WELCOME

United States Contributions to Global Ocean Plastic Waste Meeting 2

For Zoom participants, send questions in Q&A feature.
For Zoom & livestream participants,
email questions to koskvig@nas.edu

Committee Members

Margaret Spring
Mary Donohue
Michelle Gierach
Jenna Jambeck
Hauke Kite-Powell
Kara Lavender Law
Jay Lund
Eben Schwartz
Rashid Sumaila

AGENDA

12:00 pm	**Welcome and overview of the day** Margaret Spring, Committee Chair
12:10 pm	**Overview of US Law Governing Solid and Water Waste Management** Scott Fulton, Environmental Law Institute Mary Ellen Ternes, Earth & Water Law, LLC
1:10 pm	*20 minute break*
1:30 pm	**Current State of Plastics Waste Management System & Infrastructure** David Biderman, Solid Waste Association of North America (SWANA)
2:10 pm	**Plastics in Stormwater and Wastewater Management** Jonathan Bishop, CA State Water Resources Control Board
2:50pm	*Adjourn open session*

BREAK

Please return at 1:30 pm EST / 10:30 am PST

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Overview of United States Law Governing Solid and Water Waste Management

December 7, 2020

Part 1: Existing U.S. Law

Scott Fulton, President

Environmental Law Institute

Former EPA General Counsel

Federal Environmental Laws in the U.S. The Backdrop

- Operate within a three-branch system of government
  - Congress establishes law through legislation (statutory law)
  - Executive implements law
  - Courts guarantee law
- Despite Congressional primacy in lawmaking, other branches have key roles to play
  - The Executive Branch is commonly delegated authority to effectuate and elaborate on Congressional directives through rulemaking ("sublegislative law")
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Regulates:

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  - Listed hazardous waste;
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- **Nonhazardous solid waste "litter" – and thus plastic waste "leakage"- becomes a municipal enforcement issue.**

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CERCLA provides authority to compel responsible parties to respond to, and remediate, **releases of "hazardous substances" from facilities and vessels, and addresses "pollutants or contaminants" posing "imminent and substantial endangerment."**

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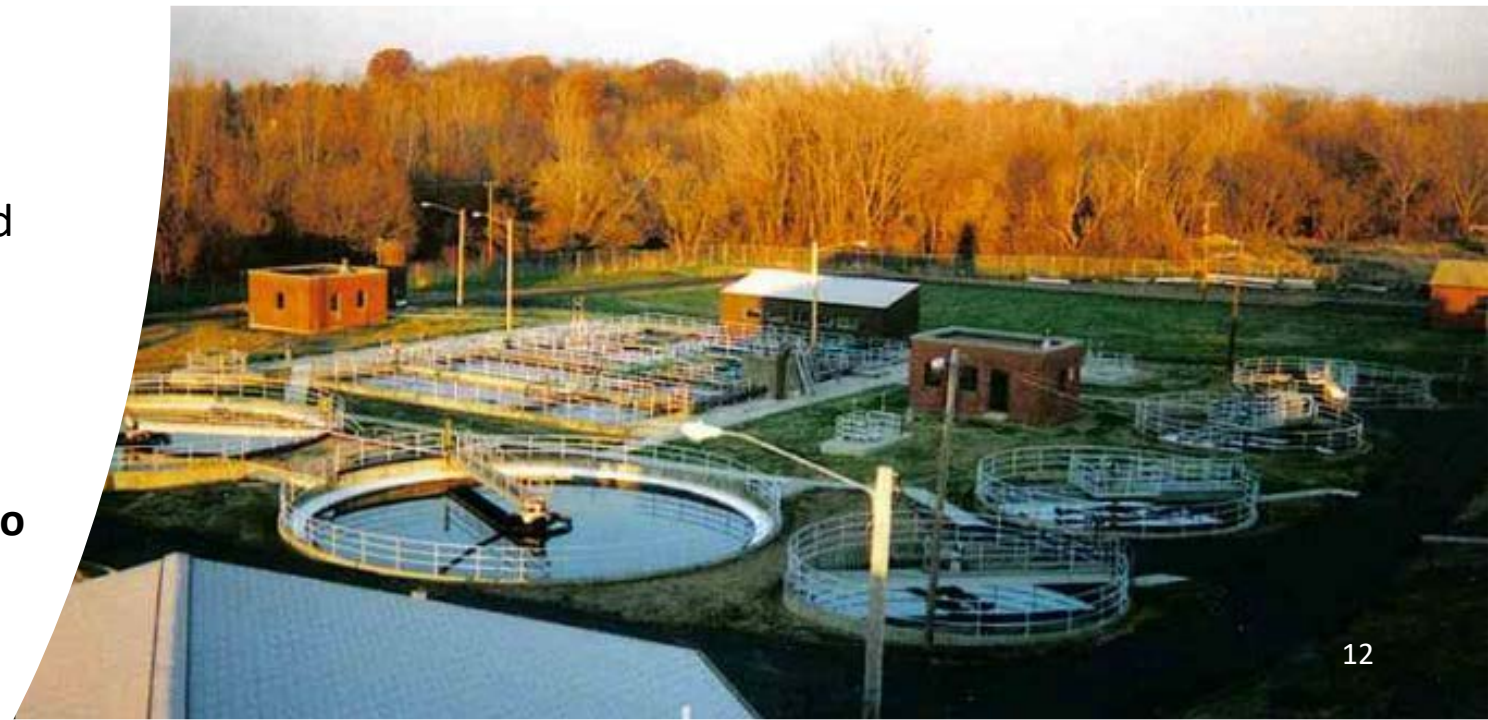
- **Plastic may not be included in NPDES permits unless TSS, and even if it was, may be limited to acceptable discharges of visible plastic.**



Plastic Limits in NPDES Permits?

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UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF TEXAS
VICTORIA DIVISION

SAN ANTONIO BAY ESTUARINE WATERKEEPER, *et al*,	§	
Plaintiffs,	§	
VS.	§	CIVIL ACTION NO. 6:17-CV-0047
FORMOSA PLASTICS CORP, TEXAS, *et al*,	§	
Defendants.	§	

MEMORANDUM AND ORDER

I. INTRODUCTION

This case is brought pursuant to State of Texas laws and the Water Pollution Control Act ("Act"), 33 U.S.C. § 1251 et. seq. Before the Court are the parties: (a)[1] proposed findings of fact and conclusions of law; (b) the testimonial evidence; (c) the arguments of counsel; and, (d) the documentary evidence presented by both the plaintiff, San Antonio Bay Estaurine Waterkeeper and S. Diane Wilson ("Waterkeeper") and the defendants, Formosa Plastics Corp., Texas and Formosa Plastics Corp, U.S.A. ("Formosa")[2].

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BEFORE THE UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

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Petitioners,

vs.

ANDREW WHEELER, ADMINISTRATOR, UNITED STATES ENVIRONMENTAL PROTECTION AGENCY,

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- **Mobile sources** of criteria air pollutants from internal combustion engines.

Microplastics air emissions from ground level sources are generally not covered – leaving no path to directly limit these microplastic emissions to ambient air.

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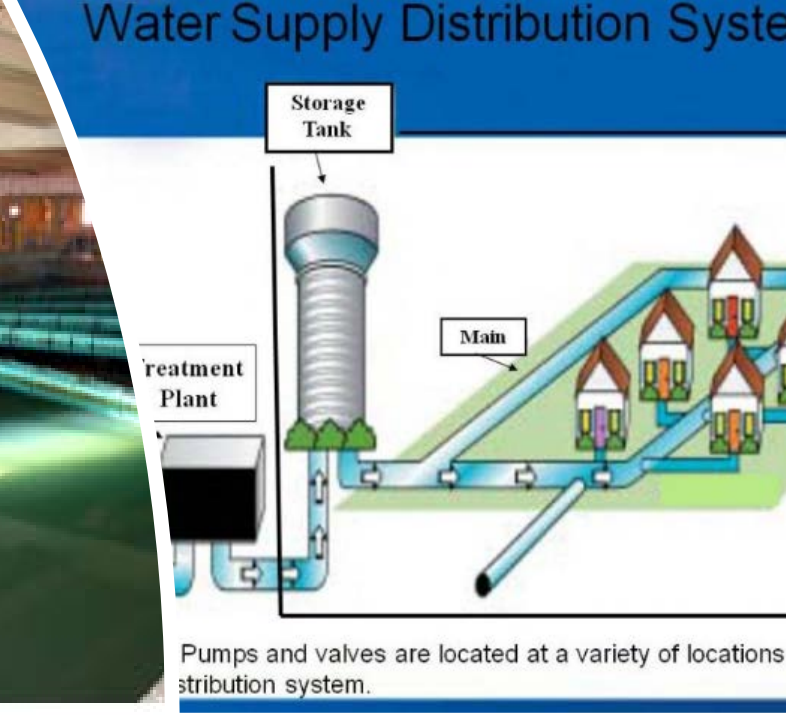
U.S Safe Drinking Water Act, 42 U.S.C. § 300f et seq.



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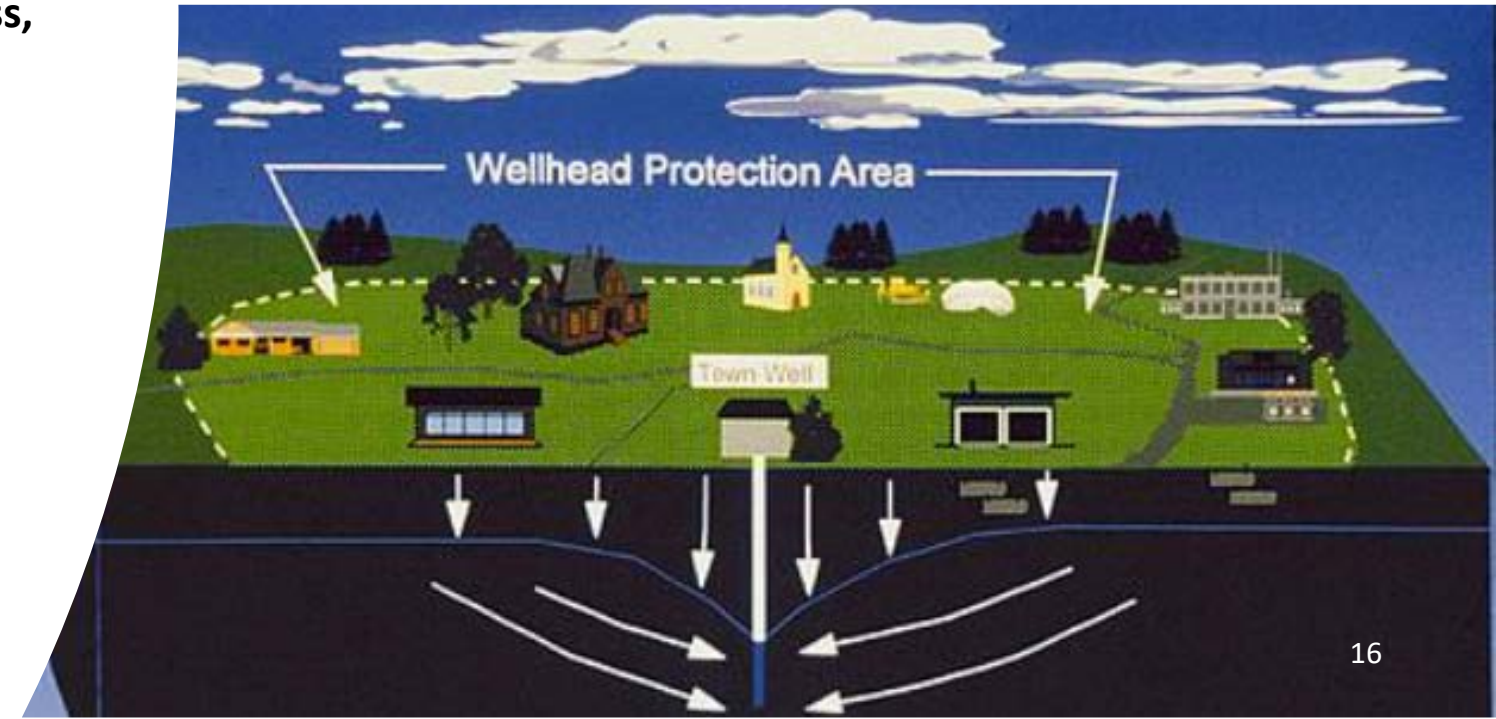

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More inert = less regulated.

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- 22 States with laws in place focused on single-use plastics
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- Reauthorizes the National Oceanic and Atmospheric Administration's Marine Debris Program through 2022.
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- Encourages the executive branch to reach out and engage the leaders of other countries to address marine debris.

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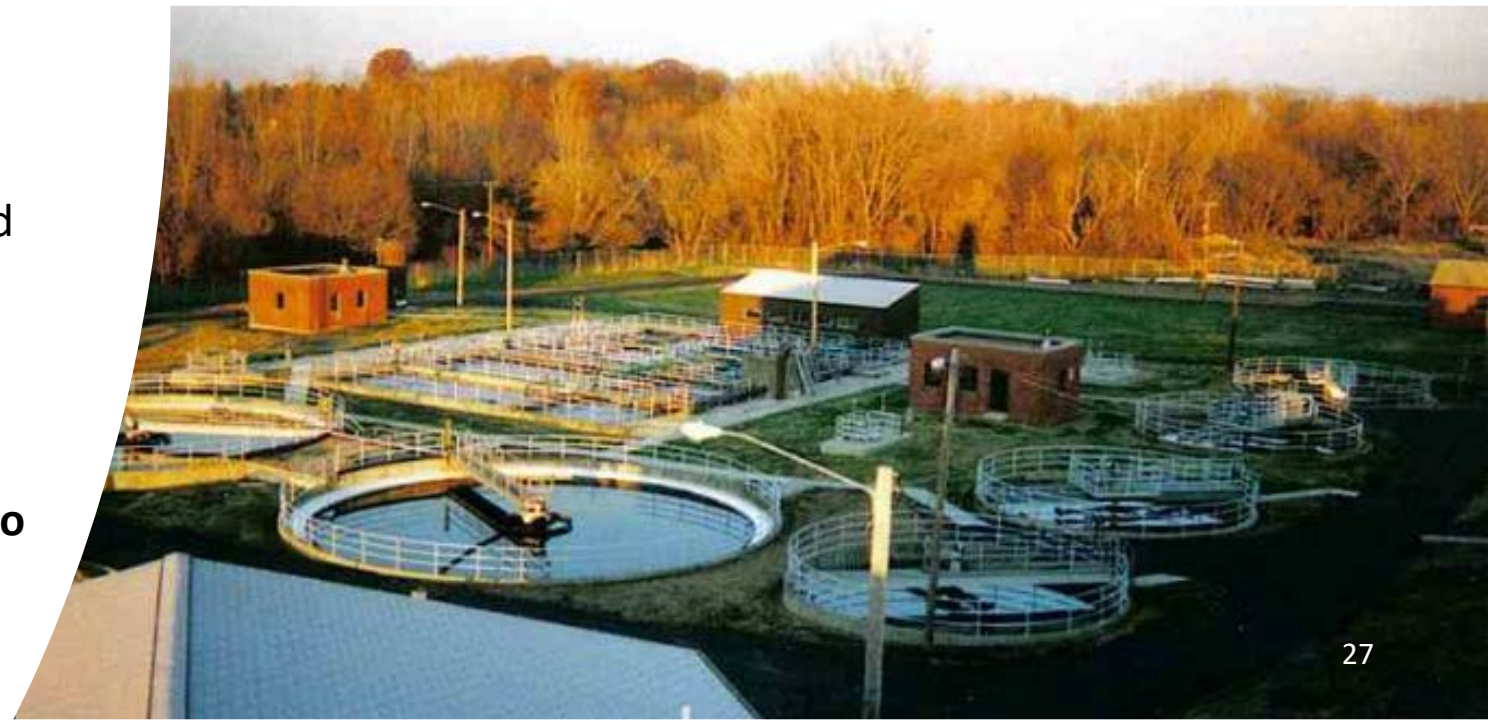

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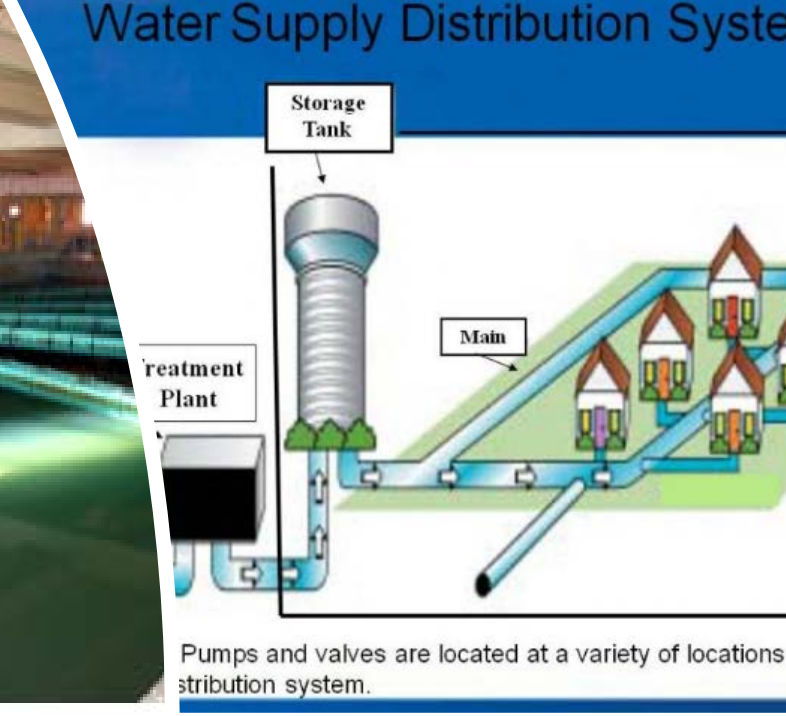

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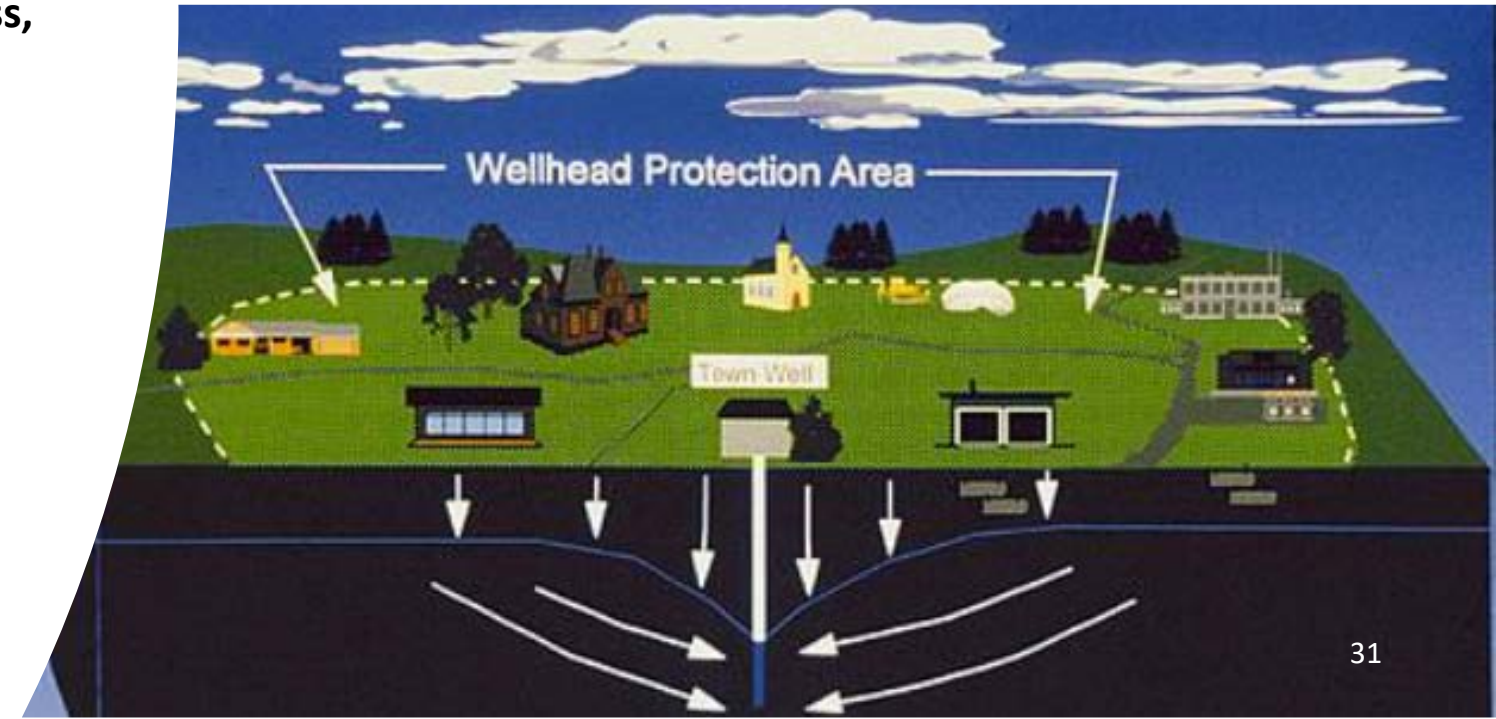

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December 7, 2020

Part 2: Gaps and Solutions

Mary Ellen Ternes, Partner

Earth & Water Law, LLC

Plastic is basically inert, unmanaged, inherently wastelike, and as a result, ubiquitous

- **Unregulated –** US Law barely reaches plastic waste - given original intent to mitigate exposure to prioritized pollutants with recognized toxicity representative of US industry and other sources in the 1960s
- **Highly Variable** – Thousands of distinct polymer variations
- **Forever** – While plastic may leach chemicals, the polymer itself is not a chemical pollutant; the physical form of plastic remains in the environment in smaller and smaller particles virtually forever.
- ***Generally Unrecoverable - As currently generated post—use, without prioritization and limitation of plastic products in our economy supporting a circular economy, we can turn the current heterogeneous waste plastic mix into fuel, make solid construction materials out of it (which might contribute microplastic to the environment) – but to truly return a single original polymer to its equivalent or higher use is not practicable with the current post-use plastic waste mix. And of course, microplastic released from consumable plastic products like tires, fabric and coatings are not recoverable.***
- **Uncharacterized:** Health effects of microplastic exposure is not yet fully characterized, though progress is continuing.
- **Unassigned** – Plastic environmental pollution and upstream sources are just now being assigned legal liability; developments are ongoing internationally through legislation, and through litigation in the US.
- **Misunderstood** – The public has been wholly misinformed about actual recycling dynamics, and believes collecting and sorting enables beneficial material recovery, but gap is now closing.

Solutions?

- **Rather than "uncharted," solutions to Plastic are well charted globally, and toxicological risk assessments are developing.**

ABC's of Plastic Mitigation include: Turn Off the Tap and Mop Up the Spill:

Turn off the tap:

- Eliminate all problematic and unnecessary plastic items.
- Innovate to ensure that the plastics we do need are reusable, recyclable, or compostable.
- Circulate all the plastic items we use to keep them in the economy and out of the environment.

Mop up the spill:

- Set reference doses and remediation thresholds.
- Establish responsible entity construct.
- Remediate environmental plastic.

Global Trends

- **Turned off the Tap with China's 2018 National Sword Policy, and the 2019 Basel Amendments.**
- **Aggressive plastic waste mitigation law and policy** for both macro and microplastic (including microplastic products such as fabric fibers, tire shred and coatings) to ultimately decrease both mass and variety in post-use plastic feedstock thereby enhancing its value, eliminating leakage and promoting compatible polymer chemical recycling by:
  - **Eliminating single/unnecessary uses and product leakage;**
  - **Homogenizing types of plastic in the market;**
  - **Extending producer responsibility for manufacturers and distributors;**
  - **Developing circular economies ensuring sustainable product design and continued use.**

Specific International Developments

- United Nations
- Global Chemicals outlook, March 11, 2019
  - Full disclosure, sound recycling, waste management, **sustainable product design**
  - Supporting "generation of **more inherently valuable secondary raw materials"** in a circular economy
  - Working with the Center for International Environmental Law on "Convention on Plastics and Plastic Pollution" based on the Montreal Protocol
- European Union
  - Circular Economy Action Plan, March 11, 2020
    - **Microplastics (tires, fabrics, coatings)**, including risk assessment for environment, drinking water, foods;
    - **Labelling** to ensure usage of "bio-based," "biodegradable" and "compostable" doesn't confuse consumers;
    - Builds on EU actions in 2018-2019 mandating **reductions in single-use plastics,** setting reduction targets, promoting waste regeneration systems and efficiency optimization and imposing **extended producer responsibility** including responsibility for product's life cycle including separate collection, sorting and treatment operations, and responsibility to prevent waste and ensure reusability and recyclability of products.

International Developments

- United Nations reports, as of July 2018:
  - Plastic bags - **127 out of 192** countries **regulate plastic bags** restricting free retail distribution; 27 assess taxes on manufacture and production; 30 charge consumer fees;
  - **27** countries have **banned or limited production of specific products** (e.g. plates, cups, straws, packaging) and materials (e.g. polystyrene);
  - **43** countries have included elements of **extended producer responsibility** for plastic bags;
  - **63** countries mandate extended producer responsibility for single-use plastics, including deposit-refunds, product take-back, and recycling targets.
  - Several countries have also **banned microbeads** and the European Union has started a process to restrict the intentional addition of microplastics to consumer and professional use products.

China

- 2018 National Sword Policy eliminating 99% of plastic waste imports;
- **Ban or restrict single-use nondegradable plastic products in five plastic consuming sectors;**
- Ban disposable foam plastic tableware, plastic cotton swabs, plastic microbeads in household chemicals;
- **Phase out use of nondegradable plastic shopping bags while producing degradable shopping bag**
- **Commercial reduction of disposable plastic products and find suitable substitutes while cooperating with waste management and recycling companies to collect packaging**

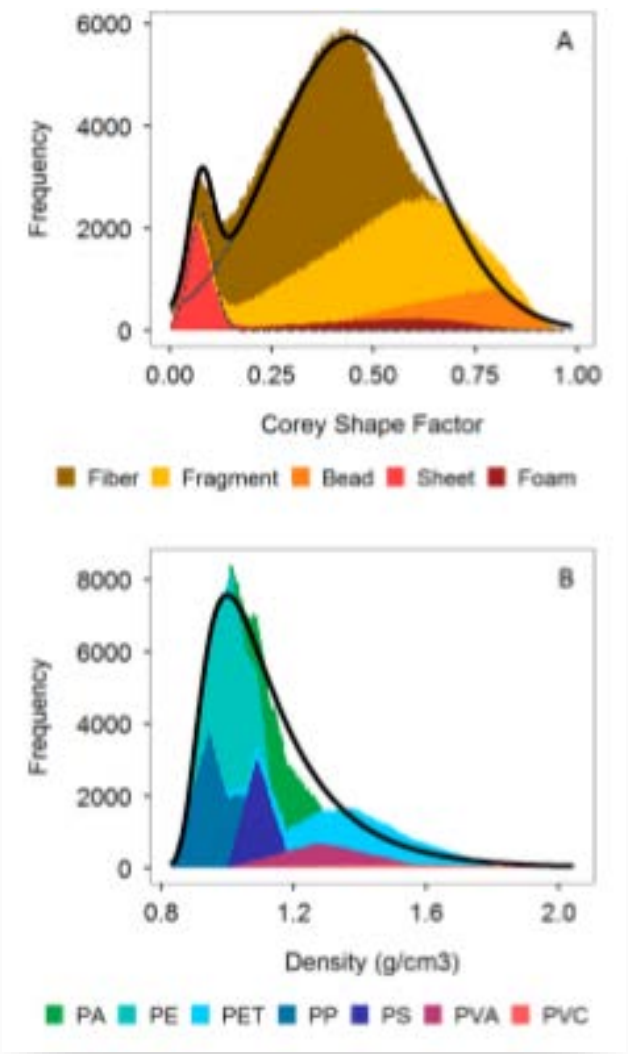
Canada

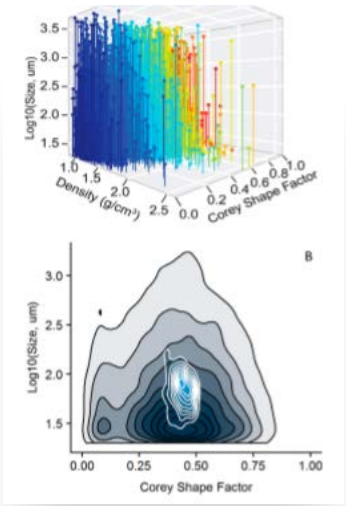
- 2018 Strategy on Zero Plastic Waste: Five Interventions:
  - **Viable, domestic secondary end-markets;**
  - Maximize collection of all plastics;
  - Support and expand all value-recovery options;
  - Increase efficiency throughout the value chain;
  - **Extend plastics lifetime to reduce and delay waste generation.**
- **Ban harmful single-use plastic by 2021**

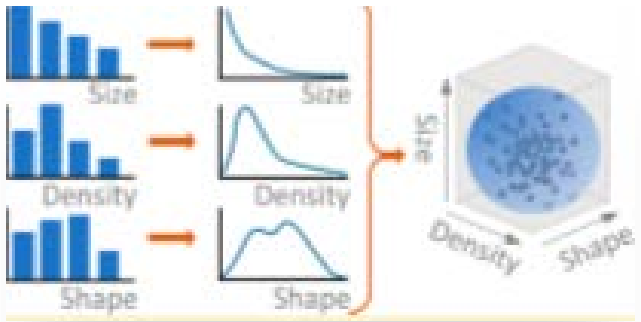
Common Law

Legal Claims Require Proof of "Injury" to meet "Standing" requirements

- Plaintiffs must have **"standing"**
  - **injury in fact**, which means an invasionof a legally protected interest that is **concrete and particularized, and actual or imminent, not conjectural or hypothetical**;
  - a **causal relationship** between the injury and the challenged conduct, i.e., the injury can be fairly traced to the **challenged action of the defendant**, and has **not resulted from the independent action of some third party** not before the court; and
  - a likelihood that the injury will be **redressed by a favorable decision**, which means that the prospect of obtaining relief from the injury as a result of a favorable ruling is not too speculative.
- Claims Must be ripe and not moot
- Necessary and Indispensable Parties
- **Burden of Proof – For Civil Claims, Preponderance of the Evidence**







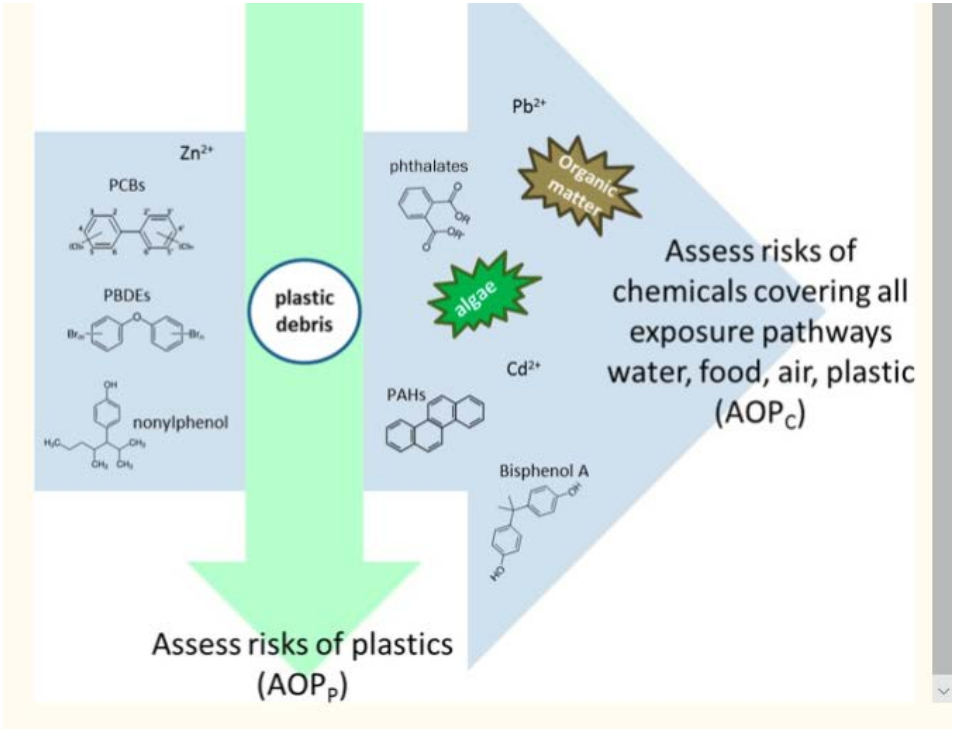
Simplifying Microplastic via Continuous Probability Distributions for Size, Shape, and Density

Merel Kooi* and Albert A. Koelmans

Aquatic Ecology and Water Quality Management Group, Wageningen University & Research, P.O. Box 47, 6700 AA Wageningen, The Netherlands

Risks of Plastic Debris:
Unravelling Fact, Opinion, Perception, and Belief

Albert A. Koelmans,*,†,‡ Ellen Besseling,†,‡ Edwin Foekema,‡,§ Merel Kooi,† Svenja Mintenig,∥,⊥ Bernadette C. Ossendorp,# Paula E. Redondo-Hasselerharm,† Anja Verschoor,# Annemarie P. van Wezel,∥,⊥ and Marten Scheffer

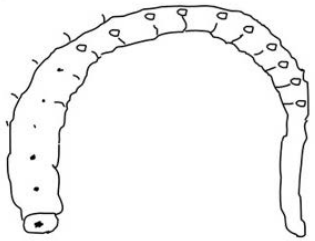


Humans

Plastic type	ERM nr	Suggested ERM	Potentially Relevant (Y/N)
Nanoplastic	1	#	Y
Highly contaminated microplastic	2	C	Y
'Clean' microplastic	3	#	Y
Rugby ball sized plastic item	4	#	N
Fishing net	5	#	N

Assess combined stressor effects

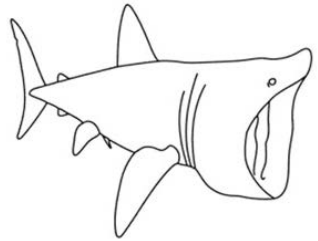
Lugworm



Plastic type	ERM nr	Suggested ERM	Potentially Relevant (Y/N)
Nanoplastic	1	#	Y
Highly contaminated microplastic	2	C	Y
'Clean' microplastic	3	#	Y
Rugby ball sized plastic item	4	#	N
Fishing net	5	#	N

Assess combined stressor effects

Basking shark



Plastic type	ERM nr	Suggested ERM	Potentially Relevant (Y/N)
Nanoplastic	1	#	Y
Highly contaminated microplastic	2	C	Y
'Clean' microplastic	3	#	N
Rugby ball sized plastic item	4	#	Y
Fishing net	5	#	Y

Assess combined stressor effects

Quantifying Ecological Risks of Aquatic Micro- and Nanoplastic

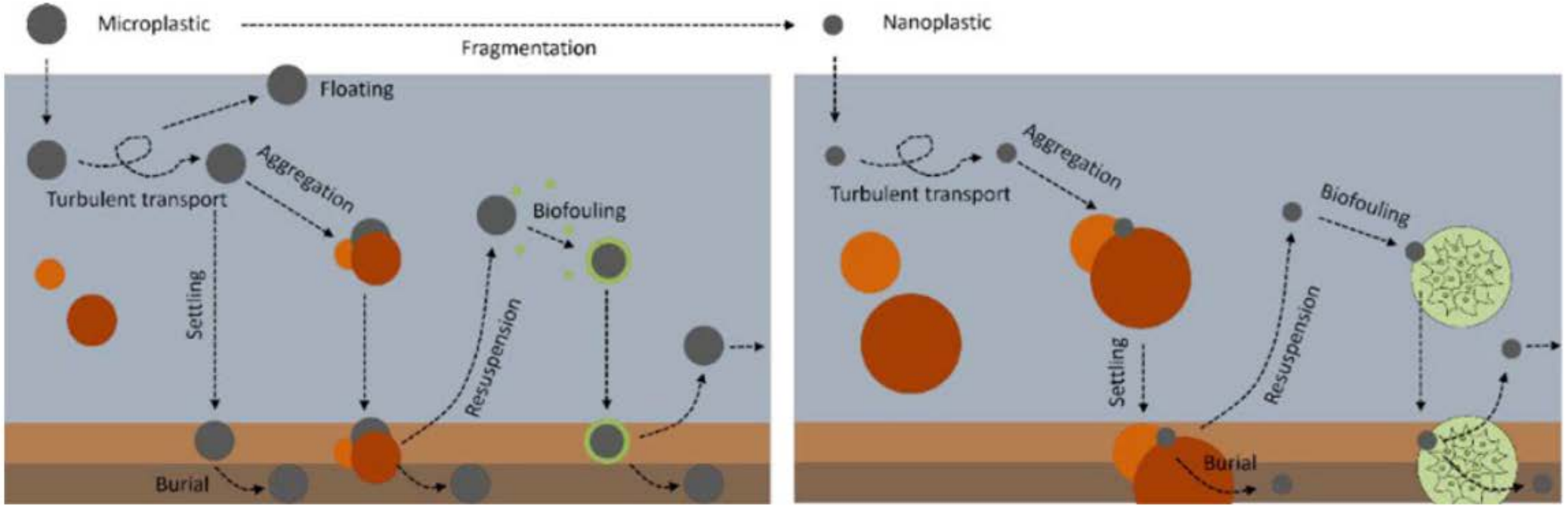


Figure 2. Processes that affect the fate of plastic particles in the aquatic environment, adapted from Kooi et al. (2017).

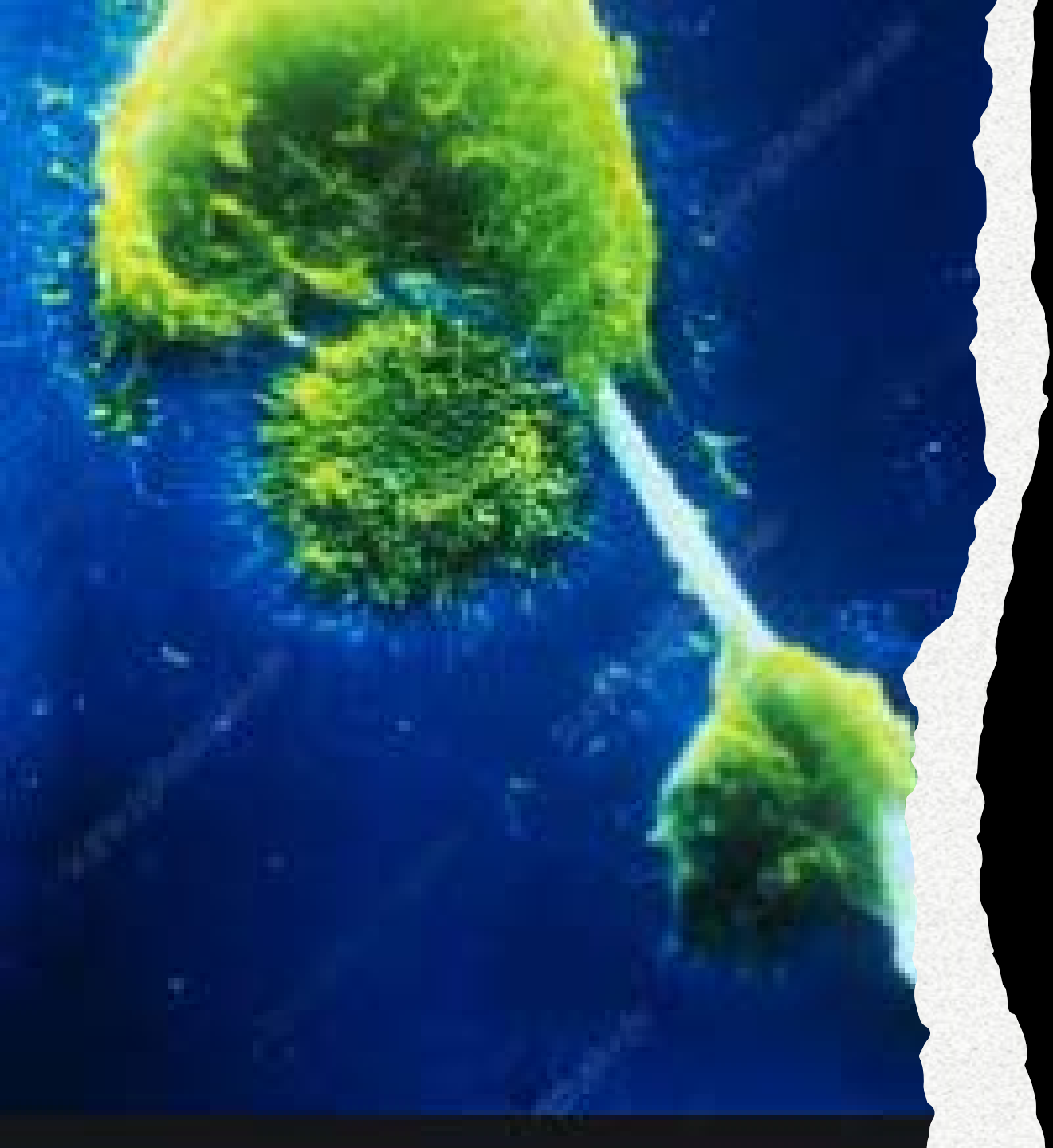
Ellen Besseling, Paula Redondo-Hasselerharm, Edwin M. Foekema & Albert A. Koelmans (2019) Quantifying ecological risks of aquatic micro- and nanoplastic, Critical Reviews in Environmental Science and Technology, 49:1, 32-80, DOI: 10.1080/10643389.2018.1531688

Table 5. Summary of published effect threshold data of micro- and nanoplastic on organisms. Thresholds: LC_{50}: lethal dose 50%, EC_{50}: effect concentration 50%, LOEC: lowest observed effect concentration, NOEC: no observed effect concentration.

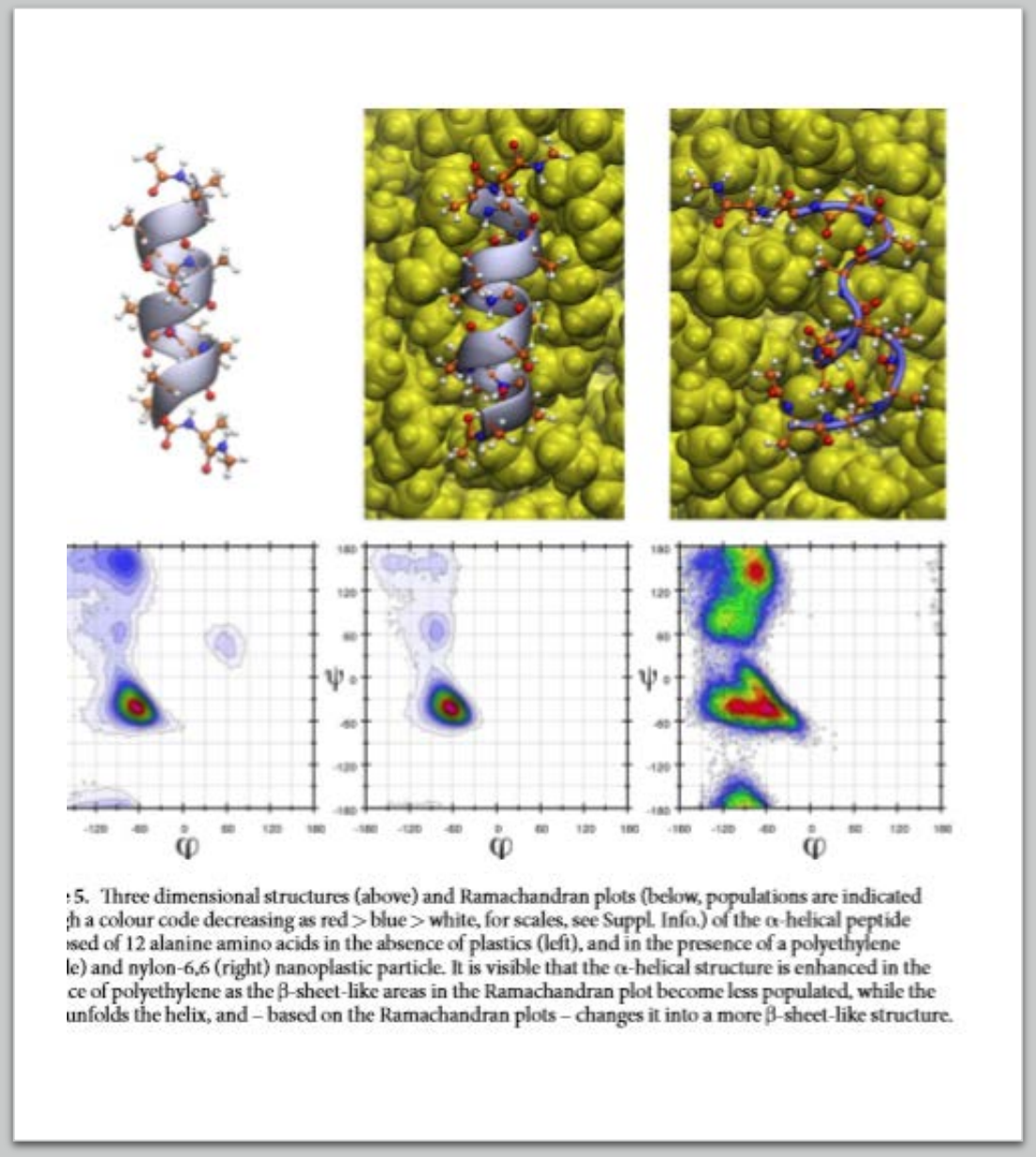
Exposure medium	Size category	Ecosystem	LC_{50}	EC_{50}	LOEC	NOEC
Water (mg/L)	Micro	Fresh	0.4 – 57	5 – 172	6.9×10^{-9} – 2×10^{5}	0.02 – 400
		Brackish	23.5	0.04 – 0.1	6.9×10^{-9} – 1.8×10^{4}	0.4 – 313
		Marine	–	–	9.1×10^{-3} – 2.5×10^{3}	2×10^{-3} – 510
	Nano	Fresh	4 – 36	0.5 - 1.6	4.5 - 1×10^{3}	0.5 – 1
		Brackish	0.2 – 2.2	–	–	1 – 313
		Marine	0.8 – 3.9	13	0.1 – 250	10 – 100
Sediment/food (g/kg DW)	Micro	Fresh	–	–	–	700
		Brackish	–	–	–	–
		Marine	–	–	0.1 - 100	0.3 - 100
	Nano	Fresh	–	–	1	–
		Brackish	–	–	–	–
		Marine	–	–	–	–

Table 6. Preliminary safe standard (PSS) values for exposure to micro- and nanoplastic via different compartments in different ecosystems. HC_5: hazardous concentration for 5% of the species, LOEC: lowest observed effect concentration, AF: assessment factor, 95% CI: 95% confidence interval.

Size category	Ecosystem	Exposure medium	HC_5	LOEC	AF	PSS
Micro plastic	Aquatic environment	Water	2.0 ng/L		5	0.4 ng/L (95% CI: 3.6×10^{-4} – 4.5×10^{2})
		Food/Sediment		0.1 g/kg DW	1000	0.1 mg/kg DW
Nano plastic	Aquatic environment	Water	5.4 µg/L		5	1.1 µg/L (95% CI: 0.19 – 6.2)
		Food		1 g/kg DW	1000	1 mg/kg DW



Remember this?



5. Three dimensional structures (above) and Ramachandran plots (below, populations are indicated h a colour code decreasing as red > blue > white, for scales, see Suppl. Info.) of the α-helical peptide sed of 12 alanine amino acids in the absence of plastics (left), and in the presence of a polyethylene le) and nylon-6,6 (right) nanoplastic particle. It is visible that the α-helical structure is enhanced in the ce of polyethylene as the β-sheet-like areas in the Ramachandran plot become less populated, while the unfolds the helix, and – based on the Ramachandran plots – changes it into a more β-sheet-like structure.

Nanoplastics can change the secondary structure of proteins.

"A fully α-helical structure changed spontaneously into a β-loop-like conformation on the surface of the corresponding plastic nanoparticle."

Similar to mechanisms seen in:

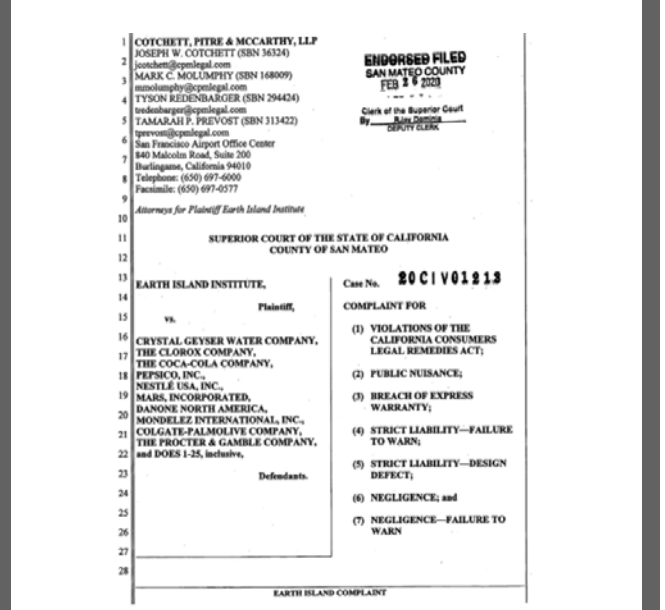
- "Mad Cow Disease" (prion disease bovine spongiform encephalopathy)

-Alzheimer's disease

Hollóczki O and Gehrke S (2019) Nanoplastics can change the secondary structure of proteins. Scientific Reports 9: 16013. doi: 10.1038/s41598-019-52495-w

Earth Island v. Crystal Geyser, Clorox, Coca-Cola, Pepsico, Nestle, Mars, et al.

- In a very real sense, much of the plastic that is labeled “recyclable” is false and misleading due to the inability of consumers to access facilities that will actually recycle Defendants’ Products. ¶ 15.
- CA Consumers Legal Remedies Act
- Public Nuisance
- Breach of Express Warranty
- Strict Liability-Failure to Warn
- Negligence and Negligence – Failure to Warn



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Attorneys for Plaintiff Earth Island Institute

ENDORSED FILED
SAN MATEO COUNTY
FEB 26 2020
Clerk of the Superior Court
By _____ Nina Demice
DEPUTY CLERK

SUPERIOR COURT OF THE STATE OF CALIFORNIA
COUNTY OF SAN MATEO

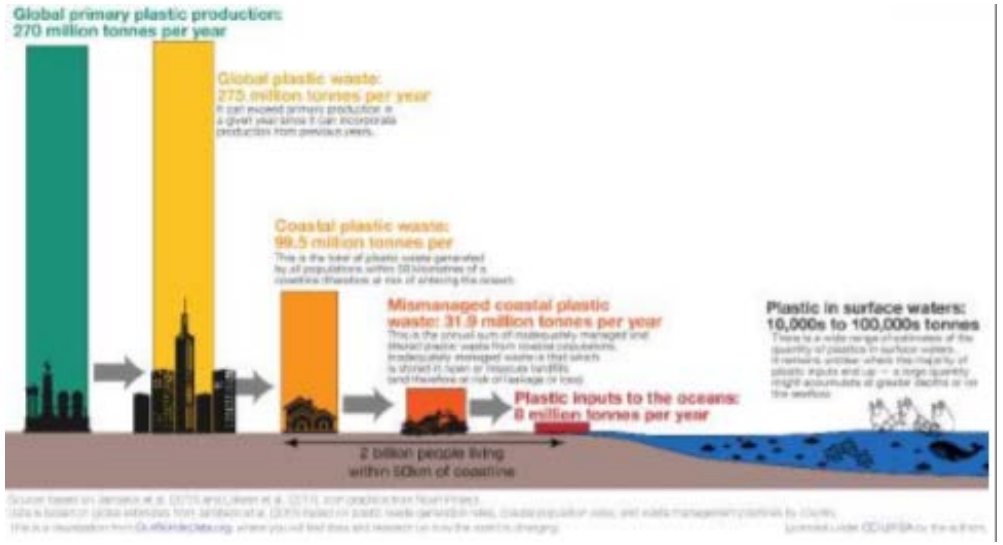
EARTH ISLAND INSTITUTE,
Plaintiff,
vs.
CRYSTAL GEYSER WATER COMPANY, THE CLOROX COMPANY, THE COCA-COLA COMPANY, PEPSICO, INC., NESTLÉ USA, INC., MARS, INCORPORATED, DANONE NORTH AMERICA, MONDELEZ INTERNATIONAL, INC., COLGATE-PALMOLIVE COMPANY, THE PROCTER & GAMBLE COMPANY, and DOES 1-25, inclusive,
Defendants.

Case No. 20CIV01213

COMPLAINT FOR
(1) VIOLATIONS OF THE CALIFORNIA CONSUMERS LEGAL REMEDIES ACT;
(2) PUBLIC NUISANCE;
(3) BREACH OF EXPRESS WARRANTY;
(4) STRICT LIABILITY—FAILURE TO WARN;
(5) STRICT LIABILITY—DESIGN DEFECT;
(6) NEGLIGENCE; and
(7) NEGLIGENCE—FAILURE TO WARN

EARTH ISLAND COMPLAINT

[5] *Mouth of Los Angeles River, Long Beach, CA*, PLASTIC POLLUTION COALITION, Photo Credit: Bi
McDonald / Algalita Foundation, https://www.flickr.com/photos/plasticpollution/4349812433/.



Next Steps for Plastic

Comprehensive National Plastic Legislation and Regulation, based on "perpetual existence" as well as toxicity of leaching chemical additives and degradation byproducts, mandating:

- **Prohibitions that prioritize, limit or eliminate single use plastics, including microplastic shedding plastic products "consumed" through use such as tires, fabrics and coatings;**
- **Life-cycle management supporting circular economy including extended product stewardship better integrating material development, commercialization, manufacturing and distribution;**
- **Recognition of additional criteria for assessing prospective risk from new materials considering perpetual presence in the environment**; consider categorizing resistance to degradation as multipliers of natural material degradation for regulatory purposes.

Environmental risk assessment and remediation thresholds – must characterize risk from biological interference due to physical presence of persistent, generally inert material, and implications from adsorption and implications of electrochemical properties as well as emerging chemical toxicities:

- Develop **methods and metrics** for defining and assessing potential for physical harm by inert material at the macro and micro level as discussed here, considering surface chemistry. Consider approach analogous to Nanotechnology review.
- Develop **qualitative and quantitative methods** to assess all relevant categories (including size, type, shape, surface chemistry, contaminants) of inert material in our biological and environmental systems.
- Define scope of chemical footprint from all plastic uses, including additives, for example, to automobile tires - 6PPD (2-anilino-5-([4-methylpentan-2-yl]amino)cyclohexa-2,5-diene-1,4-dione), which degrades with ozone to 6PPD-quinone, recently shown to be acutely toxic to salmon at concentrations of 0.8 ug/l.

SOLID WASTE ASSOCIATION OF NORTH AMERICA

The Current State of Plastics Waste Management System and Infrastructure

David Biderman
Executive Director & CEO
dbiderman@swana.org

SWANA
SOLID WASTE ASSOCIATION OF NORTH AMERICA

What is SWANA?

Largest association for the waste & recycling sector in the U.S. & Canada

- 10,700+ individual members
- 47 chapters
- Members in private & public sectors - unique

Core programs focus on education, research, advocacy and safety – and our mission is "**advancing from solid waste management to resource management**"

- Before COVID-19, recycling was our #1 issue, and it will be again in 2021.

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Recycling Challenges

SWANA has been a leader in providing information and guidance to recycling stakeholders since National Sword was announced in 2017

- China's National Sword program exposed the vulnerabilities of America's recycling system
  - Contamination – plastic bags, food, tanglers, batteries
  - Dependent on exports
  - Fragmented – houses/multi-family/commercial
  - Low access and participation rates
  - Older technologies/sorting systems at recycling sites
  - Patchwork of differing rules and regulations
  - Changing stream
    - Lightweighting of plastic containers
    - Flexible plastics
    - Small cardboard in residential
    - Some MRFs were built to process newspapers, not Amazon boxes
  - Confusing labeling of plastics

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Confusing Symbols

Understanding Plastic Recycling Symbols

Action Environmental customers can recycle all plastic items numbered 1-7 via our curbside recycling program.
If a plastic item is deemed unrecyclable (typically plastics 3 and 6), Action Environmental will dispose of it properly.

Symbol	Polymer Name	Product Examples	Recyclable Curbside?
1 PETE	Polyethylene Terephthalate (PETE or PET)	• Soft drink bottles • Water bottles • Sports drink bottles • Salad dressing bottles • Vegetable oil bottles • Peanut butter jars • Pickle jars • Jelly jars • Prepared food trays • Mouthwash bottles 	Yes
2 HDPE	High-density Polyethylene (HDPE)	• Milk jugs • Juice bottles • Yogurt tubs • Butter tubs • Cereal box liners • Shampoo bottles • Motor oil bottles • Bleach/detergent bottles • Household cleaner bottles • Grocery bags 	Yes *Plastic grocery bags not accepted
3 V	Polyvinyl Chloride (PVC or V)	• Clear food packaging • Wire/cable insulation • Pipes/fittings • Siding • Flooring • Fencing • Window frames • Shower curtains • Lawn chairs • Children's toys 	Not accepted through most curbside recycling programs.
4 LDPE	Low-density Polyethylene (LDPE)	• Dry cleaning bags • Bread bags • Frozen food bags • Squeezable bottles • Wash bottles • Dispensing bottles • 6 pack rings • Various molded laboratory equipment 	Yes
5 PP	Polypropylene (PP)	• Ketchup bottles • Most yogurt tubs • Syrup bottles • Bottle caps • Straws • Dishware • Medicine bottles • Some auto parts • Pails • Packing tape 	Yes
6 PS	Polystyrene (PS)	• Disposable plates • Disposable cutlery • Cafeteria trays • Meat trays • Egg cartons • Carry out containers • Aspirin bottles • CD/video cases • Packaging peanuts • Other Styrofoam products 	Not accepted through most curbside recycling programs.
7 OTHER	Other Plastics (OTHER or O)	• 3/5 gallon water jugs • Citrus juice bottles • Plastic lumber • Headlight lenses • Safety glasses • Gas containers • Bullet proof materials • Acrylic, nylon, polycarbonate • Polylactic acid (a bioplastic) • Combinations of different plastics 	Yes

ACTION Environmental Group

Action Environmental Group
www.actioncarting.com

INTERSTATE IWS WASTE SERVICES

SWANA

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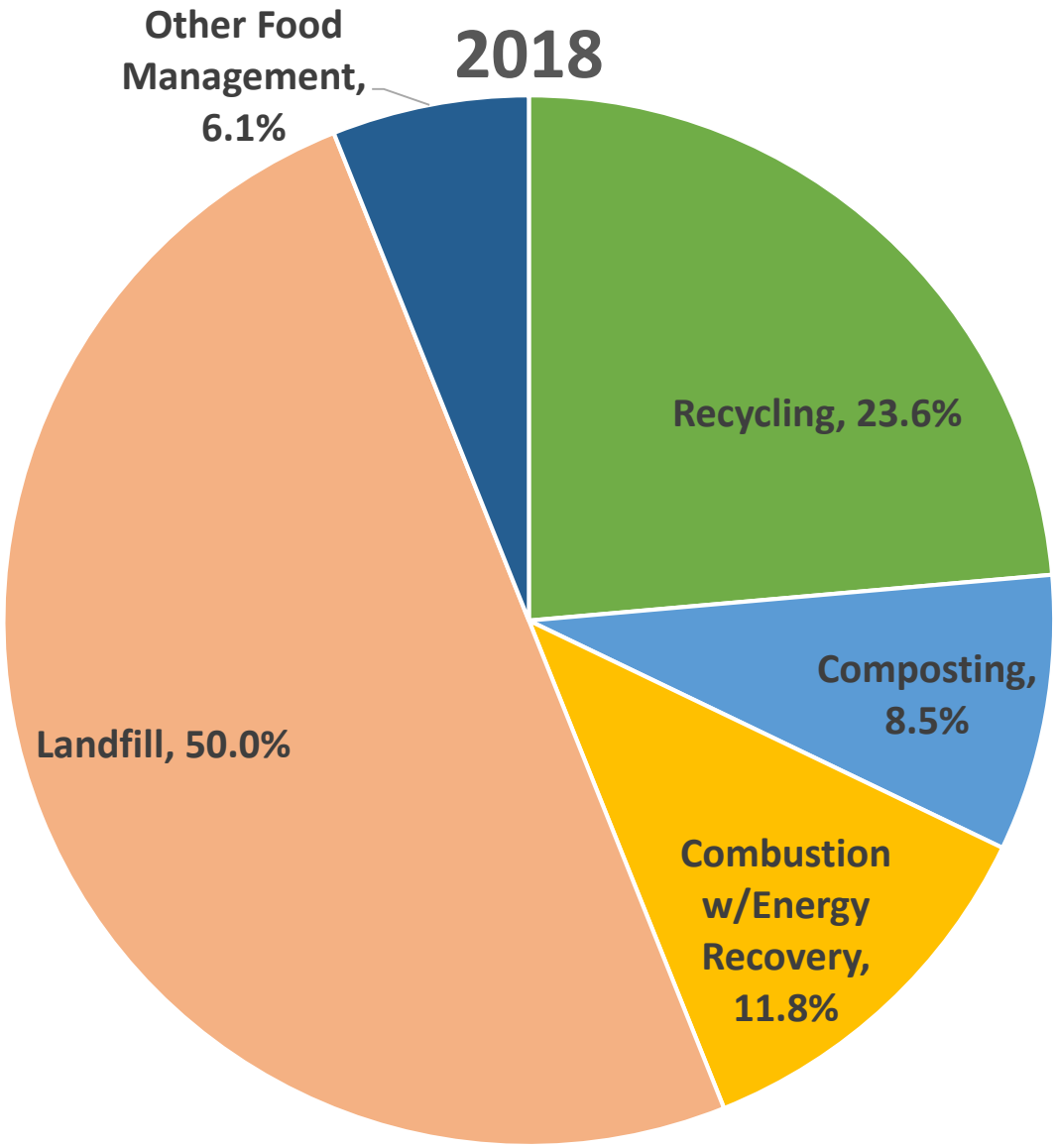
EPA Data on MSW Management



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EPA Data on Discarded Plastic

Discarded Plastic is a small percentage of overall municipal solid waste and recycling

- Discarded plastic is 12% of the overall MSW generation
  - US generates 292M tons/MSW/year – food and paper are 21-23%
- 3 million of the 35.7 million tons of discarded plastic were recycled
  - 8.5% - and declining in recent years
- Only 4.4% of recycled material is plastic
  - 66% of recyclables are paper/fiber
  - 12% is metals

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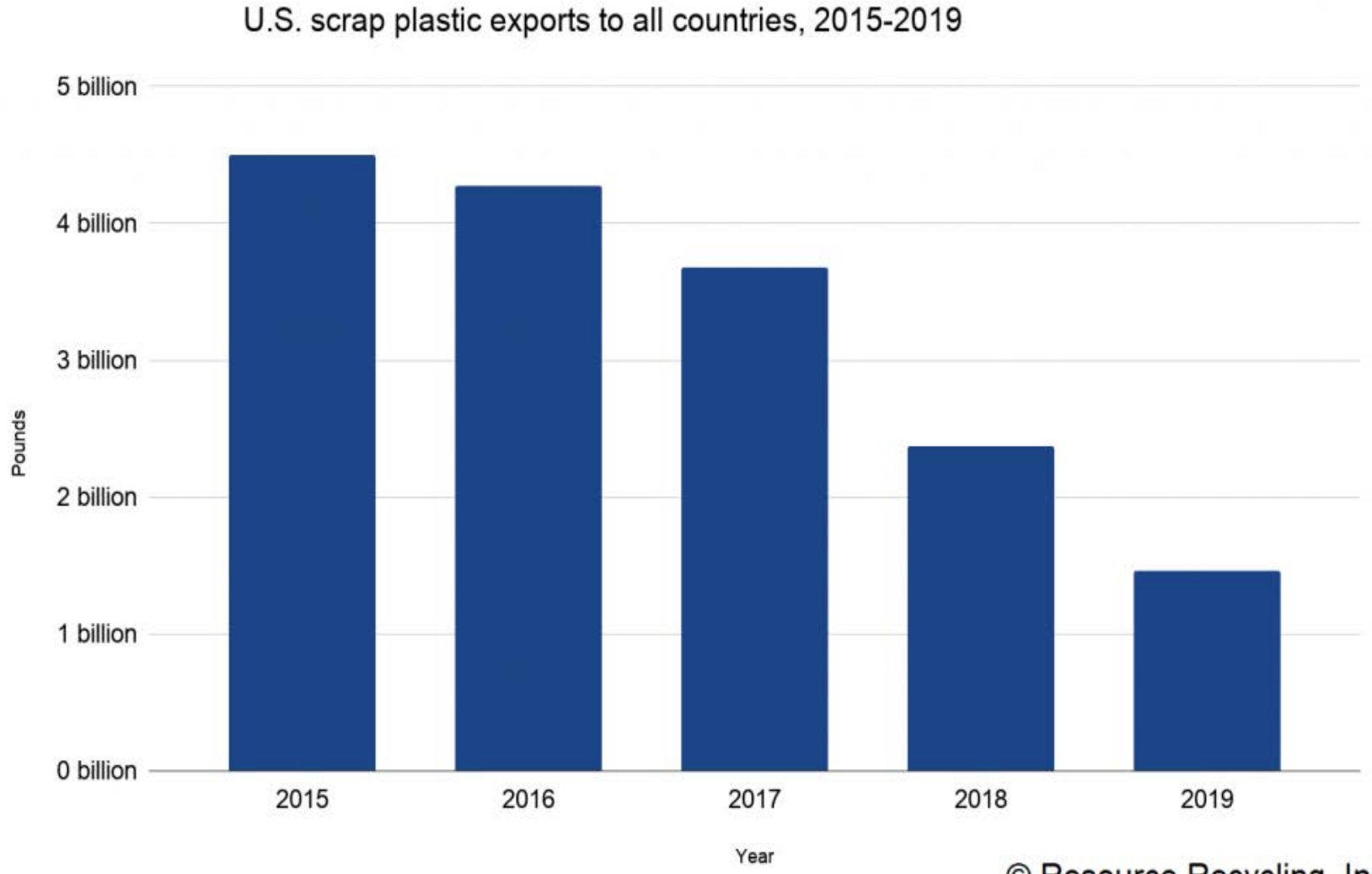

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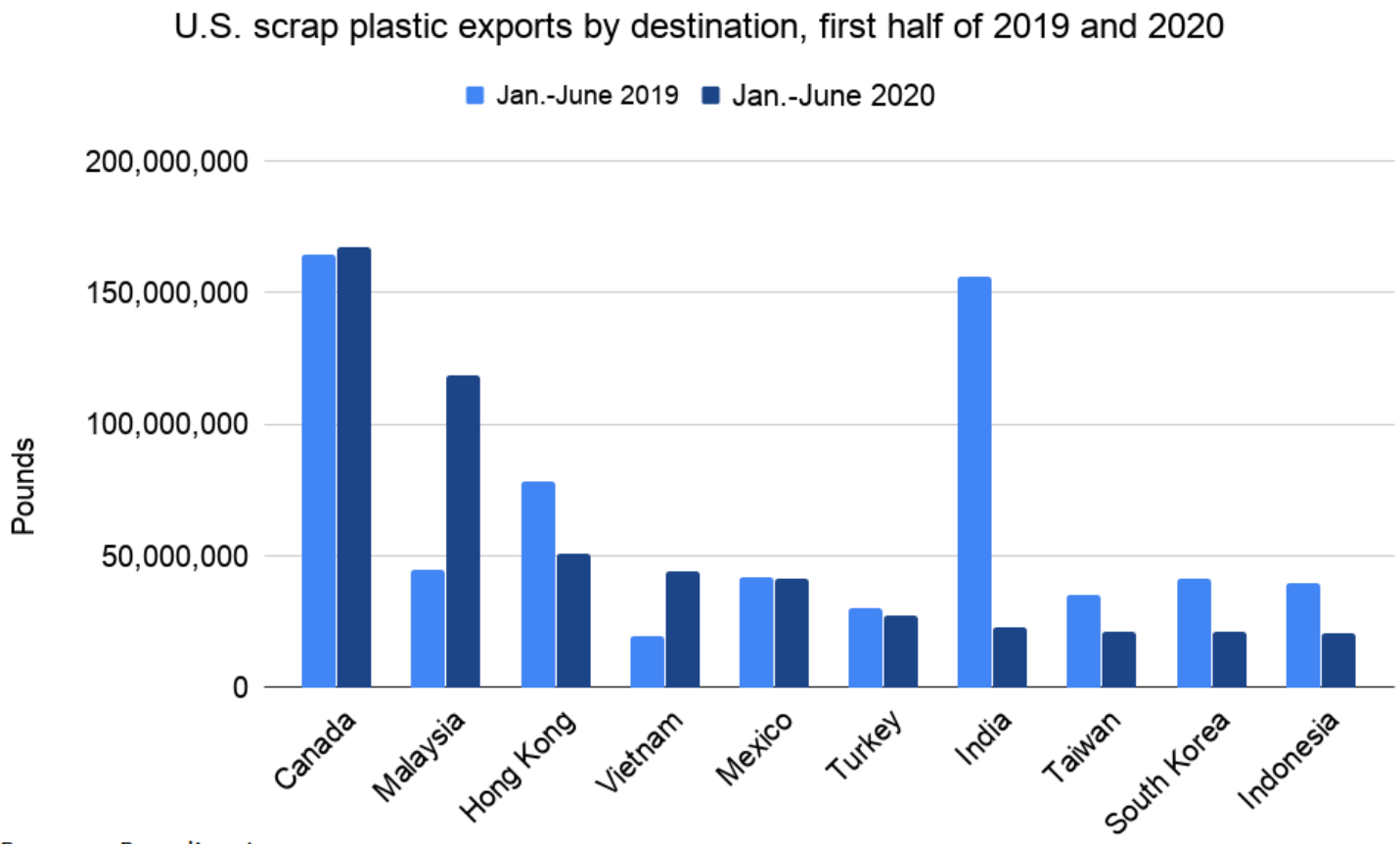
Plastics Exports Declined 18% in 2020 v 2019



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Impact of National Sword

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EPA Activities - Recycling

In November 2018, EPA held a Recycling Summit. SWANA and 45 other industry leaders took a pledge to work together to improve recycling in the U.S.

In November 2019, EPA issued a "Framework" for addressing the challenges facing recycling

EPA established 4 Workgroups – SWANA involved in all

In November 2020, EPA issued a proposed goal of recycling 50% of MSW by 2030

-U.S. currently recycles 32% (2018 EPA data)

EPA currently working on finalizing a federal "Recycling Strategy" coming out in Spring 2021

-Reduce Contamination

-Improve Processing Efficiency

-Improve Markets

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Congress

SWANA has been heavily involved in federal policy discussions

- Communicating frequently with federal/state/local officials
  - Active participant in EPA's America Recycles network
  - SWANA submitted testimony at hearings & supports federal bills providing funds to local agencies and others for recycling
    - **Save Our Seas 2.0** – creates a Post-Consumer Materials management infrastructure Grant program that would provide $55M/year for 5 years – **Bill passed House and Senate** and awaiting signature at White House!
    - **RECOVER Act** – would provide $500M over 5 years
    - **RECYCLE Act** – would provide $15M/year for 5 years; EPA would develop a model recycling program toolkit
    - **Break Free From Plastic Act** – bans single use plastics, establishes national Extended Producer Responsibility (EPR) and bottle bill/container deposit program

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Responses to National Sword (2017-2020)

As recovered plastic and other recyclables shift from foreign to domestic markets:

- Some local governments are cutting back on curbside collection
  - Some communities are sending some types of plastic to disposal
- Huge focus on reducing **contamination**
  - Some progress is being made – WM reported in-bound contamination has declined from 24 to 18%
- Recycling contracts being renegotiated
- Chemical/Advanced recycling & PTF
- Many MRFs investing in new equipment – including robots/AI
- More collaboration upstream and downstream
  - What do buyers of recycled material want?
  - Lots of companies announcing recycled content “goals” for 2025 and 2030 – creates demand

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Nexus Between Plastic and Marine Litter

- **Some companies don't want to be blamed for Marine Litter and Ocean Plastic**



- U.S. Strategy for Addressing Global Issue of Marine Litter (Oct 2020)
  - Build capacity
  - Incentivize global recycling market
  - Research/Innovation
  - Marine Litter removal

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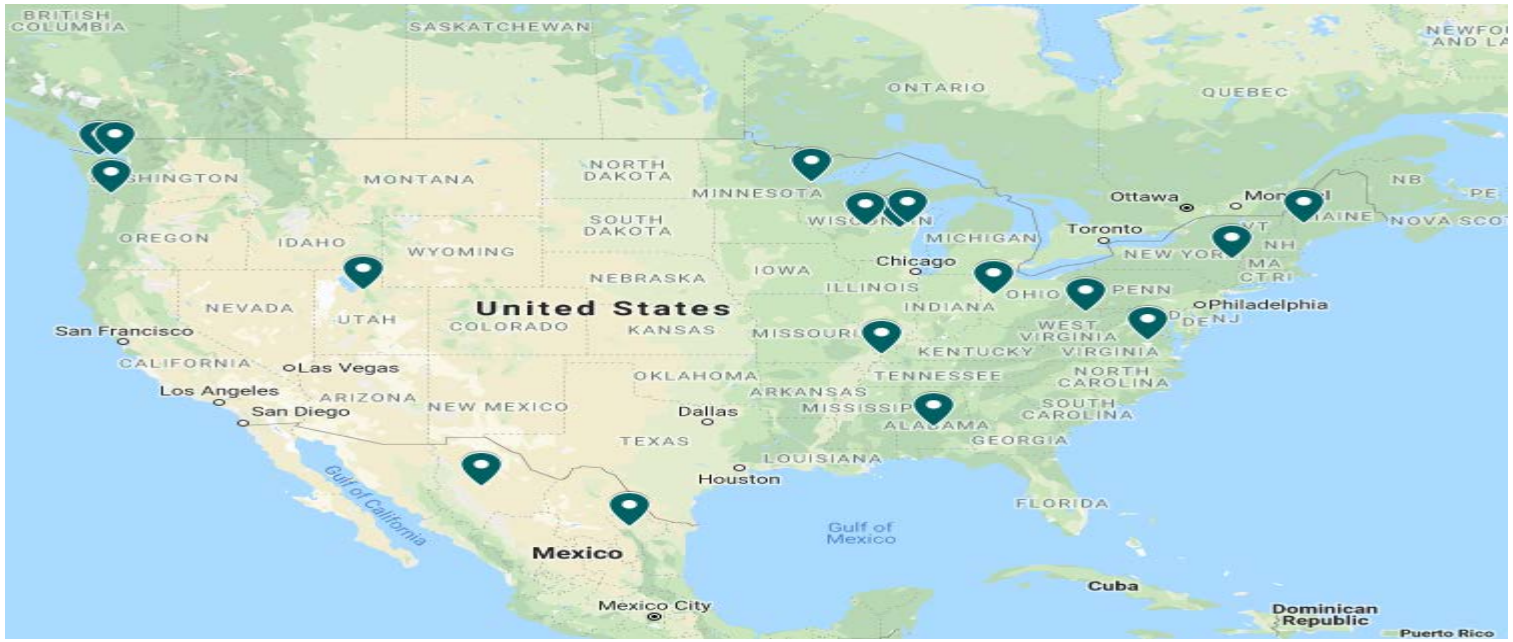
U.S. & Chinese companies are investing in domestic processing capacity in the U.S.

- 30+ plants coming on-line late 2020-2022 (20 paper,14 plastic)
- 1.1 billion pounds scrap plastic (Calif/South)
- Impact of pandemic on plans unclear



THANK YOU

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REDUCING PLASTICS IN CALIFORNIA WATERS THROUGH TRASH CONTROL

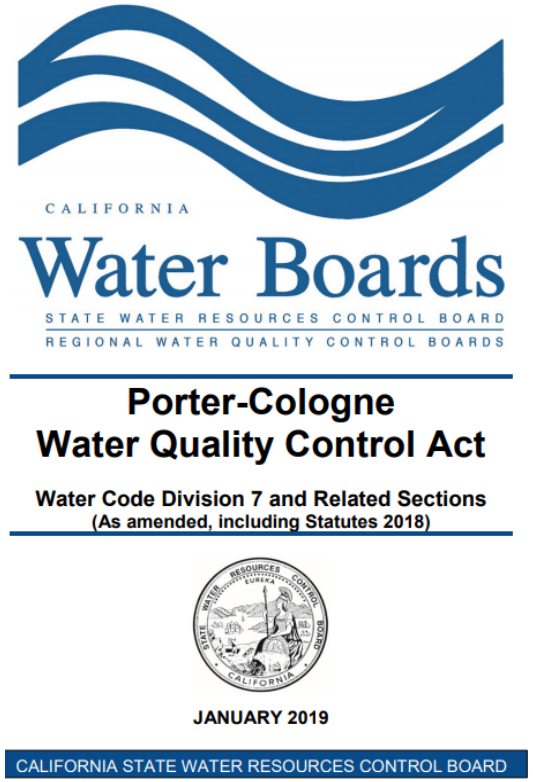
National Academies of Sciences, Engineering and Medicine

December 7, 2020 Public Meeting

Jon Bishop, Chief Deputy Director
State Water Resources Control Board

CALIFORNIA
Water Boards

PLASTICS REDUCTION IN CALIFORNIA WATERS



State and Regional Water Boards:

- Reduce plastics in surface waters through regulatory source control and trash management requirements
- Implement legislation on source control of preproduction plastics (i.e. AB 258 (2007)) requiring best management practices to control preproduction plastics
- Require solids removal and trash management through regulatory permits for wastewater and stormwater discharges

PLASTICS REMOVAL IN MUNICIPAL AND INDUSTRIAL WASTEWATER

- Large and medium size objects (including plastics) removed at industrial sites (pretreatment) and wastewater treatment plant headworks
- Smaller plastics removed with wastewater solids and handled through sludge management
- Plastics removed to produce high quality sludge for land application where permissible
- Remaining sludge transported to landfills

TRASH TO CALIFORNIA WATERS THROUGH STORMWATER

Discarded trash + rain

⇩

Runoff + trash

⇩

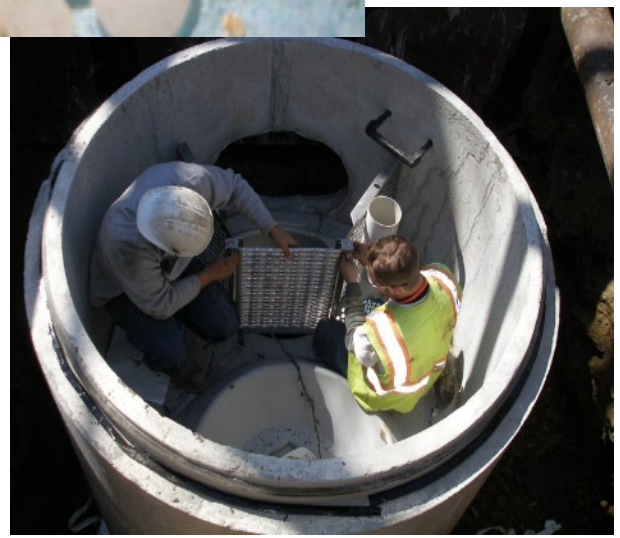
Storm drain system + runoff + trash

⇩

Receiving water + runoff + trash

About 70% of trash is composed of plastics

(*2014, Bay Area Stormwater Management Agencies Association*)



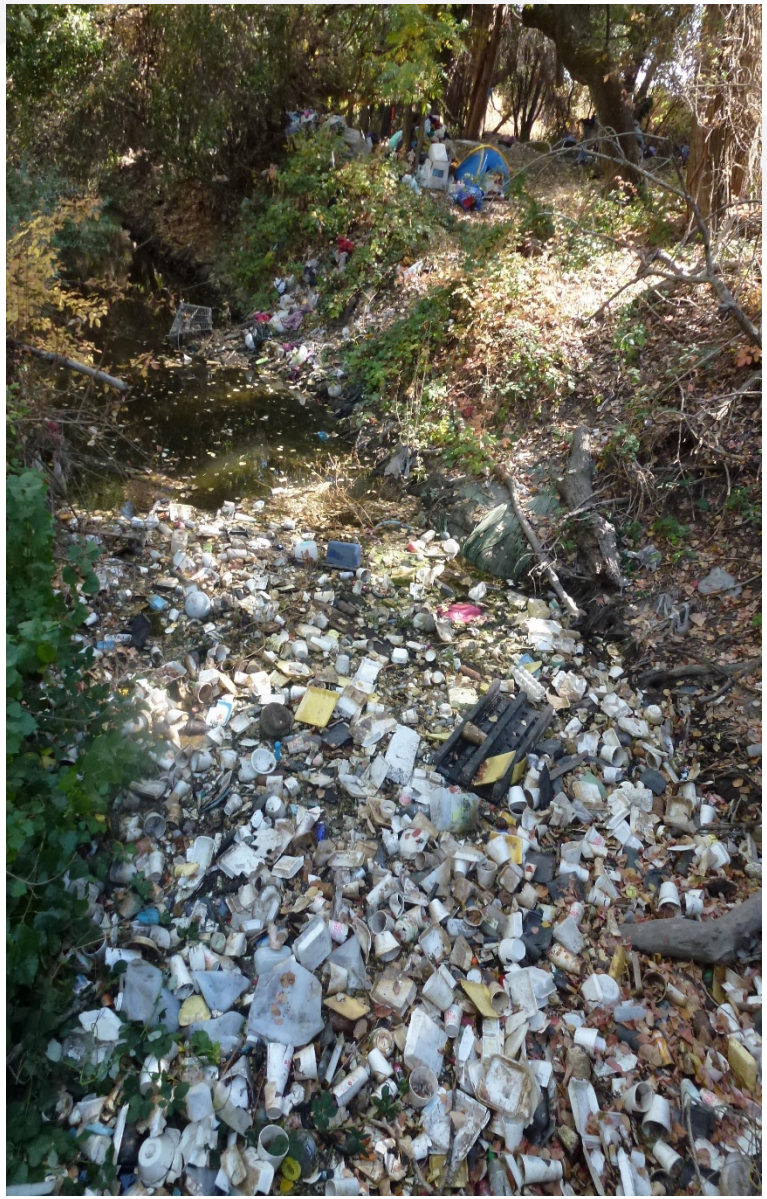
PLASTICS REMOVAL IN INDUSTRIAL STORMWATER

- Industrial facilities required to implement best management practices
  - To eliminate discharges of pre-production plastics
  - To reduce industrial stormwater pollutants to pollutant levels that protect receiving surface waters
- Forthcoming requirements proposed to include management of trash per statewide Trash Provisions

PLASTIC REMOVAL IN MUNICIPAL STORMWATER

Starting in early 2000s in Los Angeles Region:

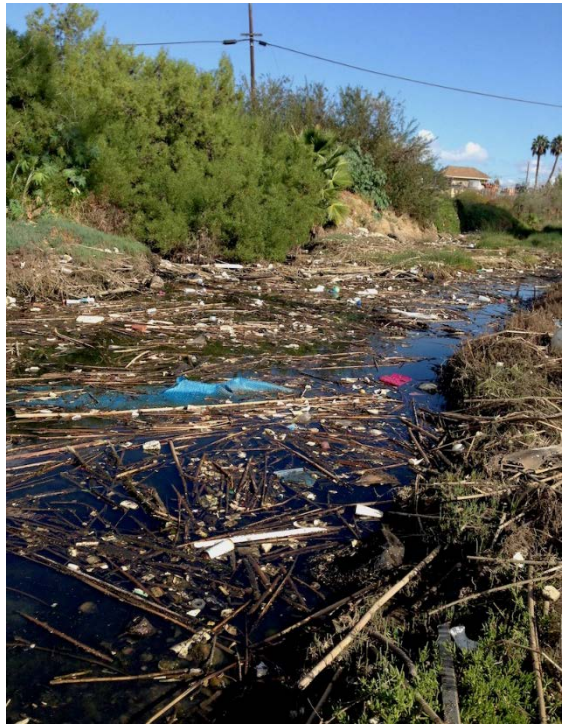
- Waterbody-specific trash regulatory requirements (Total Maximum Daily Loads) for 15 watersheds
  - Requirements to capture particles ≥ 5-mm from 1-year, 1–hour storms within urbanized watersheds
  - Most small particles are plastics
- Specific regulatory trash control requirements began to be implemented through municipal stormwater permits

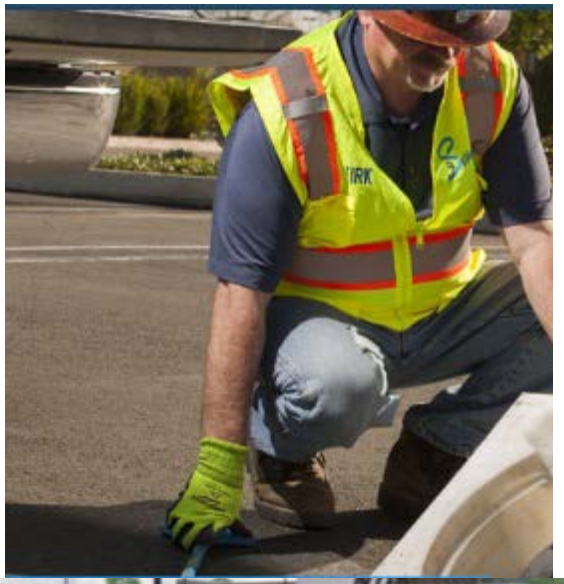


PLASTIC REMOVAL IN MUNICIPAL STORMWATER

Starting in 2002 in San Francisco Bay Region

- Further data collected on trash impairments
- 27 trash-impaired water bodies listed on Clean Water Act section 303(d) list
- Regulatory stormwater permits incorporated trash control requirements for capture of particles ≥ 5-mm from 1-year, 1–hour storms





2015
STATEWIDE TRASH PROVISIONS

- Implements a statewide trash prohibition with a 0% discharge goal by 2030
- Provides for all stormwater permits statewide to require capture of particles ≥5mm generated from 1-year, 1–hour storm events
- Applies to all regulated stormwater discharges to surface waters, including ocean
- Promotes full capture trash devices installed in stormwater conveyance systems

STATEWIDE TRASH CONTROLS FOCUS ON PRIORITY LAND USES WITH HIGH TRASH-GENERATING AREAS

- High-density residential areas of 10+ dwellings per acre
- Industrial land uses
- Commercial land uses
- Mixed urban land uses (combination of above)
- Public transportation stations
- Equivalent Alternative Land Uses

STATEWIDE TRASH IMPLEMENTATION
Successes as of 2019

Los Angeles Region

- Los Angeles River Watershed
  - Actual capture of over six million pounds of trash per year through 17,000 installed full capture systems
- Ballona Creek Watershed
  - Actual capture of over one million pounds of trash per year via 2,500 full capture systems

San Francisco Bay Region

- 90 percent permittee compliance with the 2020 goal of 80 percent trash reduction

IN SUMMARY

- Water Boards strive to achieve 100% trash reduction from high priority areas by 2030
- Water Board regulatory orders to continue upholding source control and trash removal from discharges
- Continued clean-up efforts in hot spot areas
- Continued collection of high-quality data and implementation of new technologies

REDUCING PLASTICS THROUGH TRASH CONTROL IN CALIFORNIA WATERS

Thank you on behalf of the
State Water Board, Division of Water Quality

Please visit our program websites at:

https://www.waterboards.ca.gov/water_issues/programs/trash_control

https://www.waterboards.ca.gov/water_issues/programs/stormwater/plasticdebris.shtml

https://www.waterboards.ca.gov/water_issues/programs/npdes/pretreat.html

THANK YOU

United States Contributions to Global Ocean Plastic Waste Meeting 2

Recording will be available on our website in a few weeks.