



SANTA CRUZ COUNTY “FILTER” SALES BAN: WHY LEAD WITH UPSTREAM SOLUTIONS

WHO WE ARE

The Law and Policy Partnership to End the Commercial Tobacco Epidemic (the Partnership) is a joint initiative of the American Lung Association and the Public Health Law Center to support tobacco control professionals in their work to end the commercial tobacco epidemic in California.

The Partnership provides free technical assistance, research, training, and analysis to help communities pass strong local tobacco ordinances that are both effective and legally sound.

LEGAL TECHNICAL ASSISTANCE

-  Legal Research
-  Policy Development, Implementation, Defense
-  Publications
-  Trainings
-  Direct Representation
-  Lobby

LAND ACKNOWLEDGMENT



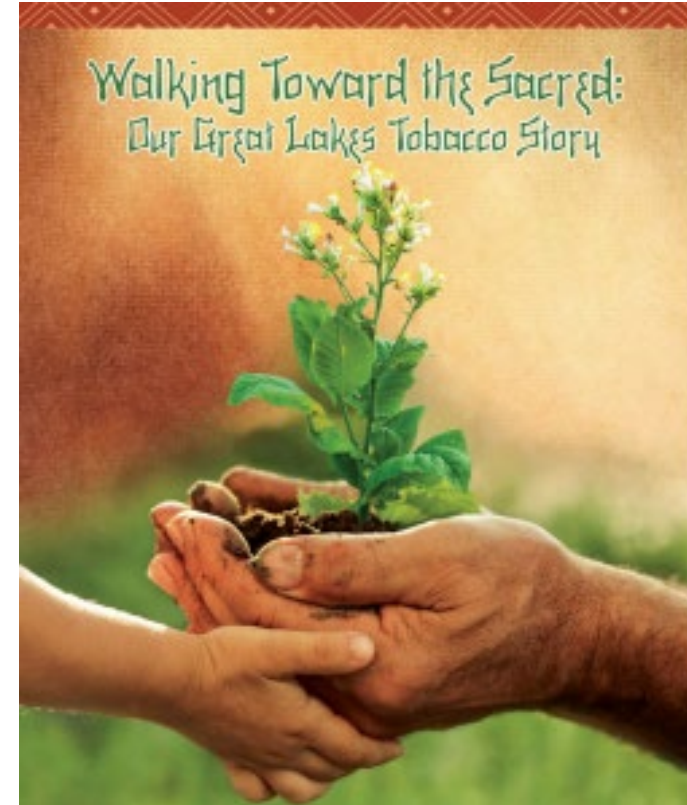
Photo Taken at Owamni Restaurant - Minneapolis, MN

RESPECTING TRADITIONAL TOBACCO



Tobacco traditions have been passed down for generations. Tobacco plants are considered a sacred medicine for many Indigenous people.

<https://keepitsacred.itcml.org/>



<https://www.glitc.org/publications/walking-toward-the-sacred-our-great-lakes-tobacco-story/>

AGENDA:

PART 1: (LAST WEEK)

PART 2: (TODAY)

1. Brief recap of Part 1
2. An enormous plastic microfiber problem
 - Research findings on the frequency of microfiber release
3. An expensive and unnecessary contaminant
 - History of the tobacco industry's "filter" fraud
 - Quantifying the massive cost of cigarette butt waste
 - Upstream policies are indispensable to solving this problem
4. Q&A

TODAY'S SPEAKERS



John D. Atkinson, PhD

State University of New York at Buffalo,
Associate Professor

Scott & Coleen Stevens Chair in
Engineering Sustainability



Thomas E. Novotny, MD MPH DSc (hon)

San Diego State University, School of Public
Health. Professor Emeritus

Center for Tobacco and the Environment, Co-
Director

PART 1 RECAP

LOCAL BAN ON SALE OF “FILTERED” CIGARETTES

- Santa Cruz County – Jan 2027
 - Bans sale of “partially inconsumable cigarettes/cigars”
 - Contingent on similar policy adoption by two of its municipalities
- City of Santa Cruz – Jan 2027
- City of Capitola – June 2027



PARTIALLY INCONSUMABLE CIGARETTES/CIGARS

- Language matters
- Comprehensive policy
- No industry terms
 - “filter”
 - “disposable”
 - “biodegradable”
- Filter fraud/deception
- Avoids Greenwashing



UPSTREAM SOLUTIONS SANTA CRUZ COUNTY SALES RESTRICTION

- **First of its kind!!!**
- Cutting waste at the source
- Addresses largest source of litter
- Data supported
- Community backed
- Facilitates compliance with Clean Water Act Trash Amendments
- Puts financial burden back on the tobacco industry



NO HARMLESS END TO PRODUCT LIFE CYCLE

Cigarette butts are turned into mosquito repellent and stuffing for soft toys at this Indian factory

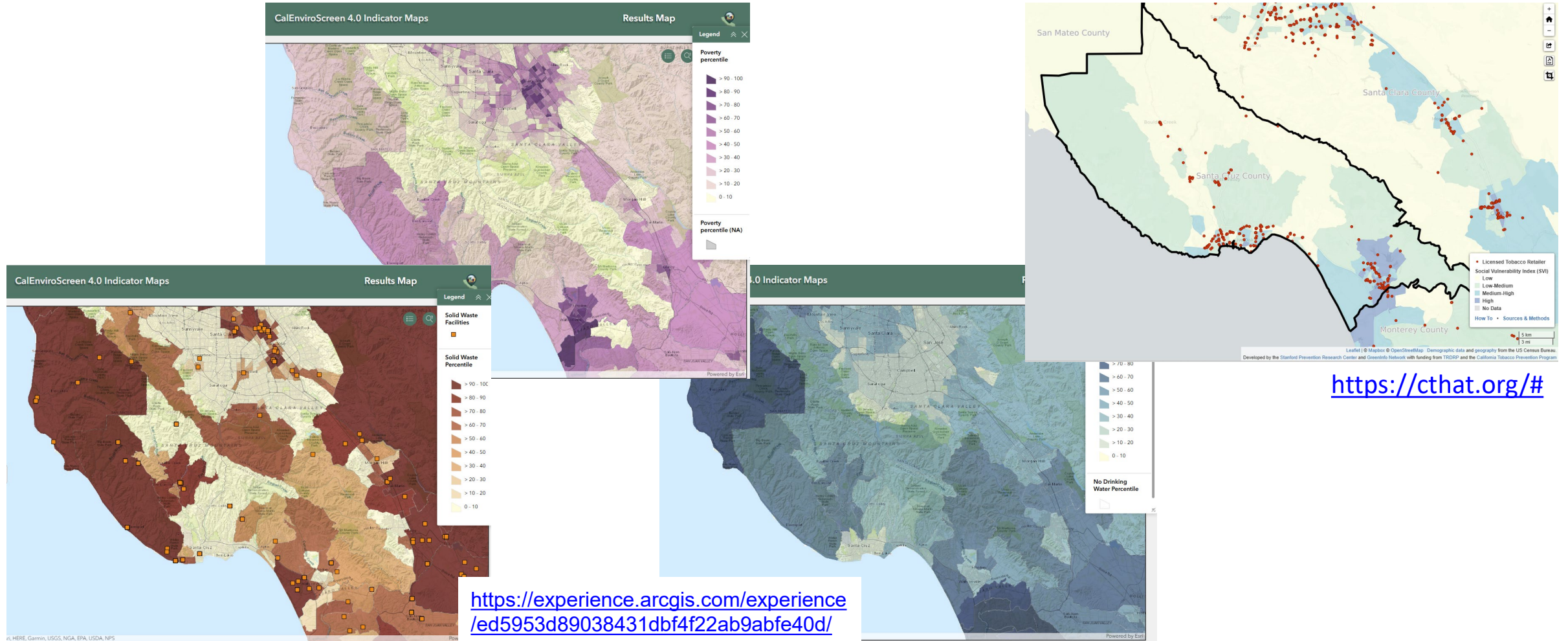


Source: [Cigarette butts are turned into mosquito repellent and stuffing for soft toys at this Indian factory | Euronews](#)



Source: [chicagotribune.com](#)

ENVIRONMENTAL INJUSTICE AND WASTE



RESEARCHING THE EXTENT OF THE PROBLEM

Cellulose Acetate Microfiber Release from Cigarette Filters in Agitated Water

Santa Cruz County “Filter” Sales Ban Webinar Series – Part 2 | Public Health Law Center | 10 Feb 2026

John D. Atkinson, PhD

Stevens Chair in Engineering Sustainability & Associate Professor, University at Buffalo





Initiative for Plastics Recycling Research and Innovation



Task 3

Research plastics in
natural environments
(micro/nano plastics)



WANT TO REDUCE MICROFIBERS?

6 Simple tips to help reduce
microfiber pollution:



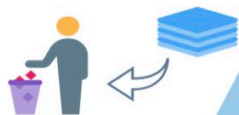
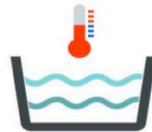
Wash clothing less often.
This is perhaps the simplest
and most effective method
for reducing microfiber
pollution.

Only wash full loads of laundry.
This results in less friction
between clothes and reduces
shedding of synthetic fibers.



**Use microfiber-catching devices
when you do the laundry.**
Several technologies are
available for purchase, including
special wash bags and laundry
balls designed to trap
microfibers.

**Wash laundry with cold water
for a shorter period of time.**
Studies have found that
switching to a colder and shorter
cycle can dramatically reduce
microfiber shedding.



**Install an external microfiber
filter on your washing machine
and dispose of captured
microfibers in the trash.**
There are several commercially
available external lint filters to
choose from.

**Use a front-loading washer,
if possible.**
Top-load washing
machines tend to produce
more microfibers than front-
loading machines.



Google AI for “Microfiber Pollution”

Microfiber Pollution consists of tiny synthetic strands (polyester, nylon, acrylic) shred from textiles during washing, drying, and wearing ...

15 Ways to Stop Microfiber Pollution Now

March 02, 2017

Plastic Pollution Coalition



National Park Service

ARTICLE

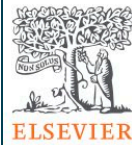
Reducing Laundry Microfibers



University at Buffalo

Department of Civil, Structural
and Environmental Engineering
School of Engineering and Applied Sciences





Journal of Hazardous Materials: Plastics

Volume 2, February 2026, 100036



Cellulose acetate microfiber release from cigarette filters in agitated water

Ghazal Vasseghi, John D. Atkinson  

NEWS

Cigarette filters are an 'underestimated' source of microplastic pollution, study claims

 Editor  6 hours ago  0  4 mins

HEALTH

Surprising new way cigarettes are harmful — and not just to smokers

By Reda Wigle

Published Jan. 23, 2026, 10:26 a.m. ET

 39 Comments

How water turns cigarette butts into a microplastic nightmare



By **Eric Ralls**
Earth.com staff writer

Cigarette Butts as a Microfiber Source

Most Littered Item

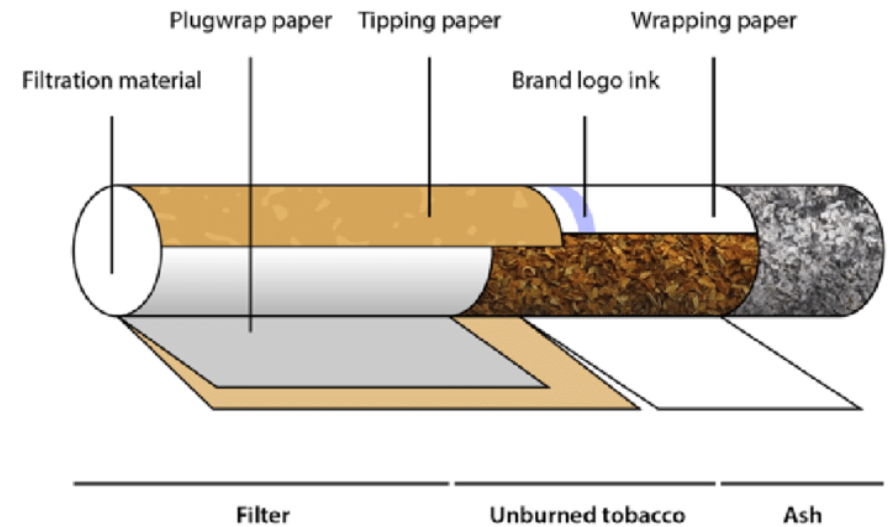
- ~ **4.5 trillion** cigarette butts littered each year
- Filters constructed of > **10,000** cellulose acetate (CA) fibers

Toxicity

- Cigarette smoke contains > **7,000** chemicals e.g., heavy metals, PAHs, and other aromatic hydrocarbons

Project Objectives

- Provide a first look at macro-to-micro pollution effects associated with microfiber (MF) release from littered CBs



Poppendieck et al., 2016

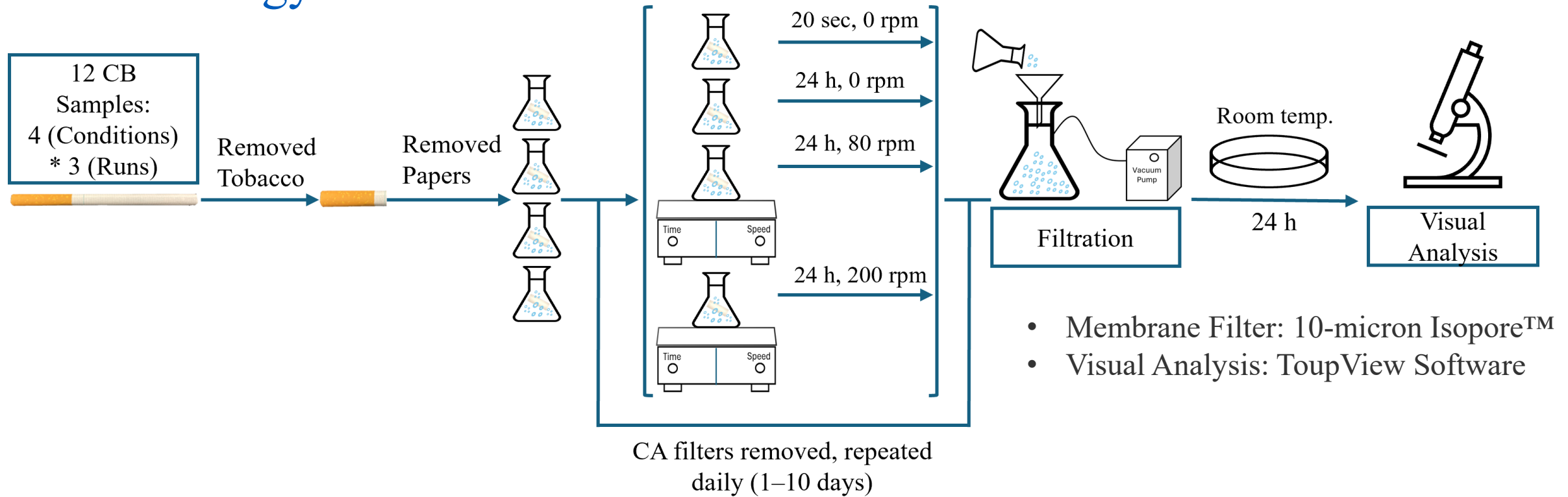
(NOAA, 2024)

(Dobaradaran, Schmidt et al. 2019)

(Torkashvand, Farzadkia et al. 2020)

(Belzagui, Buscio et al. 2021)

Methodology



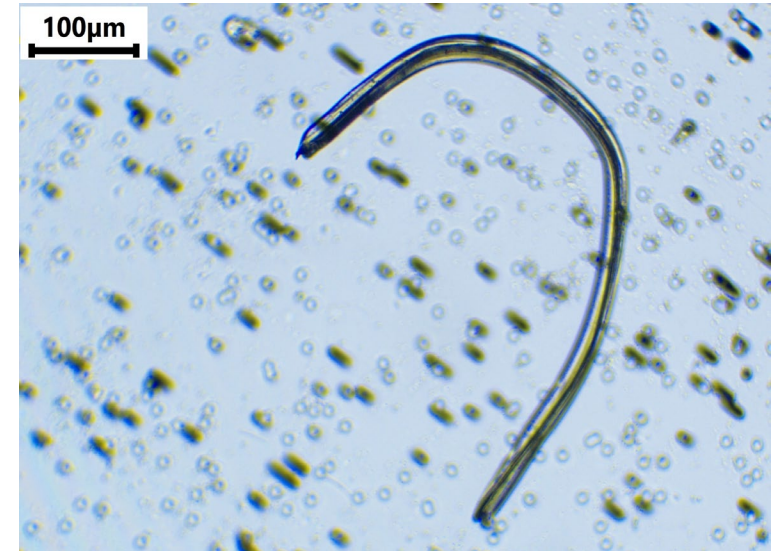
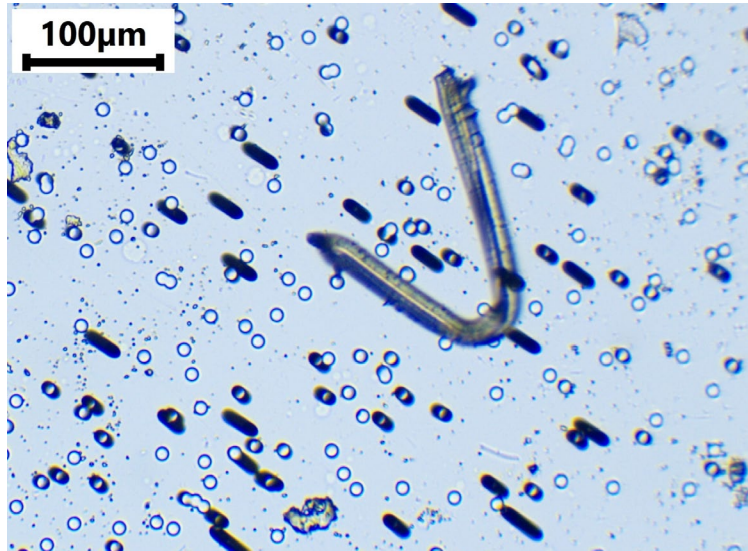
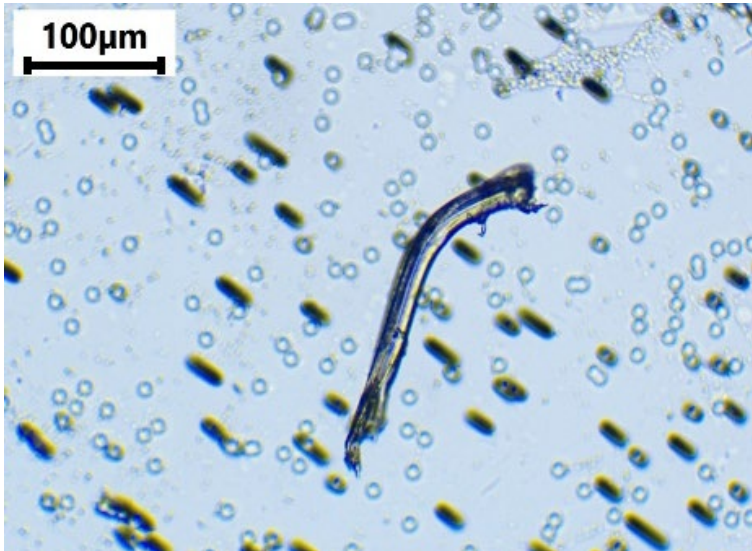
Quality Assurance & Control:

- Blank sample prepared for each sampling event
- Wear low shed lab coats, hair tied back
- Experiments run in triplicate

Microfiber Images

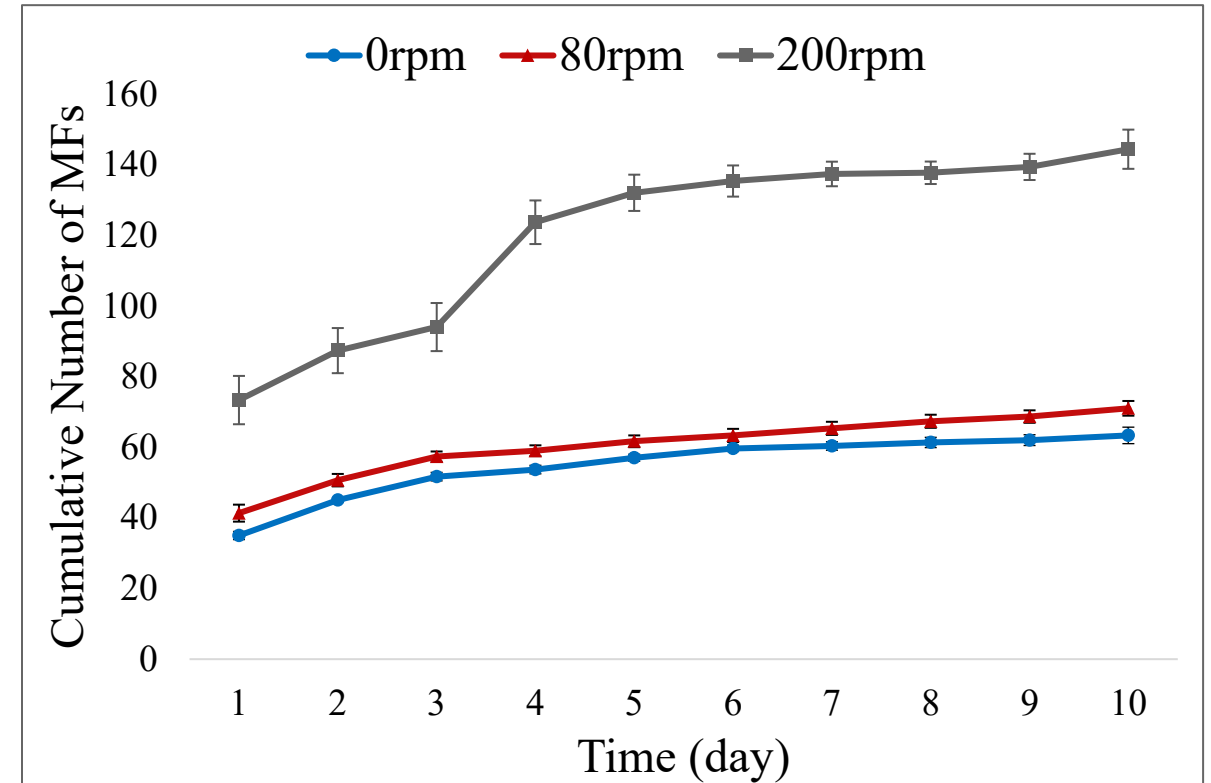
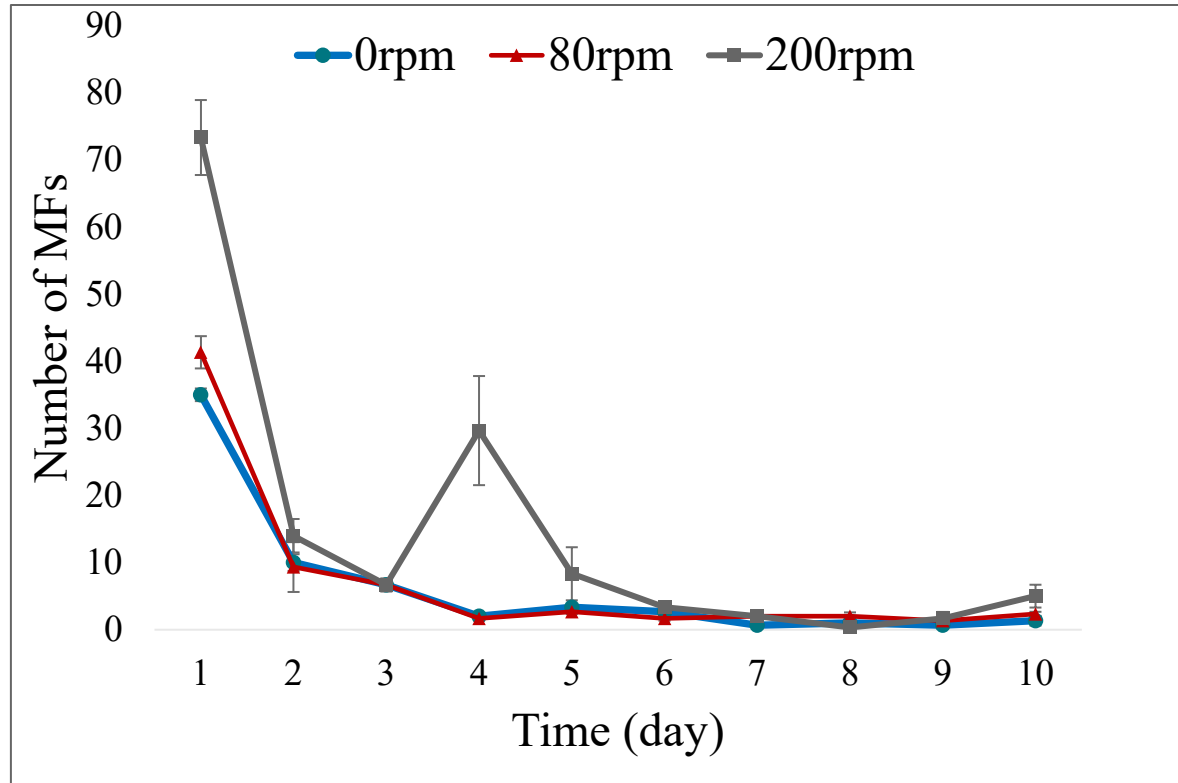
Results

Microfibers released from cigarette filters.



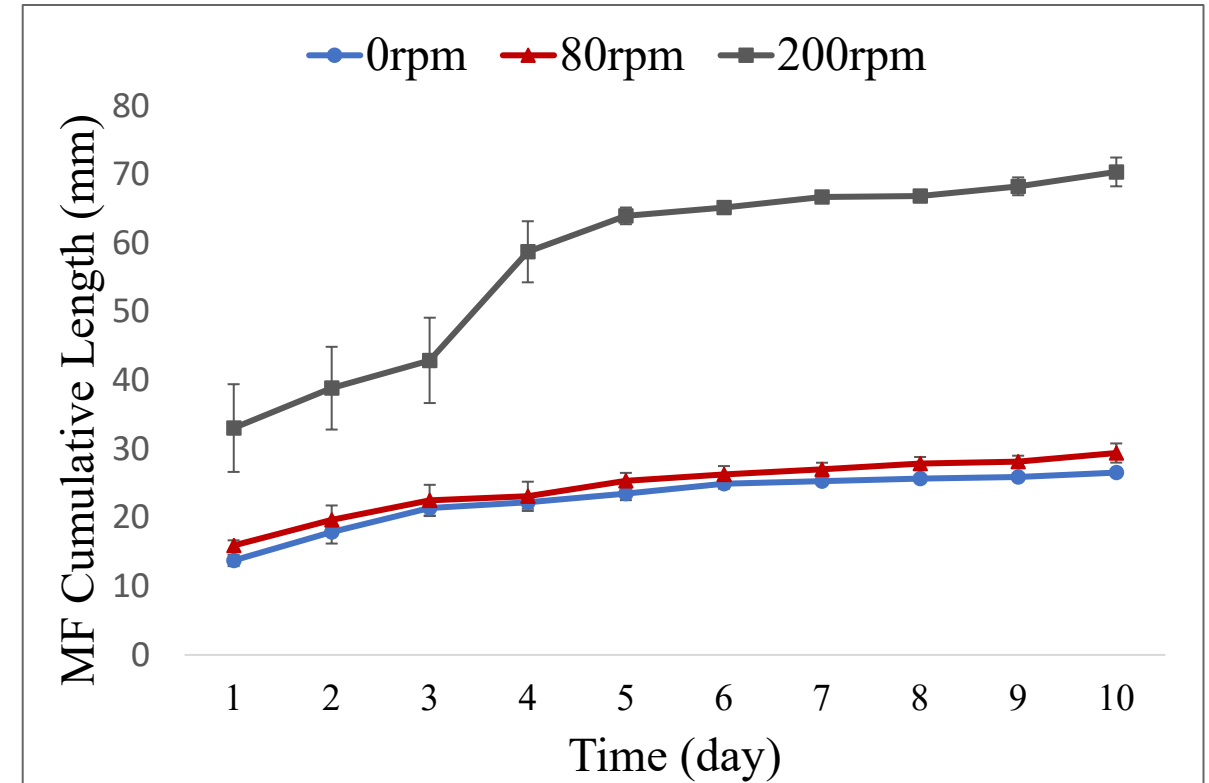
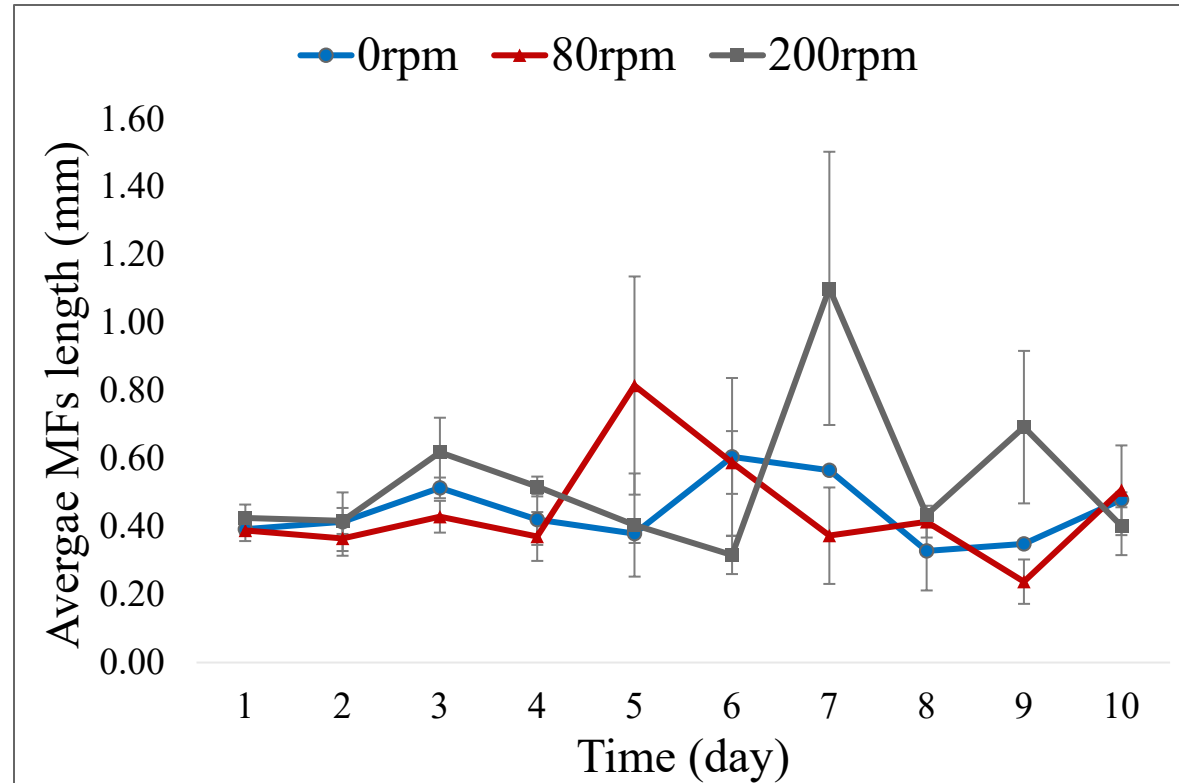
Immediate release (20 sec): 24 ± 4 microfibers/filter upon water contact

Microfiber Count Data

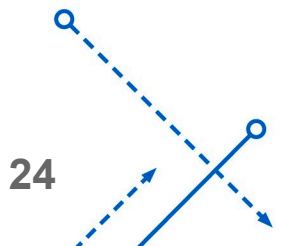


- **Day 1:** 35 ± 2 (0 rpm), 41 ± 4 (80 rpm), 73 ± 10 (200 rpm)
- **10-day Cumulative Count:** 63 (0 rpm), 71 (80 rpm), 144 (200 rpm)
- **Regression Model**
 - 200 rpm agitation increases MFs release by **~69%** ($p < 0.001$)
 - Release is highest on **Day 1** and declines by **~71%** over the 10-day ($p < 0.00001$)

Microfiber Length Data



- **Fiber length:** 445–533 μm avg; 35–3028 μm range
- **10-day Cumulative Length:** 3 cm (0 and 80 rpm), 7 cm (200 rpm) $\longrightarrow$ Filter Size $\sim$ 2.5 cm



Environmental Release Modeling

Data	Source	Detail
Population	U.S. Census (2024)	County-Level
Adult %	Census estimate	80%
Smoking rate	NYS Dept. of Health (2021)	County-Level
Cigarettes/day	NYS Tobacco Use (2008)	Average = 11/day
Improper littering	Literature/Assumption	Low = 45%, Medium = 65%, High = 85%
Cigarette Butts in Aquatic Env.	Literature/Assumption	Low = 20%, Medium = 50%, High = 80%
MF Release by Agitation/CB/day	Lab experiment	2 scenarios: Low = 38, High =73



First Day Microfiber Release in the NYS Water

Lowest

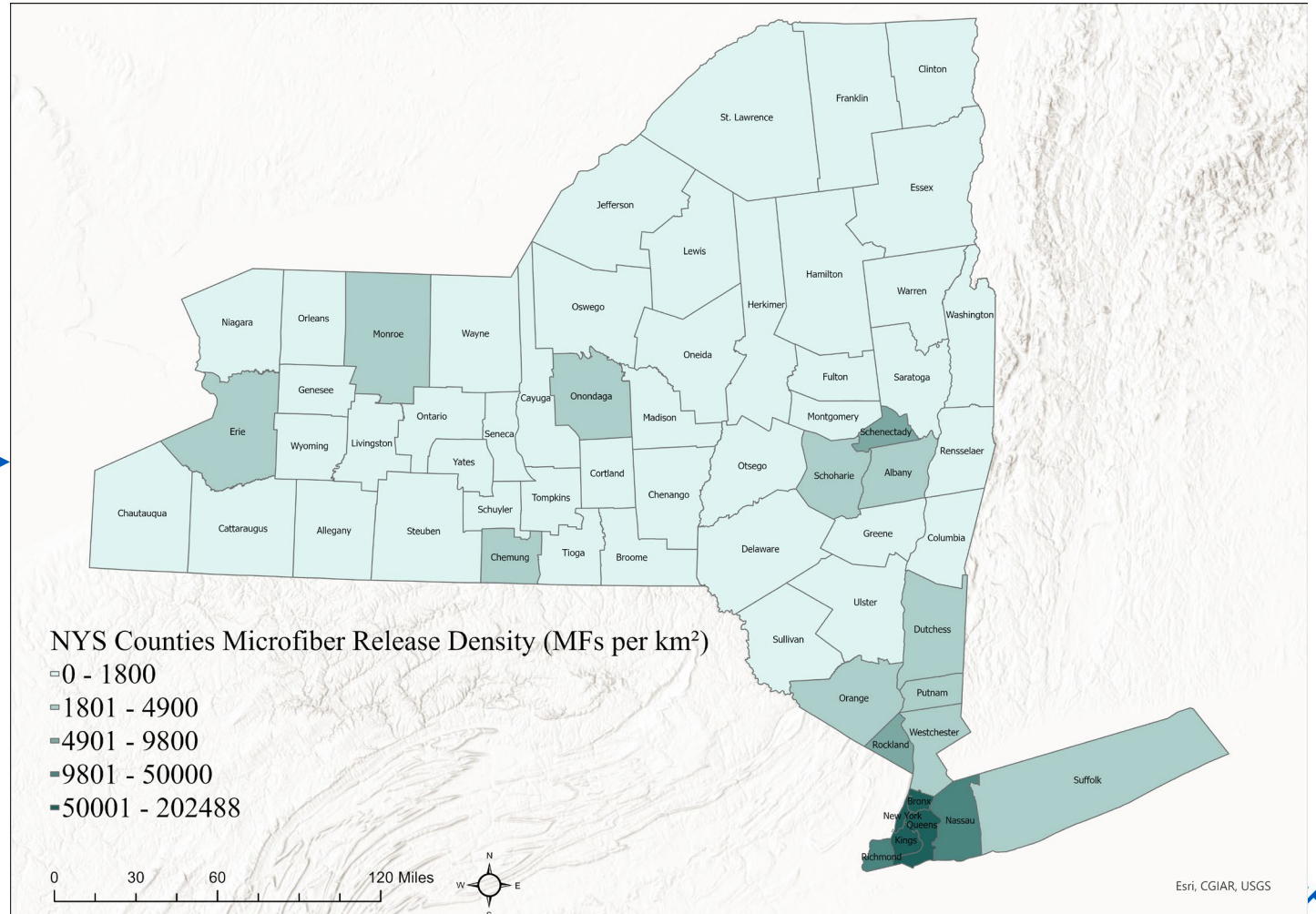
Littering = 45 %
Aquatic Entry = 20 %
71 Million MF/day

Baseline

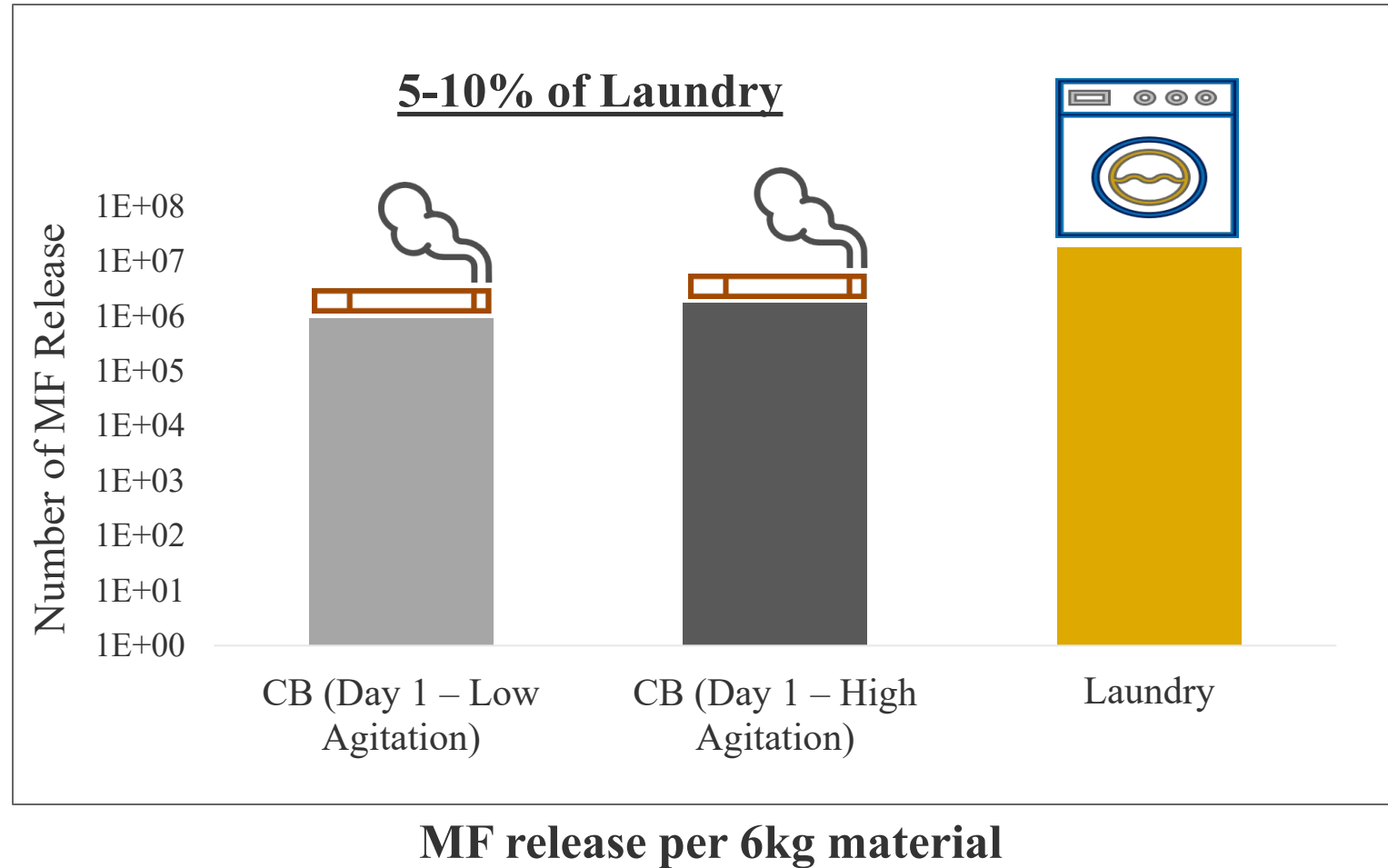
Littering = 65 %
Aquatic Entry = 50 %
258 Million MF/day

Highest

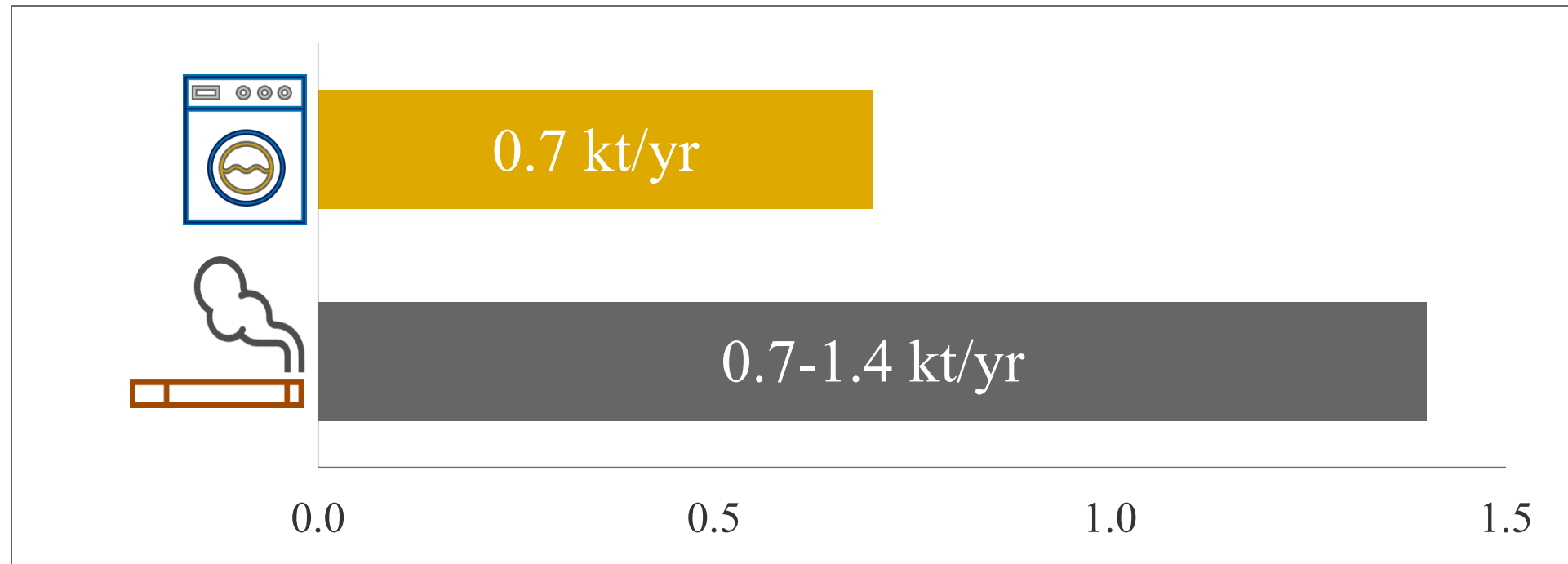
Littering = 85 %
Aquatic Entry = 80 %
1 Billion MF/day



Microfiber Release, Comparisons to Laundry



Microfiber Release, Comparisons to Laundry



Potential Annual Microfiber Input to NYS Water (kt/yr):

If **ALL** filter microfibers enter aquatic environments in one year.



University at Buffalo

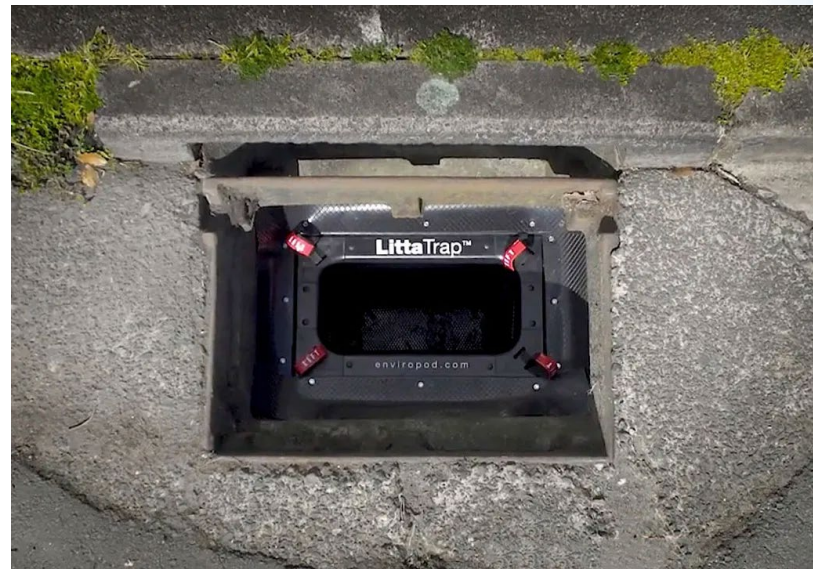
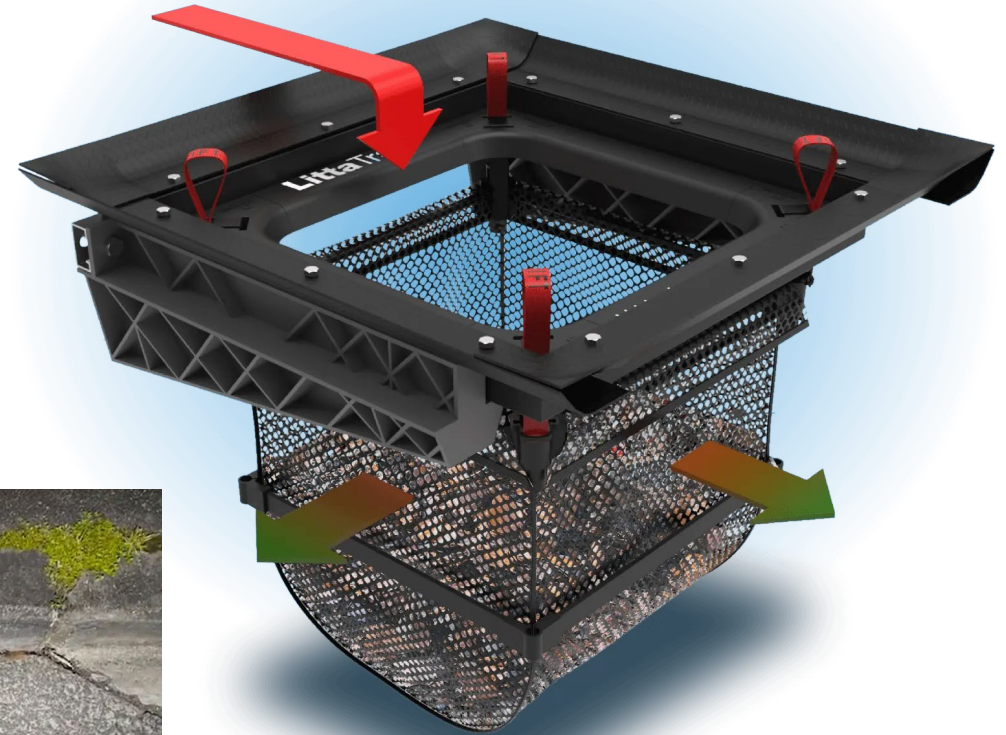
Department of Civil, Structural
and Environmental Engineering
School of Engineering and Applied Sciences

Community Action for Stormwater Clean-Up and Debris Elimination



Marine Debris Program

Office of Response and Restoration
National Oceanic and Atmospheric Administration



Enviropod

Storm Drains as a Sink for Tobacco Waste

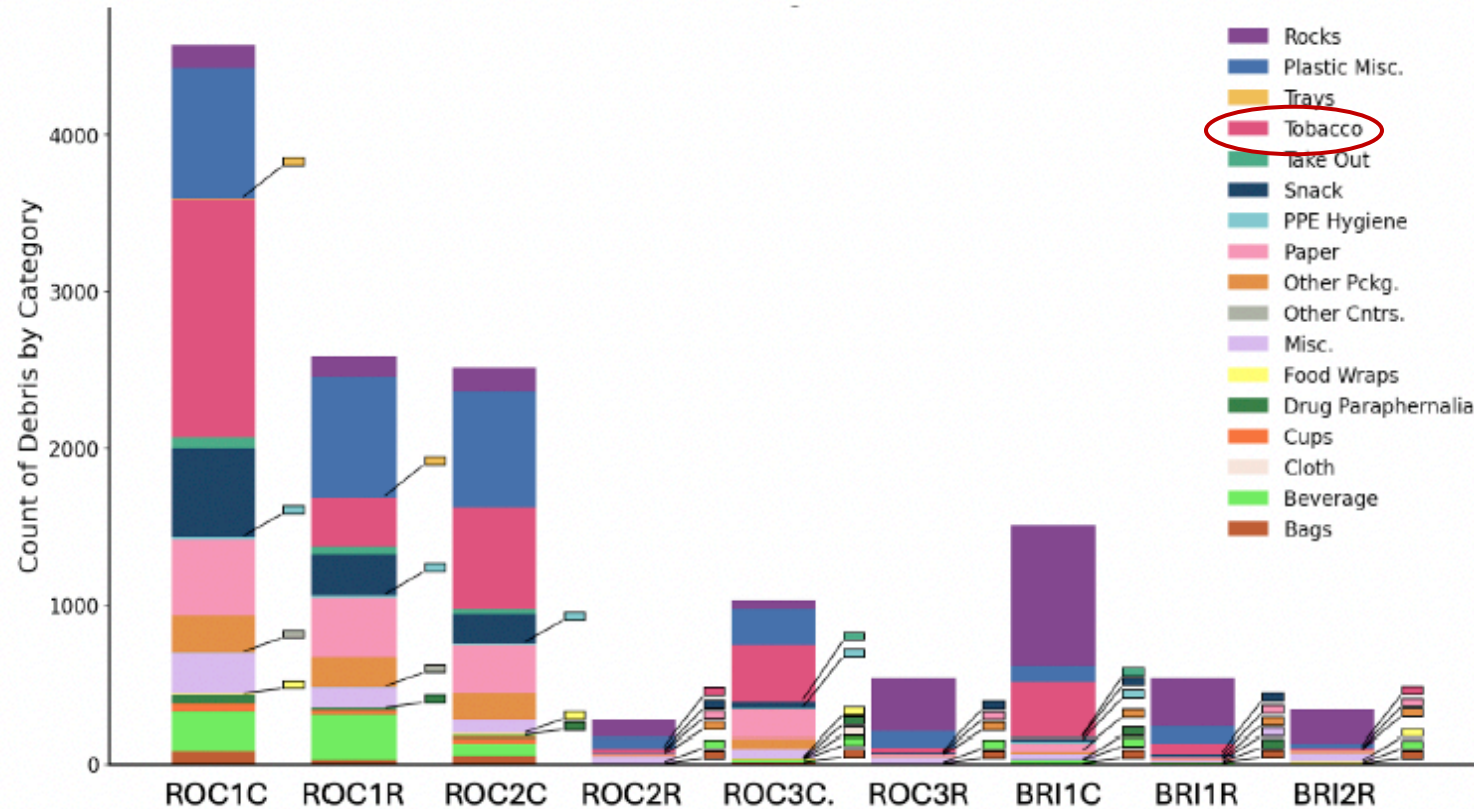


Figure 2.14: Total debris by count of category across all samples at every site summed over the two year sampling period.

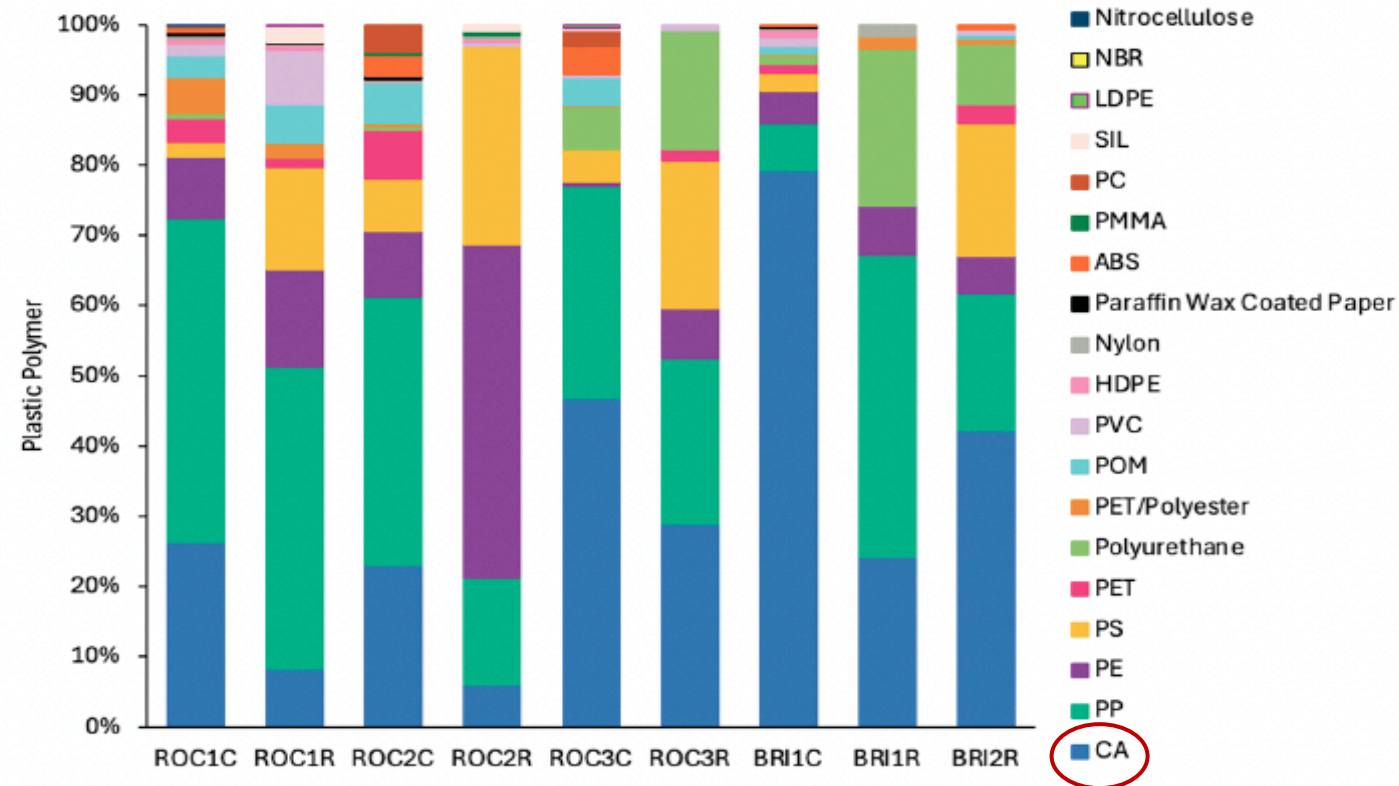


Figure 2.11: Percent composition of plastic polymers based on count at each site. NBR-Nitrile Butadiene Rubber, LDPE-Low Density Polyethylene, SIL- Silicone, PC-Polycarbonate, PMMA- Polymethyl Methacrylate, ABS- Acrylonitrile butadiene styrene, HDPE- High Density Polyethylene, PVC- Polyvinyl chloride, POM- Polyoxymethylene, PET/ Polyester- Polyethylene Terephthalate/ Polyester, PET- Polyethylene Terephthalate, PS-Polystyrene, PE-Polyethylene, PP-Polypropylene, CA-Cellulose Acetate.

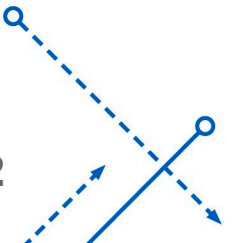


Thank You!

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It's Bigger than We Think



Banning Cigarette Filters It's About the Environment

Thomas E. Novotny MD MPH

San Diego State University Center for Tobacco and the Environment

February 10, 2026

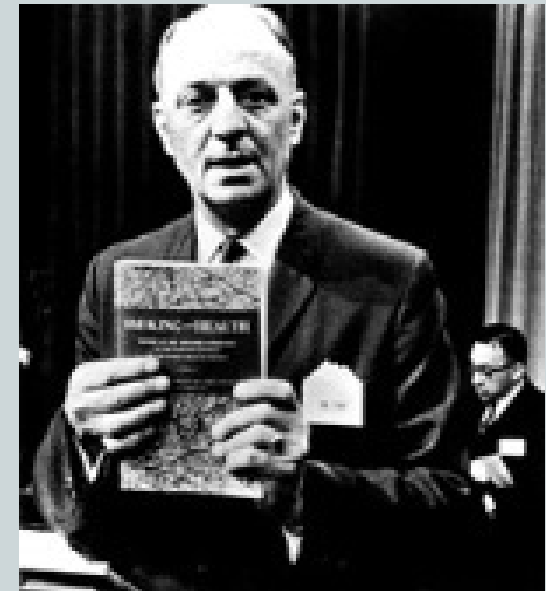
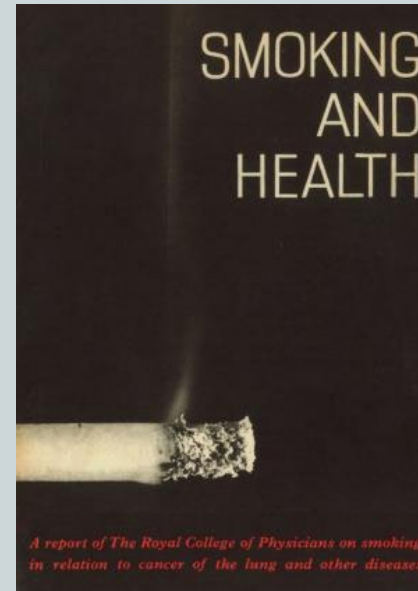
History of Filters

- 1860's—to keep tobacco bits out of mouth
- 1930's-1940's—protect against 'poisons' (nicotine)
 - Paper, wool, cotton
 - Silica, cellulose, porcelain
- 1936--First commercial filter: Viceroy
- 1940s-1950s--First health concerns led to increased research to get 'safe' cigarette
- 1950s researchers and industry identified carcinogens in tobacco—no industry reports
- 1951—1% cigarettes filtered; 1958—50% filtered
- 1952-1958: Kent Micronite Filter (made of asbestos)



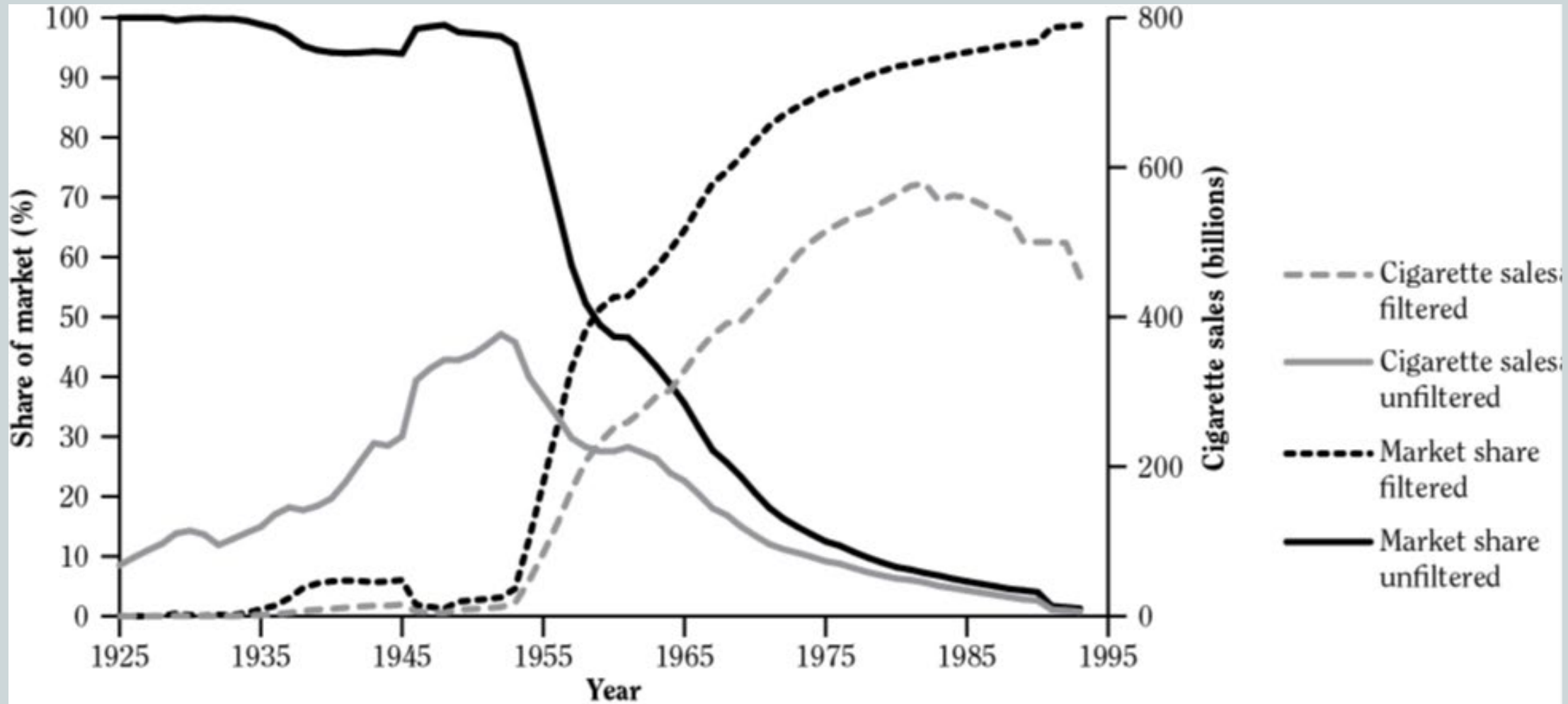
The 'Health Scare'

- 1962 *Royal College of Physicians (UK) Report: Smoking and lung cancer linkage*
- 1965 US Surgeon General's *Report on the Health Consequences of Smoking* in 1965: lung cancer, laryngeal cancer, chronic bronchitis, cardiovascular disease.



Surgeon General Luther Terry, 1965

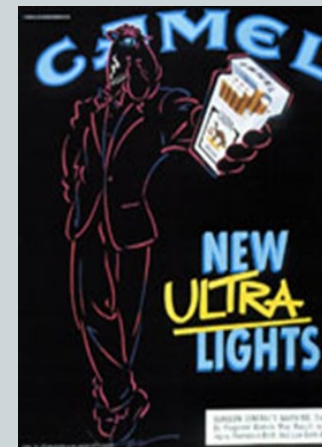
Market share and total annual cigarette sales of filtered and unfiltered cigarettes in the United States, 1925–1993



In 2020, 98.8% of Commercial Cigarettes Sold in California are Filtered (FTC)

Robert Proctor's *Golden Holocaust*: 'The Filter Flim Flam'

- Main purpose of the cigarette filter for tobacco industry:
 - to lower the cost of manufacturing (cellulose acetate is cheaper than tobacco leaf);
 - to keep tobacco bits from entering the mouths of smokers (probably the principal reason people had used cigarette holders in the past); and
 - to convince people into thinking that filtered brands were somehow 'safer' than unfiltered brands.



Anatomy of the Filter

- By the 1950s, cellulose acetate was most common type filter
 - Manufactured by chemical companies (Eastman, Dow)
 - Charcoal and flavor beads added to some;
- Plant based acetylated polymer;
- 12-15,000 strands form 'tow';
- Combined with plasticizer.
- *Degradability*: Somewhat photodegradable, poorly biodegradable, breaks up into small pieces as microplastic waste;
- 10-year environmental persistence;
- *Biodegradability*: ten year effort among multiple companies yielded no marketable product;
- *Recycling*: construction material, complicated logistics, no evaluation;
- *Other problems*: Filter fallout-- cellulose acetate fibers found in lungs of smokers.

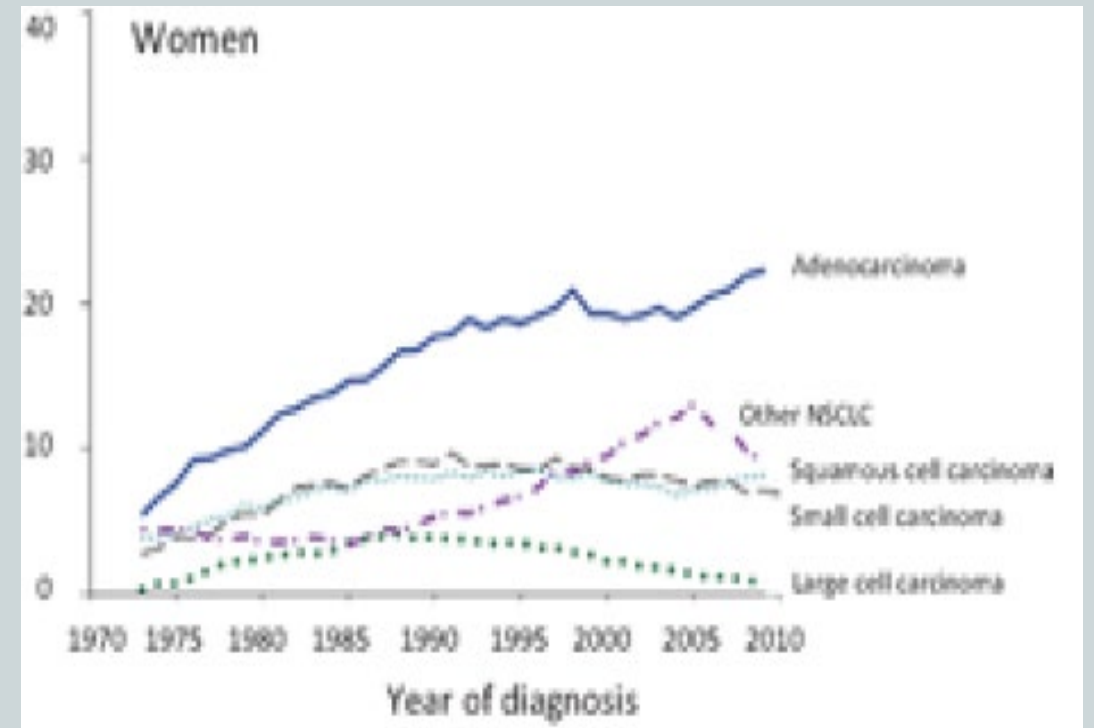
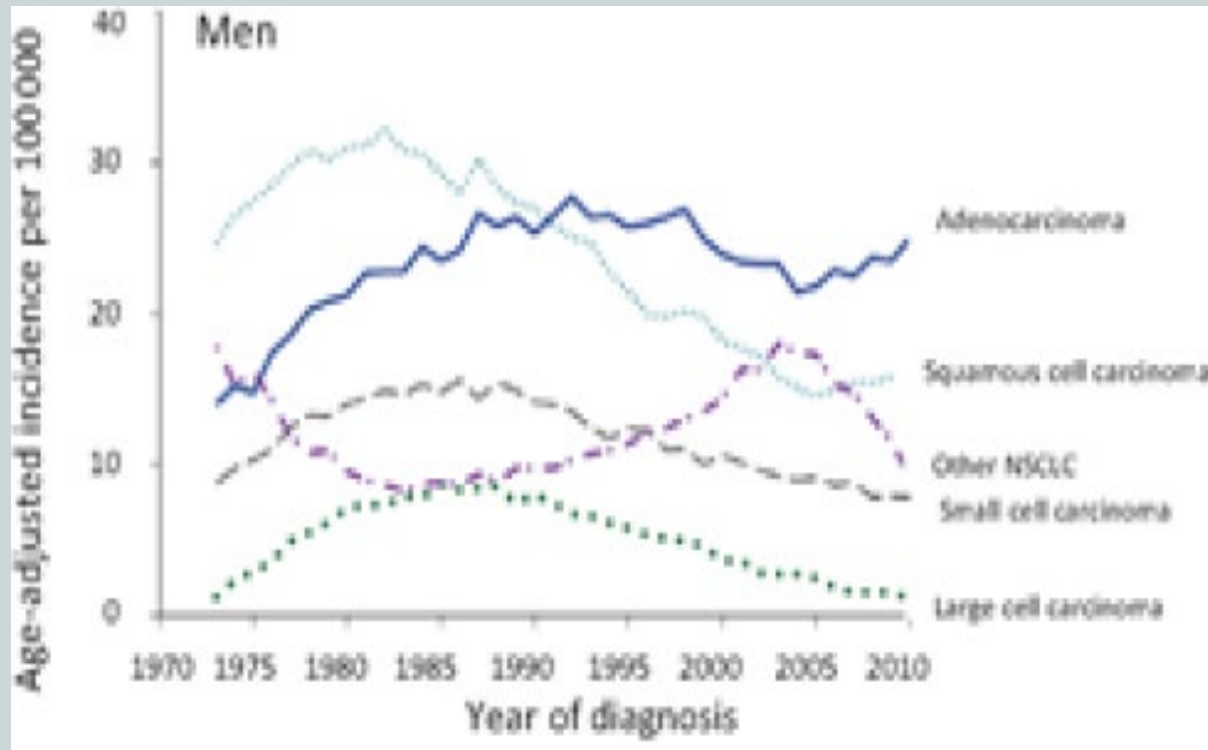


The Ventilated Filter

- Easier to draw deeply into lungs—increases risk of adenocarcinoma;
- Machine measured tar and nicotine levels are reduced by filters but reduction provides no health protection
 - Blocking ventilation allows compensatory smoking to maintain nicotine and toxin levels;
- Fraudulent marketing tool: no health protection;
- Advertising of light and low tar now banned by Tobacco Control Act.



Lung Adenocarcinoma Incidence Increases, 1970-2010



Source: Song et al., J Nat Cancer Institute 2017

The Environmental Burden of Discarded Cigarette Butts

GLOBAL ESTIMATE DISCARDED BUTTS

A PLASTIC PROBLEM

- **33-75%** of filtered cigarettes smoked may be discarded into environment;
- Global cigarette sales (2020) **4.78 trillion**
 - >90% are filtered with cellulose acetate;
 - Excludes illicit cigarettes: 1 in 7 packs sold in LMICs are illicit;
- Global cig butt burden: **1.58-3.59 trillion**;
- Global microplastic burden: **143,100 to 323,100 MT**
 - Filter = 0.14 gm.



Environmental Impact of Filters

- Each filter releases ~100 plastic microfibers/day (<0.2 mm);
- Toxic to water fleas, frogs, worms, fish, mollusks;
- Changes diversity of microbial communities;
- Green et al., “Cigarette butts have adverse effects on initial growth of perennial ryegrass and white clover,” *Ecotoxicology and Environmental Safety*, 2019
- San Francisco Estuary Institute urban water runoff study: cellulose acetate predominant fiber found;
- Evidence for bioaccumulation in shellfish, rainbow trout;
- Evidence for toxicity after accidental ingestion by humans and pets.



Top Ten Items Picked Up Over 30 Years of Coastal Cleanups

Item rank	Item	No. of Debris Items	Percentage of Total Debris Items
1	cigarettes/filters	52,907,756	32%
2	food wrappers/containers	14,766,533	9%
3	caps, lids	13,585,425	8%
4	cups, plates, forks, knives, spoons	10,112,038	6%
5	beverage bottles (plastic)	9,549,156	6%
6	bags (plastic)	7,825,319	5%
7	beverage bottles (glass)	7,062,199	4%
8	beverage cans	6,753,260	4%
9	straws/stirrers	6,263,453	4%
10	rope	3,251,948	2%
Top ten total debris items		132,077,087	80%
Total debris items worldwide		166,144,420	100%

Source: Ocean Conservancy

A blight on streets, parks and beaches



Millions of butts are collected in parks, beaches, and community cleanups

Modeling the Economic Costs of TPW: Direct Costs

- **Manual Cleanup Costs (Public Costs)**
 - Statistical model using Census Bureau and epi data for specific city;
 - Sales data and estimated proportion discarded as needing manual cleanup.
- **Private Sector Cleanup Costs (person-hours)**
 - Reported by voluntary groups;
 - Reported by businesses.
- **System Costs if available**
 - Waste management systems TPW proportion;
 - Landfill TPW proportion of waste;
 - Waste water system TPW proportion;
- **Prevention Costs**
 - Outdoor smoking ban costs;
 - TPW advocacy campaigns;
 - Enforcement costs.



Economic Costs of TPW: Secondary Costs

- **Most TPW is not collected and is thus *unmitigated*:**

- International Coastal Cleanup picks up about 1 million butts each year (out of 5.6 trillion sold);
- Cellulose acetate filters persist for up to 10 years, and they break down into microplastics;
- Cigarette butts are the most commonly collected trash item in the world.

- **Likely to be substantial**

- Ecosystem Services (those things we gain from intact ecosystems—food, outdoor recreation, economic benefits;
- Chemical pollution: long term contamination by tobacco toxins: carcinogens, metals, etc.;
- Plastic pollution due to discarded filters;
- Neighborhood degradation and quality of life.



Implications for Policy and Practice

- **Clean ups, anti-litter laws, anti-litter campaigns** will not substantially reduce TPW
- **Policy options:**
 - Add 'litter fees' to price of tobacco products: reduce consumption and fund programs
 - Prohibit smoking in outdoor public spaces: de-normalize smoking and reduce local TPW burdens
 - Restrict sales of tobacco products:
 - Ban single use disposable vapes and require hazardous waste law application to e-cigarette components (including package warnings);
 - Reduce distributor density;
 - ***Ban sales of filtered cigarettes.***



Knowledge Gap on Utility and Composition of the Commercial Cigarette Filter

- National Panel Survey (*Tob Control* 2021): 33.2% of smokers, 21.3% of non-smokers believed filters reduce harmful effects of smoking, and 28.9% knew filters were plastic;
- Young adult survey (*J Adolescent Health* 2021): 89% thought filters harmful to environment, and 43% knew they were plastic;
- Philip Morris smoker survey: 13% thought filters were plastic (59% thought cotton), and 25% thought tossing butts was the correct way to dispose of them;
- ITC smoker survey in four countries (*Nic Tob Res* 2025): 45.9% believe removing filters will make cigarettes much more harmful, 28.6% a little more harmful, 15.3% unsure, 10.2% not more harmful. Believing that removing filters makes cigarettes much more harmful was strongly associated with opposing a filter ban.

PMI Launches “Our World Is Not an Ashtray” Initiative

Aims to Halve Plastic Litter from Products by 2025*

- 25% of adult smokers reported they throw butts on the ground because they “think it is a normal way to dispose of a cigarette.”
- 75% thought that cigarette filters are made of cotton or paper; 15% thought made of plastic
- Working with NGOs again: — Litterati, Cortexia, and CARTO to mobilize ‘volunteers’
- Make cigarette butt littering socially unacceptable
- Increase scale and reach of volunteer participation in clean-up activities.
- “Nudge smokers to more responsible disposal habits, launching general population education programs, and cooperating with governments and local authorities to ensure there is an adequate waste disposal infrastructure.”

DOWNSTREAM APPROACHES!



**Business Wire July 16, 2020*

Biodegradable/recyclable filters are not a viable solution

RECYCLING BUTTS

- Requires extensive infrastructure: technical, transport, safe handling, hazard regulation;
- Products not economically viable: bricks, pallets, pipe coatings;
- ‘Circular economy’ not possible for tobacco products.

BIODEGRADABLE FILTERS

- Industry studied and gave up on biodegradable filters in 2000s: non-plastic filters unmarketable;
- Tech industry: New greenwashing partners, “Dedicated To Solving The Global Problem Of Cigarette Butt Pollution” (*Greenbutts*);
- Biodegradable filter allows ‘guilt-free littering’ and continued butt toxicity.

Regulatory options to prevent environmental harm and pollution across the tobacco product life cycle

Regulatory options to prevent environmental harm and pollution across the tobacco product life cycle



A straightforward way to eliminate the most common type of TPW would be to ban the manufacturing (where relevant), import, distribution and sales of cigarettes with filters.

Banning ... single-use plastic-containing tobacco products, and plastic accessories...



Page 47, Paragraph 2

(1) <https://storage.googleapis.com/who-fctc-cop11-source/Supplementary%20documents/fctc-cop11-sup-inf-9-regulatory-options-to-prevent-environmental-harm-and-pollution-across-the-tobacco-product-life-cycle.pdf>

Baltimore City Lawsuit—Extended Producer Liability

- To hold five cigarette manufacturers and a distributor legally accountable for TPW cleanup and environmental damages:
 - Cleanup costs;
 - ***Defective product***
 - ***Failure to warn***
 - ***Public nuisance...***



Mr. Trashwheels:
collected 12 million butts
from Baltimore's Inner
Harbor since 2014

Conclusions

- Cellulose acetate filters are a source of widespread plastic, toxic waste pollution;
- There are significant knowledge gaps about the function and composition of commercial cigarette filters;
- The cellulose acetate filter is a fraudulent marketing tool that facilitates smoking and may discourage quitting; it has increased risks for lung adenocarcinoma;
- Joining environmental advocacy with tobacco control strategies to improve public knowledge about cigarette filter.
- Banning the sale of filtered cigarettes is likely to reduce tobacco use, reduce tobacco product waste, and denormalize smoking;

Local Policy Success!

On October 8, 2024, the Santa Cruz County Board of Supervisors voted unanimously to ban the sale of filtered tobacco products.



“Enforcement...shall begin on January 1, 2027, or on a date that two additional jurisdictions in the County approve a similar ordinance, whichever date is later.”

Q & A

CONTACT US



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publichealthlawcenter@mitchellhamline.edu



www.publichealthlawcenter.org/caltobacco

www.santacruzhealth.org/tobacco



[@ca_policy_partnership](https://www.instagram.com/ca_policy_partnership)



[Law and Policy Partnership to End the Commercial Tobacco Epidemic](#)