also been detected in 97% human breast milk samples, 47% blood plasma and 75% of urine samples (http://www.ewg.org).

Laboratory studies suggest that triclosan can act as an endocrine disrupter in fish and mammals. In addition, it has breakdown products that may have higher toxicity (SFEI, 2013).

Triclosan is regulated by both the Food and Drug Administration and the USEPA.

There are no federal drinking water standards for Triclosan. Minnesota is the only state with a drinking water guideline of 50 parts per billion that was developed in 2011.

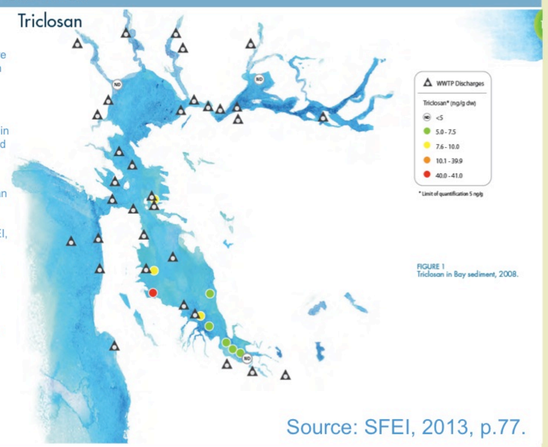


FIGURE 1
Triclosan in Bay sediment, 2008.

Source: SFEI, 2013, p.77.

Triclosan Facts and Timeline

What Is It?

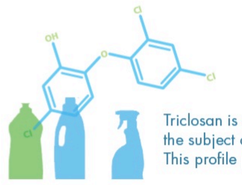
- Synthetic chlorinated chemical that is a broad-spectrum antimicrobial agent.
- Kills or inhibits the growth of microorganisms, including bacteria and fungi.
- Structurally similar to triclocarban, another popular antimicrobial that is found in bar soaps and is also a concern in aquatic environments.

What Is It Used For?

- Antimicrobial used since the early 1960s in thousands of consumer and industrial products, including antibacterial liquid hand soaps (0.1-0.3% by weight), body washes, cosmetics, mouthwash, toothpaste, detergents, deodorants, and other products including furniture, cutting boards, sports equipment, floors, and carpets.
- Microban®, a slow release product that sometimes contains triclosan, is also incorporated into plastics used in children's toys, kitchen utensils, and other consumer and industrial products, and Biofresh®, another triclosan product, is embedded in some clothing.
- Estimated annual use of more than 300,000 kg/yr in the US (Halden and Paull 2005).
- The American Medical Association has not endorsed the necessity or efficacy of triclosan and other antibacterial agents in personal care products (WMI 2006). Physicians indicate that the best germ fighting measure continues to be the actual act of hand washing with regular soap, or for extra assurance, alcohol-based hand sanitizers.
- According to the US Food and Drug Administration, the only evidence of effectiveness is in toothpaste in preventing gingivitis (http://www.fda.gov/forconsumers/consumerupdates/ucm205999.htm).

How Is It Getting Into the Bay?

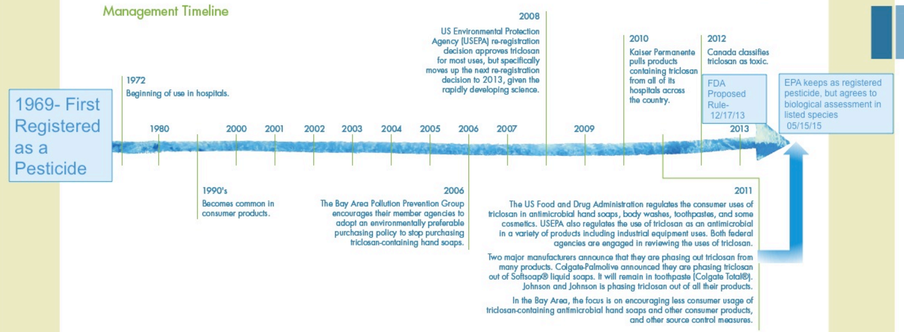
- Municipal wastewater treatment plant effluent is probably the major pathway to the Bay, although more information is needed on other potential pathways.
  - Over 95% of triclosan uses are in consumer products that are disposed of in residential drains, resulting in transport to municipal wastewater treatment plants.
  - Removal efficiencies in treatment plants typically range from 60% to >99.5%, depending on the type of treatment used.
  - Given the incomplete removal in treatment plants, triclosan is commonly detected in treatment plant effluent.
  - Concentrations in effluent from a Bay Area treatment plant in 2006 (ranging from <500 to 900 ng/L) (Jackson and Sutton 2008) were comparable to effluent concentrations observed in other studies.
  - Average concentrations in sewage sludge from two Bay Area treatment plants in 2008 (15-20 ppm) were similar to the nationwide average of 16 ppm (USEPA 2009 Targeted National Sewage Sludge Survey).
- Urban stormwater, which flows directly into the Bay untreated, is another potential pathway due to the use of triclosan-containing products for activities such as exterior cleaning and car washing.



Triclosan is a personal care product ingredient of particular interest that was the subject of a RMP fact sheet (www.sfei.org/news_items/factsheet-triclosan). This profile presents an update of the information in the fact sheet.

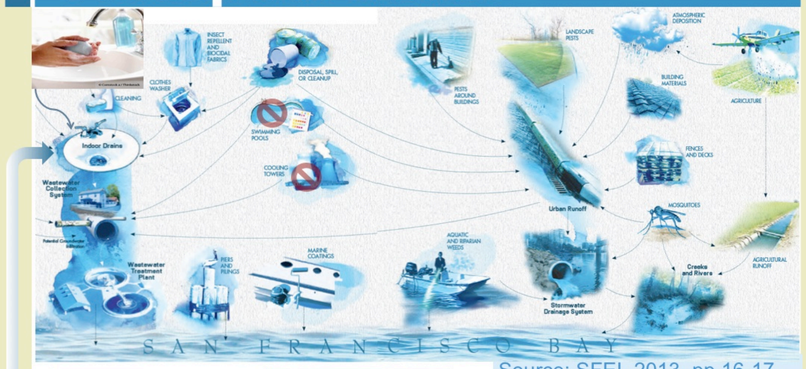
Source: SFEI, 2013, p.75.

Management Timeline



Source: SFEI, 2013, p.78.

Conceptual Model



Source: SFEI, 2013, pp 16-17.

A Few Products

And many others at: http://hpd.nlm.nih.gov/cgi-bin/household/brands?tbl=chem&id=75&query=triclosan&searchas=TblChemicals

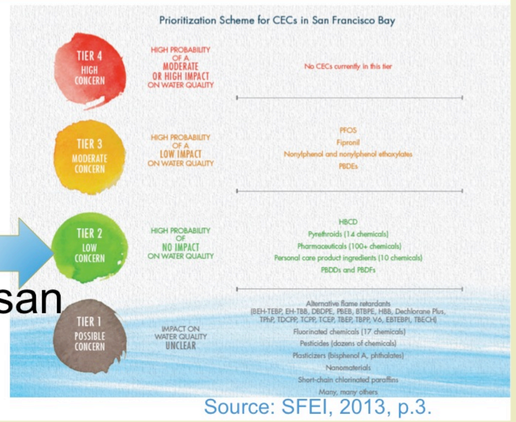
What can you do?

- ☛Don't use antibacterial hand soaps or washes
- ☛Don't buy or use other products with triclosan or triclocarban (list is large: certain window coverings, plastics, toys, shoes, athletic wear, bedding, paint, towels, cutting boards, hoses, etc.)
- ☛Support and develop corporate purchasing policies (e.g. Kaiser) to ban buying products with triclosan.
- ☛Support voluntary phase-out plans by Procter & Gamble and Johnson & Johnson
- ☛Tell your friends and family to do the same!

2015 RMP* Classification

"New contaminants found in Bay mussels include compounds likely derived from the antibacterial ingredient triclosan"SFEI Broad Scan Analysis SFEI RMP Contribution No. 748 May 2015

Triclosan



Source: SFEI, 2013, p.3.

Current Strategy: Prevention

- Source control via public awareness and voluntary elimination is the primary management strategy.
- Recommendations from 2006 largely implemented. The following entities no longer purchase triclosan-containing soaps: Palo Alto, San Jose, EBMUD, Central Contra Costa Sanitation District and many more (Karin North, City of Palo Alto, February 3, 2014)
- Remaining data gaps to be addressed using adaptive management approach.
- Decreased loading is suggested from widespread addition of activated sludge wastewater treatment (Cantwell et all 2010).
- December 17, 2013 Proposed Rule by FDA requires that companies prove that that triclosan is safe and more effective than plain soap. In addition, FDA will scrutinize for hormonal disruption and bacterial resistance.
- We have not selected regulation, compared to Minnesota and the European Union

CONCLUSION: *too early to tell if success story*

References

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USEPA Respond to Citizen Request for Triclosan Ban May 15, 2015 http://www2.epa.gov/pesticides/epa-responds-citizen-petition-ban-triclosan

US National Library of Medicine, NIH: Triclosan 2015. http://www.ncbi.nlm.nih.gov/pmc/articles/PMC4454990/ ,accessed 15 October 2015.

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*RMP=Regional Monitoring Program of the San Francisco Estuary Institute (SFEI). Classifications were originally made in 2013. The RMP is a collaborative effort between SFEI, the Regional Water Quality Control Board, and the regulated discharger community.

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