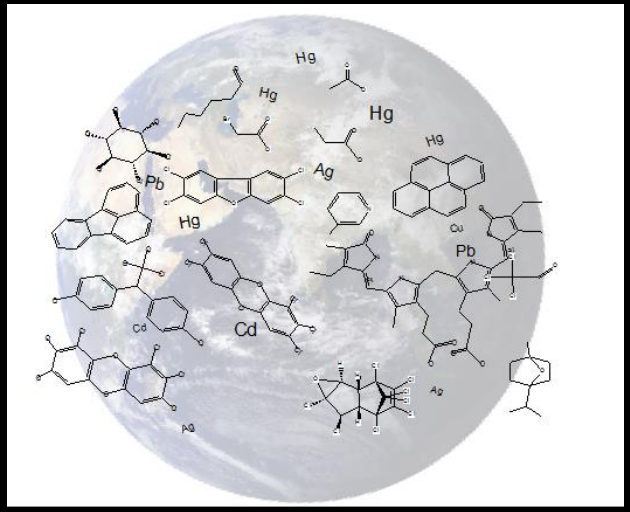
How Policy Makers And Purchasers Can Reduce The Use Of Harmful Chemicals And Prevent Regrettable Substitutions

Arlene Blum, Avery Lindeman , Terry Collins, Gretta Goldenman, Mark Miller, Miriam Diamond

A Planetary Boundary for Chemical Pollution



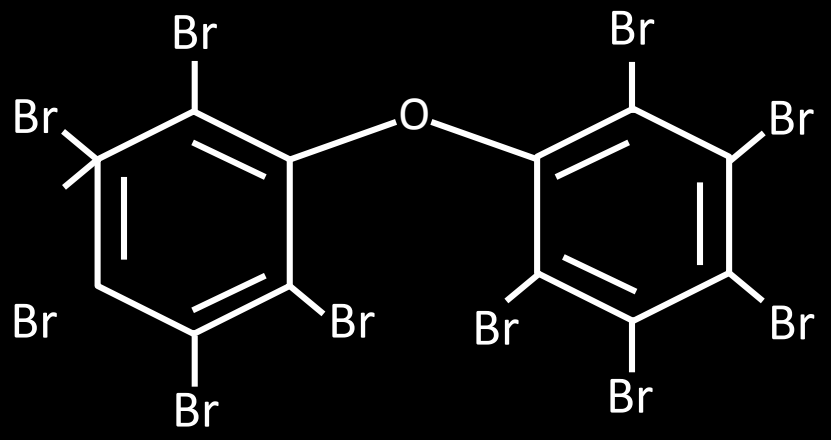
Chemical pollution is global:

- Rapidly increasing global production
- Persistence and long range transport
- Finite capacity of the earth to absorb toxics

Demands a globally coordinated response

Diamond et al, 2015, Environment International

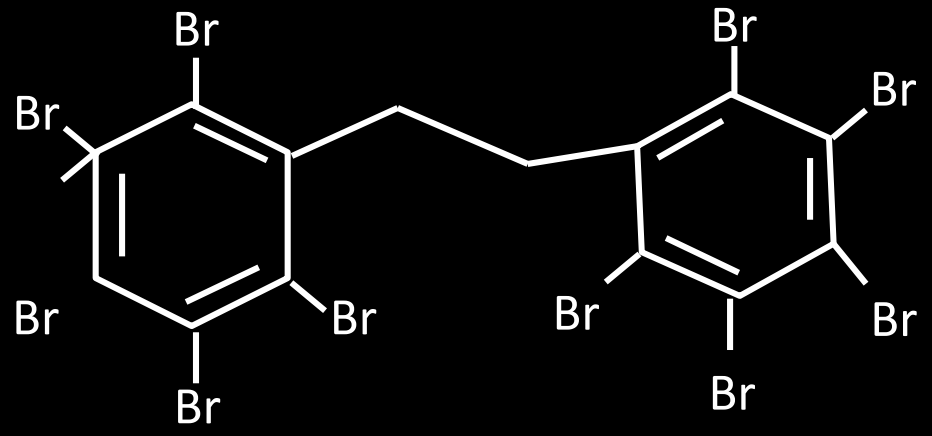
Regrettable Substitution



Decabromodiphenyl ether

Concerns:

- Persistence
- Bioaccumulation
- Toxicity

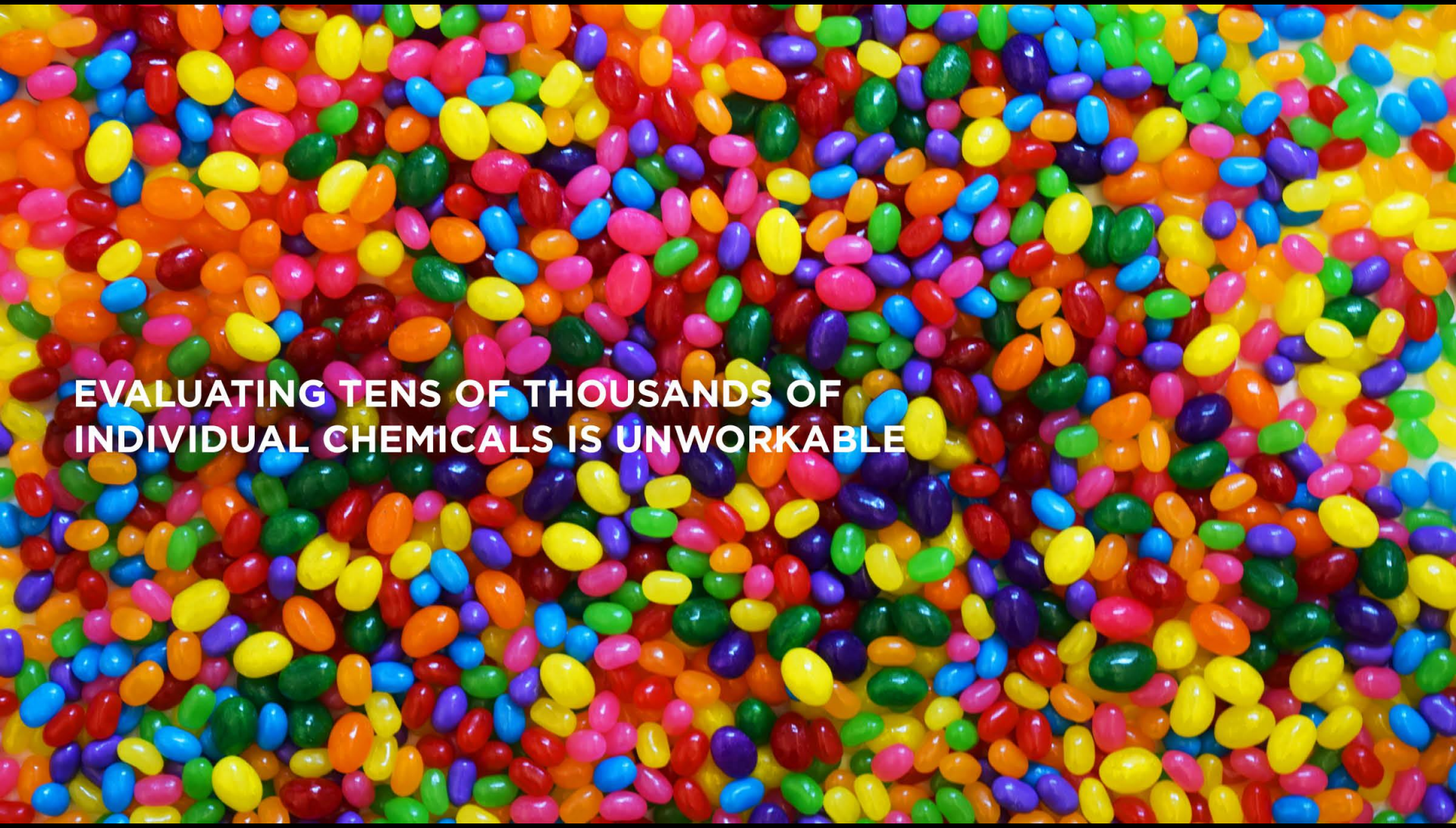


Decabromodiphenyl ethane

Concerns:

- Persistence
- Bioaccumulation
- Toxicity

One definition of insanity: "doing the same thing over and over again and expecting different results"


EVALUATING TENS OF THOUSANDS OF
INDIVIDUAL CHEMICALS IS UNWORKABLE



BUT ADDRESSING SIX GROUPS OF CHEMICALS OF CONCERN IS MANAGEABLE



The Six Classes

1. Highly fluorinated chemicals (PFASs)
   stain and water repellants
2. Chlorinated antimicrobials
   triclosan and triclocarban
3. Flame retardants
   brominated, chlorinated, phosphate
4. Bisphenols and phthalates
   phthalates, BPA, BPS, etc.
5. Organic solvents
   benzene, methylene chloride, xylene, etc.
6. Certain metals
   lead, mercury, chromium, cadmium, arsenic, etc.

Is it necessary?

Is it worth it?

Is there a safer alternative?

The Six Classes Challenge

Can the use of the Six Classes in consumer products be reduced by 50% in five years?

SixClasses.org
15-minute webinars on Six Classes containing chemicals of concern

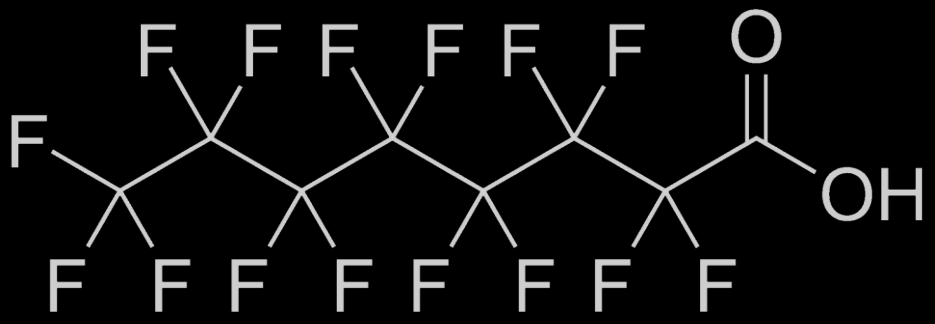
GREEN SCIENCE POLICY INSTITUTE
www.GreenSciencePolicy.org

Classes I to 3

Class 1: Highly Fluorinated Chemicals

Carbon-Fluorine bond strength:

- Leads to oil and water repellency
- Lasts for geologic time!



Adapted from slide by Dr. Jennifer Field

November 2014 Helsingør Statement on Poly & Perfluorinated Alkyl Substances

May 2015 The Madrid Statement on Highly Fluorinated Chemicals

"We call on the international community to cooperate in limiting the production and use of PFASs and in developing safer non-fluorinated alternatives."

Signed by 230 scientists from 40 countries

2015: Environmental Health Perspectives

In the news

The Opinion Pages | OP-ED COLUMNIST

The New York Times

Chemicals in Your Popcorn?

JUNE 4, 2015

Nicholas Kristof

What do a pizza box, a polar bear and you have in common?

All carry a kind of industrial toxicant called poly- and perfluoroalkyl substances, or PFASs, that do two things: They make life convenient, and they also appear to increase the risk of cancer.

These Chemicals in Pizza Boxes and Carpeting Last Forever

More than 200 scientists around the world document the threats of perfluorinated compounds and call for more government control.

By **Lindsey Konkel**, National Geographic

PUBLISHED MAY 01, 2015

NATIONAL GEOGRAPHIC

The Intercept_

THE TEFLON TOXIN

DuPont and the Chemistry of Deception

Sharon Lerner

Aug. 11 2015, 3:35 p.m.

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Home

The New York Times Magazine

The Lawyer Who Became DuPont's Worst Nightmare

Rob Bilott was a corporate defense attorney for eight years. Then he took on an environmental suit that would upend his entire career — and expose a brazen, decades-long history of chemical pollution.

By NATHANIEL RICH JAN. 6, 2016

November 2015
Highly Fluorinated Chemicals

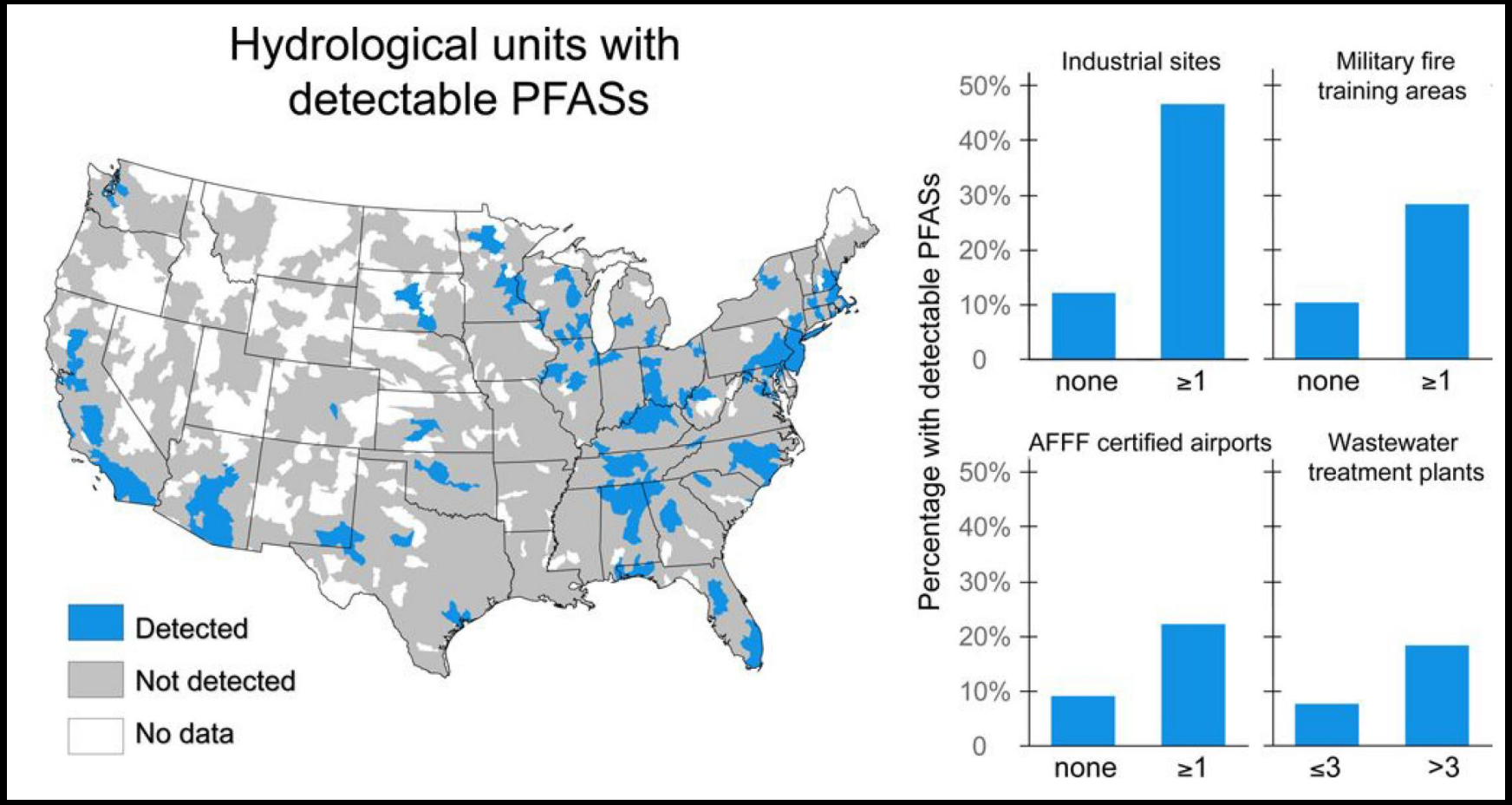
BIOMONITORING CALIFORNIA

November 2015:

Scientific Guidance Panel votes unanimously to add entire class of Highly Fluorinated Chemicals (PFASs) to priority list of chemicals.

http://biomonitoring.ca.gov/sites/default/files/downloads/SGPMeetingSummaryNovember2015.pdf

Watersheds with point sources have higher detection frequencies for PFASs



Air Force to stop using AFFF foam in training exercises

- Drinking water of six million Americans contaminated with PFAS
- AFFF firefighting foams used in training are a major contributor
- Air Force, on 19 August 2016, said:
  - "will stop using foam in training exercises"
  - "will replace all C8 foam with C6 by the end of this year"

Are short chain safer than long?

- Industry Knowledge Foundation: "…short chain fluorinated chemicals have a favorable environmental, health and safety profile, rapid bioelimination and are not bioaccumulative… they are safe for workers, consumers and the environment …"

- DuPont filed 16 reports to the EPA between April 2006 and January 2013 citing similar adverse health effects in animal studies from short chain exposure as found from long including cancer of the liver, pancreas, and testicles as well as kidney disease, liver degeneration, and uterine polyps. (Sharon Lerner, *The Intercept*)

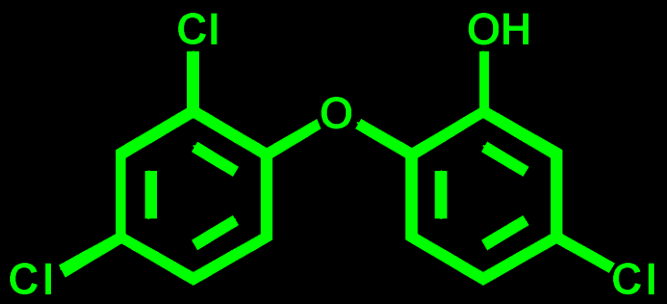
BRANDS ARE ELIMINATING HIGHLY FLUORINATED CHEMICALS

adidas	ESPRIT	Crate&Barrel	H&M
LEVI STRAUSS & CO.	MARKS & SPENCER	benetton	BURBERRY LONDON
IKEA	MANGO	PUMA	ZARA

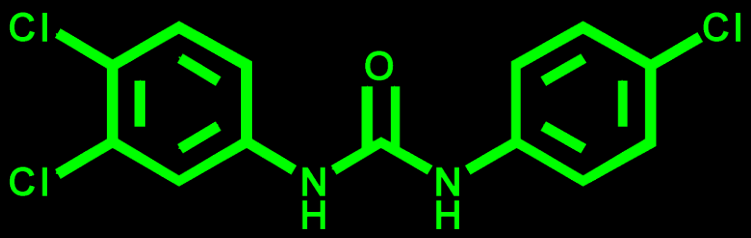
source: http://www.greenpeace.org/international/en/campaigns/detox/fashion/detox-catwalk

Class 2: Antimicrobials

Triclosan



Triclocarban

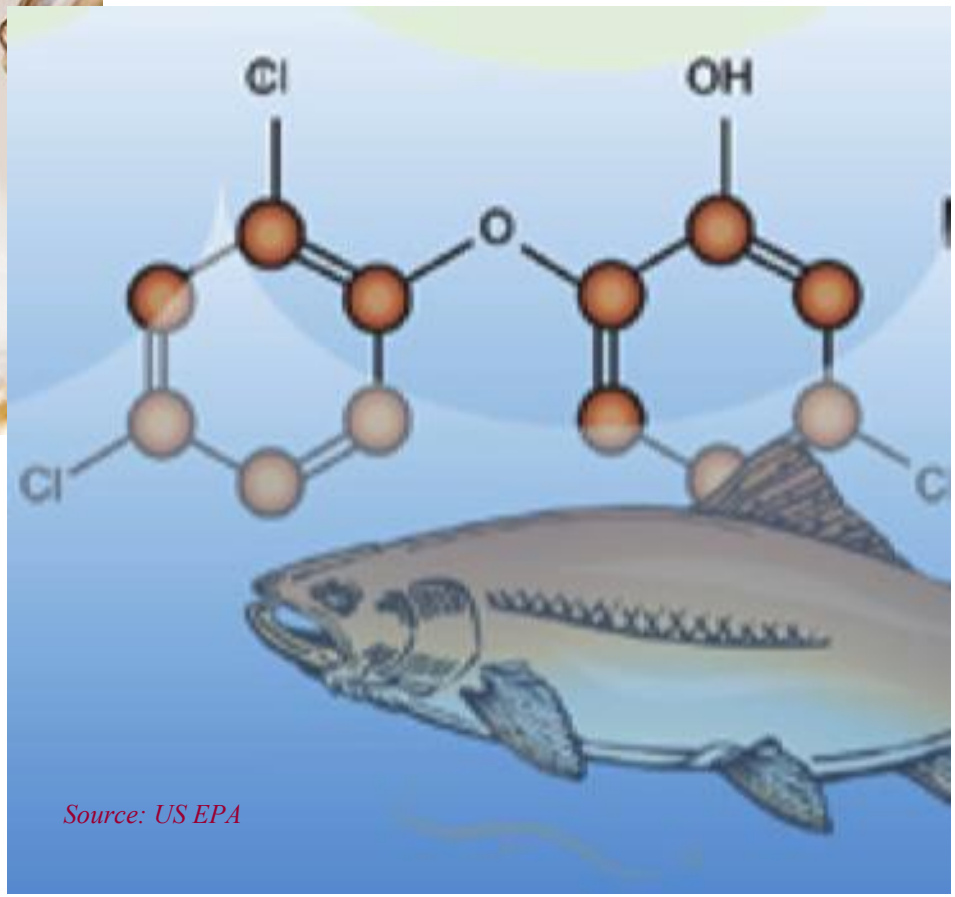


Courtesy: Dr. Gary Ginsberg

TCS/TCC in Soap Could Work, But Don't

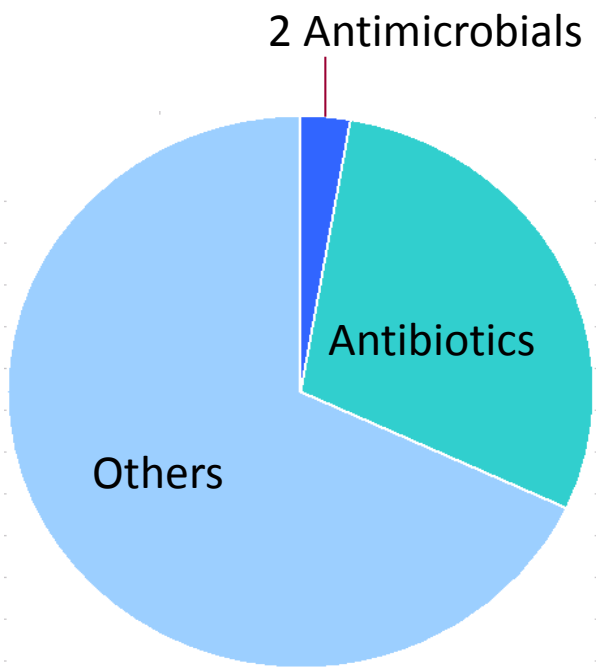
Why: Contact Time!

5 – 10 Seconds
(ineffective)

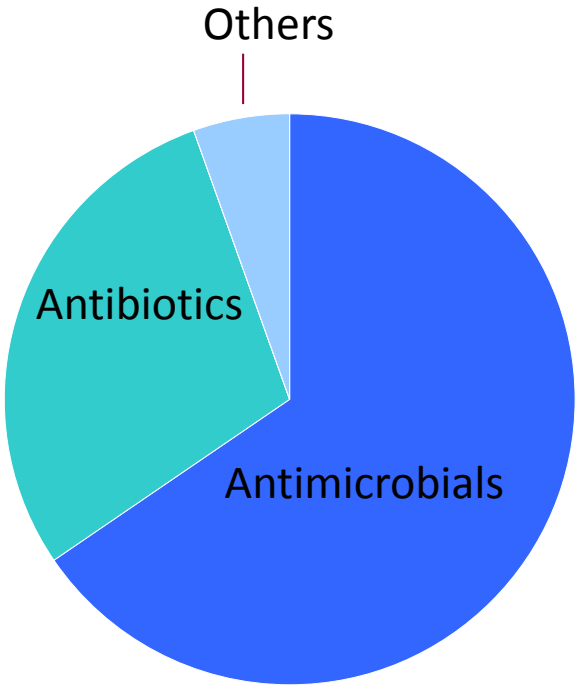


Lifetime exposure in aquatic organisms
(toxic)

Triclosan & Triclocarban: Key Sludge Pollutants



Number of Compounds, N = 72

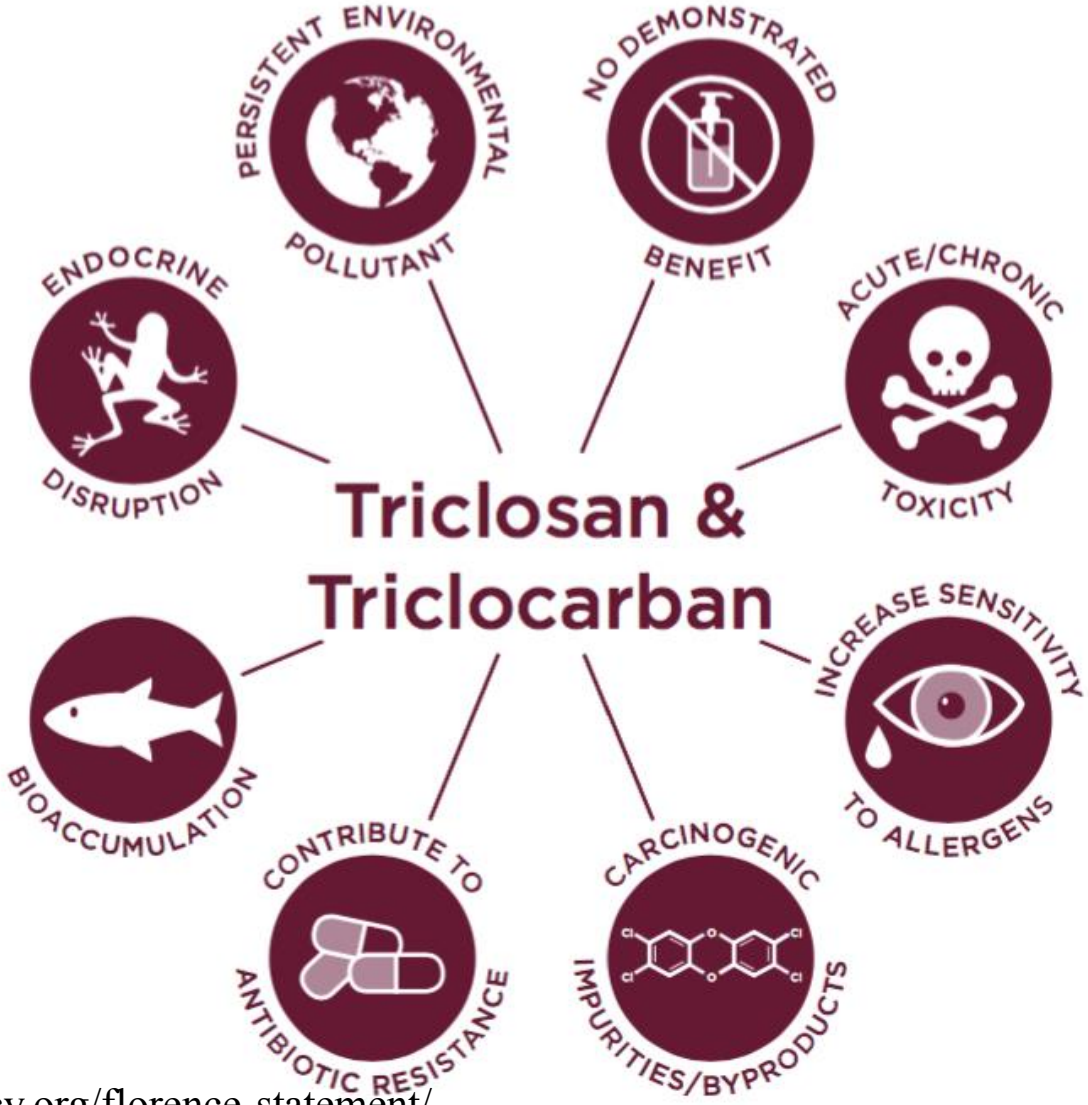


Mass of Compounds

McClellan & Halden, Water Res. 44: 626-636 (2010)

EPA Method 1694

The Florence Statement documents environmental & human health concerns



http://GreenSciencePolicy.org/florence-statement/

Adapted from: Halden, ES&T, 2014. 48(7):3603−3611

Class 3 Flame retardants

1970s Flammability Standards

- Children's sleepwear
- Furniture
- Foam plastic building insulation

Technical Bulletin 117

- Required furniture foam to withstand a small open flame for 12 seconds
- No significant fire safety benefit (fires start in exterior fabric not filling)

San Antonio Statement on Brominated and Chlorinated Flame Retardants

- Signed by over 200 scientist's from 30 countries
- Documents health and environmental harm and lack of proven fire safety benefit

2010: Environmental Health Perspectives

California Flammability Standard TB117-2013

Mandatory January 1, 2015

Flame retardants not needed, but can still be used

Product Labels Required

NOTICE

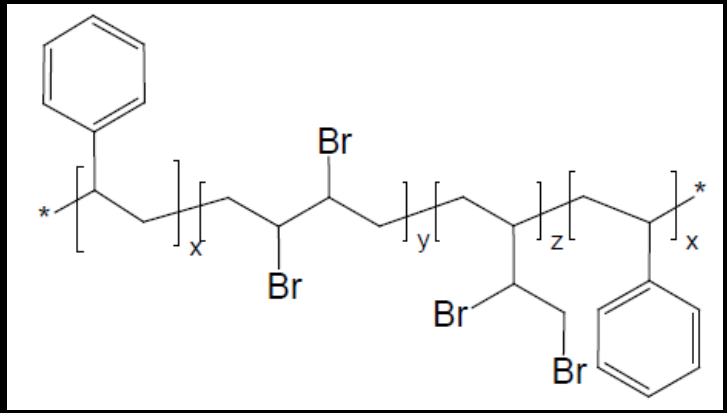
THIS ARTICLE MEETS THE FLAMMABILITY REQUIREMENTS OF CALIFORNIA BUREAU OF ELECTRONIC AND APPLIANCE REPAIR, HOME FURNISHINGS AND THERMAL INSULATION TECHNICAL BULLETIN 117-2013. CARE SHOULD BE EXERCISED NEAR OPEN FLAME OR WITH BURNING CIGARETTES.

The upholstery materials in this product:
____contain added flame retardant chemicals
__X__contain NO added flame retardant chemicals

The State of California has updated the flammability standard and determined the fire safety requirements for this product can be met without adding flame retardant chemicals. The State has identified many flame retardant chemicals as being known to, or strongly suspected of, adversely impacting human health or development.

www.bearhfti.ca.gov/about_us/sb_1019_faq.pdf

PolyFR is the Replacement for HBCD



Brominated butadiene styrene copolymer

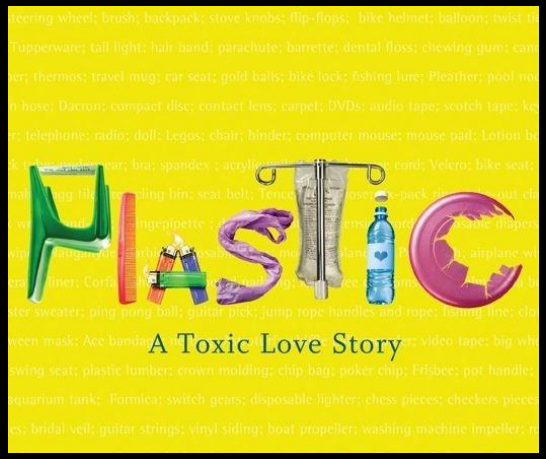
	“Emerald Innovation 3000”	“GreenCrest”	“FR-122P”
2014	10,000 tons/ year	Began production	10,000 tons/ year

U.S. EPA, U.S. OSHA, Chemical Watch

Class 4: Bisphenols and Phthalates

Uses:

- Bisphenols: plastics,
- cash register receipts, adhesives, can linings



http://www.susanfreinkel.com/books_Plastic.html

- Phthalates: plasticizers, lubricants, solvents, emulsifiers, fragrances

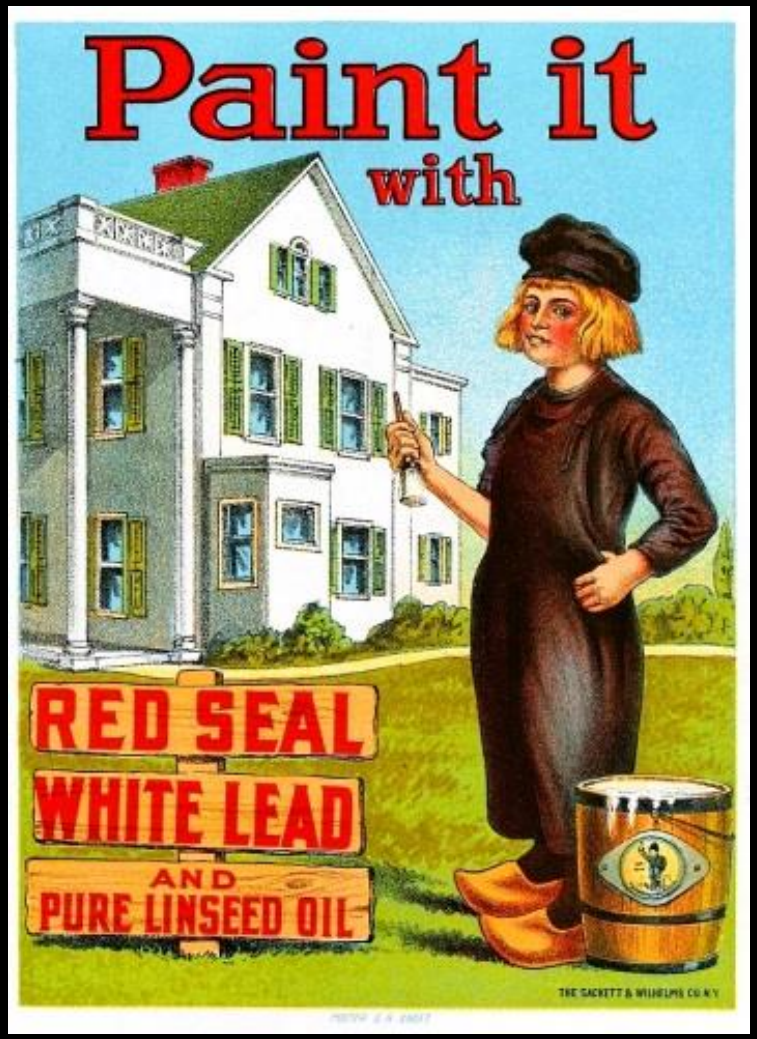
Courtesy: Dr. Miriam Diamond

Class 5: Organic Solvents
(aliphatic, aromatic, halogenated, oxygenated)

- Hydrocarbon solvents
  - Aliphatic organic solvents (petroleum-based)
  - Aromatic organic solvents (toluene, xylene, benzene)
- Chlorinated solvents
  - E.g., Methylene chloride, perc, TCE
- Oxygenated solvents
  - Acetone, glycol ethers, alcohols

Courtesy: Dr. Liz Harriman

Class 6: Certain Metals
(arsenic, cadmium, chromium, lead, mercury etc.)



Courtesy: Dr. Graham Peaslee

The Six Classes Challenge

Can the use of the Six Classes in consumer products be reduced by 50% in five years?

"Tackling Toxics" in *Science*

Scientists can:

- Develop safer chemistries
- Evaluate impacts across lifecycle
- Translate research to catalyze action among users and regulators
- Contribute to policy recommendations
- Collaborate on scientific consensus statements

Purchasers can ask:

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The Florence Statement on Triclosan and Triclocarban

- Consensus statement
- Documents health and environmental harm and lack of proven benefit

To Sign, please visit our table outside the Exhibit Hall or go to GreenSciencePolicy.org/Florence-Statement


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Anna Soehl
Gretta Goldenman

By reducing use of Six Classes

We can have a healthier world.

For more information
Google: Green Science Policy
www.greensciencepolicy.org