Testimony of Commissioner Julie Menin
New York City Department of Consumer Affairs
Before the
New York City Council Committee on Consumer Affairs

Hearing on
Introduction 928: Regarding the Ban on Personal Care Products that Contain Microbeads

October 26, 2015

Introduction

Good morning Chairman Espinal, Council Member Garodnick, and members of the Committee on Consumer Affairs. I am Julie Menin, Commissioner of the Department of Consumer Affairs ("DCA"), and I am joined by my colleagues Amit Bagga, Deputy Commissioner of External Affairs, Mary Cooley, Director of City Legislative Affairs, Alba Pico, our First Deputy Commissioner, and Tamala Boyd, DCA's Deputy General Counsel. Thank you for inviting us to testify on Introduction 928 ("Intro 928"), which would ban the sale of personal care products that contain microbeads.

As my colleagues from the Department of Environmental Protection ("DEP") have testified, microbeads, which are small plastic beads added to cosmetic and personal care products such as facial scrubs, body washes, toothpaste, soaps, and shampoos, can be harmful to marine life, to human health, and to the environment at large. A report issued by the New York State Attorney General just last year estimated that approximately 19 tons of microbeads are washed into New York State's waterways annually,[1] and as you have heard, our wastewater treatment system is ill-equipped to mitigate the harmful impact of microbeads on our environment and food systems.

Ending the sale of products with microbeads is aligned with DCA's core mission to protect New York City's consumers, and we fully support the intent of Intro 928. As the committee is aware, DCA has also been fully supportive of legislation that protects the City's environment, evidenced by our robust enforcement of the "A/C" bill, and our advocacy for the recent expansion of the existing law requiring certain types of businesses to keep their doors closed while the air conditioning is on.

The importance of removing microbeads from products cannot be understated. As nine other states, as well as the country of Canada, have already passed legislation to end the manufacturing of products with microbeads, it is clear that the threat posed by microbeads to our environment is indeed serious. While DCA commends the goal of Intro 928, DCA – and our City's businesses – will face significant challenges with respect to the enforcement of and compliance with this bill as it is currently written, and we recommend revisions to the bill that would addresses key obstacles.

[1] http://ag.ny.gov/pdfs/Microbeads_Report_5_14_14.pdf

Effective Date

The bill in its current form would ban the sale of personal care products containing microbeads starting just two months from now – on January 1, 2016. Considering the amount of time retailers both large and small would need to assess which products in their existing and pre-ordered inventories contain microbeads, and the expenses they have likely already incurred to order these products, much more time is needed to allow for retailers to eliminate products with microbeads from their stock and for retailers to become educated about a new law. While DCA appreciates that placing the responsibility of not selling products with microbeads on retailers might facilitate the phasing out of such products from New York City's market, retailers are ultimately not manufacturers, who should more appropriately bear the burden of eliminating microbeads from the products they manufacture.

Indeed, many major manufacturers of such products are already responding to microbead bans now in place in many jurisdictions by beginning the process of eliminating them. California, Connecticut, Indiana, Maine, Colorado, Wisconsin, Maryland, and Illinois have all banned both the sale and manufacture of products with microbeads, with their bans on manufacturing not taking effect until early 2018 and bans on the sale not going into effect until 2019 at the earliest. Presumably, these timetables have been deemed sufficient by legislatures around the country to allow for manufacturers to phase microbeads out from products, and so banning the sale of such products in New York City as of January 2016 places an undue, extremely heavy burden on New York City's retailers, many of which are small businesses. The severity of the fine structure proposed in this legislation, which is significantly higher than DCA's standard fine structure, only further exacerbates this burden.

In order to allow for sufficient time for retailers, who have no power over the manufacturing processes of the products they sell, to comply with a ban, DCA recommends the consideration of an effective date of January 1, 2017, which is still two full years earlier than similar bans of the sale of microbead-containing products enacted by other jurisdictions.

In addition to our concerns regarding the effective date, DCA has significant concerns about the agency's ability to enforce the bill as it is currently written.

Enforcement

DCA's enforcement concerns are based primarily on two factors: the first is the ability of our inspectors to unambiguously identify which products contain microbeads and the second is their ability to actually inspect the dozens, and sometimes hundreds, of personal care products that are on the shelves of thousands of retailers across the City.

The agency's inspectors would need an accurate, comprehensive list of chemicals designated as "plastic microbeads" to ensure all products with the banned microbeads can be identified on product packaging. Such a list could be developed by a sister City agency, such as DEP or perhaps the Mayor's Office of Sustainability ("MOS"), or perhaps by a state or federal agency. This list would then have to be likely adopted by rule, not code, so it can easily be amended to keep up with changing formulations used by manufacturers. Absent such a list, our inspectors

would not be able to unambiguously identify which products contain microbeads, and, as such, would be unable to conduct enforcement.

The bill in its current form would require our inspectors to inspect as many as 14,000 retailers in New York City, as there are approximately 600 chain pharmacy locations and over 13,000 "food retail stores," a category that includes grocery stores, convenient stores, bodegas, delis, and gas stations. At many such retailers, our inspectors would have to inspect potentially hundreds of products – from cleansers to shampoos to toothpaste to soaps – to determine whether or not these products contain any of the banned chemicals considered to be microbeads. Such an inspection could potentially require hours of an inspector's time, and considering that DCA already has the responsibility of inspecting tens of thousands businesses across the five boroughs every year, enforcement of this type would simply not be possible without the infusion of significant resources.

DCA proposes that in addition to extending the effective date to 2017, that the committee consider limiting the number of products that an inspector must assess, while ensuring that a wide variety of products are assessed. For example, an appropriate and effective analog could be Suffolk County's approach to enforcement. That law requires that the county's Department of Health Services, which is responsible for enforcement, to "select no more than 10 personal care products for inspection for microbeads." Such an approach to enforcement will be significantly more efficient and we could ensure effectiveness by requiring inspectors to inspect different types of products.

Conclusion

The threat that microbeads pose to human health, marine life, and the environment is clear. There is no question that they should be eliminated from all products as quickly and efficiently as possible.

Banning the sale of products with microbeads is a potentially useful method to encourage the personal care product industry to eliminate them from products, and any such ban needs to be designed in a way that allows for efficient and effective enforcement. The ban must, of course, also not be considered pre-empted by state or federal law, an issue that the City's Law Department is currently reviewing.

I look forward to discussing with you changes to Intro 928 that will enable the City to protect its environment while ensuring that businesses can comply with the law. Thank you for the opportunity to testify today; I'll be happy to take any questions at this time.

Testimony of Eric Landau
Associate Commissioner of Public Affairs
New York City Department of Environmental Protection
before the
New York City Council Committee on Consumer Affairs
concerning
Intro. 928 – In relation to banning personal care products containing microbeads
250 Broadway – Committee Room
October 26, 2015, 10 am

Good morning, Chairman Espinal and Members of the Committee. My name is Eric Landau, Associate Commissioner of Public Affairs at the New York City Department of Environmental Protection (DEP). I am joined today by David Lipsky, Senior Policy Advisor in the Bureau of Sustainability. Thank you for the opportunity to testify on Introduction 928.

As you know, DEP's mission is to protect public health and the environment by supplying clean drinking water, collecting and treating wastewater, and reducing air, noise, and hazardous materials pollution.

Intro. 928 proposes to ban the sale of personal care products containing microbeads, which are intentionally added, non-biodegradable, solid plastic particles measuring less than five millimeters in size and used to exfoliate or cleanse in a rinse-off product. Unlike other forms of plastic pollution, the microbeads in personal care products such as facial scrubs, washes and toothpaste are designed to be washed down the drain.

DEP treats an average of 1.3 billion gallons a day of wastewater at its 14 wastewater treatment plants (WWTPs) around the city. The treatment process is complex and highly regulated. The resulting effluent is chlorinated and meets permitted effluent limits before being discharged into the local waterways. However, the vast majority of wastewater treatment systems, including ours, are not capable of capturing microbeads, allowing them to pass directly into the surrounding waters and, eventually, to the ocean.

Plastic is the predominant form of marine debris, and is estimated to comprise 60-80% of all marine debris, as well as 90% of all floating debris. Most plastic marine debris exists as small plastic particles, as even large pieces of plastic break down into small particles due to ultraviolet radiation exposure and subsequent photo-degradation. Aquatic organisms cannot distinguish these plastic pieces from small fish, plankton or krill, and ingest them.

In addition to the physical impacts of plastic pollution, microplastics may have toxicological effects. Research suggests that microplastics attract and adsorb persistent organic pollutants, such as PCBs, DDT, and PBDEs (polybrominated diphenyl ethers). Studies conducted by the University of California's Santa Barbara National Center for Ecological Analysis and Synthesis (NCEAS) show that about 78% of the chemicals recognized by the U.S. Environmental Protection Agency are associated with microplastic pollution. Additional studies at NCEAS show that toxic concentrations of pollutants and additives enter the tissue of animals that have eaten microplastic.

These pollutants accumulate in the flesh of fish, having the potential to affect marine ecosystems and, ultimately, the health of people who consume them.

As a result of their presence in personal care products and other uses, microbeads and microplastics are now ubiquitous in the marine and freshwater environments, as has been well documented in scientific literature. With respect to New York State, results of sampling of wastewater treatment plants within the state by the New York State Attorney General's office found microbeads in the effluent of 25 of the 34 wastewater treatment plants sampled. The presence of microbeads in lakes Erie and Ontario has been documented by 5 Gyres Institute and SUNY Fredonia researchers.

We believe that microbeads are an easily replaced source of plastic pollution that presents unnecessary risks better avoided by removing them from personal care products. Not only is it preferable to remove them from products beforehand than to try to remove them during the treatment process at our plants, but biodegradable alternatives to microbeads in personal care products that do not contribute to marine debris already exist, including natural, abrasive materials such as beeswax, shells, nuts, seeds, and sand, which are widely used by some product manufacturers. It is for all of these reasons that the Department of Environmental Protection supports the intent of this legislation and looks forward to working with the Council and the Department of Consumer Affairs on questions of enforcement and implementation.

Thank you again for the opportunity to testify today. David and I would be happy to address any of your questions.

Remarks on Int. No. 928, Legislation in the New York City Council Banning the Sale of Personal Care Products Containing Micobeads in New York City

Peter C. Washburn
Policy Advisor
Environmental Protection Bureau
New York State Office of the Attorney General

October 26, 2015

Good morning Chairman Espinal and members of the New York City Council's Consumer Affairs Committee. My name is Peter Washburn, policy advisor for the Environment Protection Bureau of the New York State Office of Attorney General Eric T. Schneiderman.

I appreciate the opportunity to speak with you today on behalf of Attorney General Schneiderman and in support of City Council Int. No. 928, legislation to ban the sale in New York City of personal care products containing microbeads.

* * *

New York City is recognized nationally, indeed internationally, as a leader on the environment. The City's "PlaNYC" and "OneNYC" are often held up as models for urban growth, sustainability, resiliency, and equity. The City Council has been central to this leadership.

For example, when the Council joined with the Mayor's office to enact a ban on Number 6 and Number 4 heating oil in new boilers installed in buildings in the city – and set a deadline for a ban on the use these fuels in existing buildings – the Council took a strong stand against air pollution and for protecting the health of New Yorkers. These bans have already been effective – reducing harmful soot emissions from buildings in our city by over 65 percent. As a result, the NYC Clean Heat program has become a model for cities around the world.

Notwithstanding the tremendous progress made in the City and across New York, our environment and public health continue to face important challenges – challenges that demand a continued commitment to leadership.

Today, the health of New York's waters – and the health of the fish, wildlife, and people who depend upon them – is threated by a little-known form of pollution: plastic microbeads.

While consumers are largely unaware, these tiny plastic particles, which are smaller in size than a grain of sand, are ubiquitous in face scrubs, body cleansers, toothpaste and other personal care products. When products containing microbeads are used in the home, the plastic particles are washed down the drain.

A report issued by Attorney General Schneiderman in 2014 estimated that almost 19 tons of microbeads wash down drains across the state of New York annually – with over 8 tons of this plastic pollution estimated to be washed down drains in New York City each year alone.

We know that many of the plastic microbeads that go down our drains end up in our waters.

Last year, Attorney General Schneiderman conducted a first- of- its kind study that directly documented that treatment plants across the state are not effectively removing microbeads from their wastewaters. In this study, which sampled the discharges of 34 plants from Long Island to Niagara County – including the Newtown Creek plant in Greenpoint – microbeads were found to slip past treatment at almost three-quarters of the plants.

This result is not surprising because our treatment plants are simply not designed to remove tiny plastic particles from wastewater before it is discharged to our waters.

Once microbeads enter our waters, we know they can persist for decades or longer. We also know that, in waters, plastic microbeads act like sponges for PCBs, DDT, and other highly toxic chemicals, accumulating them on their surface. The National Oceanic and Atmospheric Administration – NOAA – states that plastic can accumulate PCBs up to a million times more than the levels found in surrounding water.

When mistaken for food by small aquatic organisms, microbeads can transfer the toxic loads they carry, which serves as a pathway for dangerous chemicals to enter the food chain and concentrate as they are passed to ever larger fish and wildlife – including those that end up on our families' dinner plates.

We can stop this unnecessary pollution of our waters, and its threat to our environment and our health. We don't need plastic in our personal care products – there are a host of readily-available, equally-effective, and completely safe alternatives. Already, public pressure has caused industry leaders – such as Colgate-Palmolive and Johnson & Johnson – to replace microbeads with natural alternatives. Additional companies have committed to end their use of microbeads, although some without a firm deadline. Still others, however, others have remained silent.

We cannot afford to wait for every company to act voluntarily. With almost 19 tons of plastic microbead polluition washing down drains in New York each year, we must act now. That is why Attorney General Schneiderman supports legislation banning the sale of personal care products containing microbeads. And that is why the Attorney General supports Int. No. 928.

Like the Attorney General Schneiderman's "Microbead Free Waters Act" – which he has offered in the State Legislature – the proposed New York City Council legislation contains appropriate scope, applicability, and enforcement to achieve an effective and timely ban on microbeads in consumer care products. Critically, it also avoids loopholes that have undercut other legislation and would allow for certain types of microbeads to continue polluting our waters.

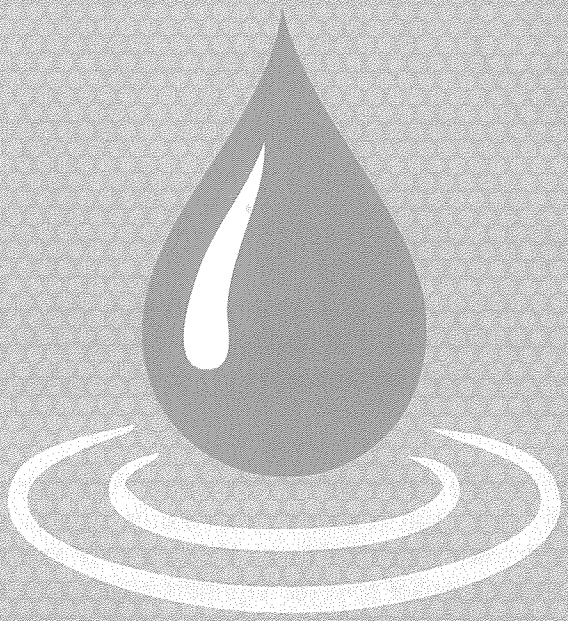
Leadership is critical to ending the widespread contamination of our waters by these unnecessary plastic pollutants.

The legislation being heard today represents such leadership, and Attorney General Schneiderman applauds bill sponsor Councilmember Garodnick, this Committee and the 20 members of the City Council who have co-sponsored Int. No. 928, for joining his effort – and that of an increasingly broad coalition of elected officials, advocates, and citizens from across the state – to ban plastic microbeads in personal care products sold in New York.

We are confident that, together, we can "ban the bead." Thank you for the opportunity to speak before you this morning.

Discharging Microbeads to Our Waters:

An Examination of Wastewater Treatment Plants in New York



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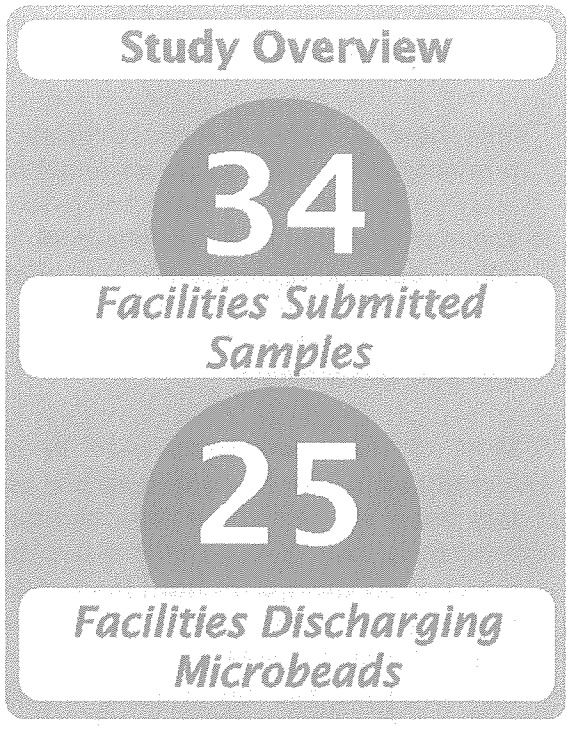
April 2015

Acknowledgements

The Office of Attorney General Eric T. Schneiderman performed this study through its Environmental Protection Bureau. The study was led by Environmental Scientist Jennifer Nalbone. The Office of the Attorney General extends its appreciation to all participants who made this study possible.

The Environmental Protection Bureau of the New York State Attorney General's Office works to protect New York's environment and public health by vigorously enforcing both the State's and Nation's environmental laws. If you are aware of any activities or conditions which may violate environmental laws or significantly harm the environment, please call the New York State Office of the Attorney General's Environmental Protection Bureau at (518) 776-2400.

Executive Summary



In late 2014, the Office of the Attorney General ("OAG") initiated a study to determine whether plastic microbeads, small plastic abrasives commonly found in personal care products, are being discharged from sewage and wastewater treatment facilities ("treatment plants") into waters across the state.

With assistance from the State University of New York at Fredonia, the New York Water Environment Association, and operators at 34 municipal and private treatment plants located across the state, the OAG study confirms that microbeads are passing through treatment plants and entering New York waters.

The OAG detected microbeads in the effluent samples from 25 of the 34 treatment plants participating in this study, suggesting that microbeads are being discharged at the majority of treatment plants operating across New York State. As such, the study provides evidence that microbeads are released into numerous waterbodies across the state including the Great Lakes, the Finger Lakes, Lake Champlain, Hudson River, Mohawk River, Delaware River, Long Island Sound and the Atlantic Ocean.

An estimated six percent of plastic microbeads used in personal care products are easily-identifiable spherical or speckled microbeads, while the overwhelming majority are irregular microbeads. As this study used only spherical and speckled microbeads to verify microbeads in effluents, the results suggest that irregular microbeads are also passing through treatment plants. For this reason, the true contribution of microplastic pollution from personal care products to surface waters is likely under-represented by the abundance of spherical microbeads alone.

Treatment plants are not designed to remove microbeads from the wastewater stream, and treatments potentially effective at removing microbeads are unproven. Even if effective treatment technologies are found to be available, the potential cost and time necessary to retrofit wastewater treatment plants with such technology is likely to be substantial. Prevention of use in personal care products is a more efficient approach to address the emerging problem of microbead pollution in New York's waters.

What are Microbeads?

Microbeads are microplastic particles, usually less than one millimeter ("mm") in diameter, produced for use as abrasives in personal care products such as toothpaste and face and body scrubs. While the term "microbead" may conjure an image of a tiny, colorful, perfectly spherical plastic bead, the personal care product industry uses the term to describe any plastic particle, regardless of size, shape or color, added to personal care products for use as an abrasive. Microbeads vary in size, with a median ranging from 0.2 to 0.4 mm in scrubs,[1] while those found in toothpaste are about 100 times smaller, around 2 to 5 micrometers in size.[2]

Most of the microbeads used in personal care products are fragments, not easily identifiable spheres or speckled pieces. In fact, spherical or speckled microbeads averaged less than six percent of the microbeads found in 16 different personal care products examined, according to data from the State University of New York at Fredonia ("SUNY Fredonia").[3] Using data from these 16 products as an industry proxy, this means, of the 19 tons of microbeads washed down New York drains annually, about 1.1 tons (6%) are the easily identified spherical or speckled microbeads. The remaining microbeads in personal care products are the irregular microbeads (see Figure 1) resembling "angular quartz grains"[4] that are difficult to distinguish from microplastic pieces originating from the breakdown of larger plastic products. To date, the attribution of microplastic pollution to personal care products is based upon finding "multi-colored spheres" less than 1 mm in diameter in environmental samples.[5] The abundance, distribution, and fate of irregular microbeads in the environment has not yet been examined.

Figure 1: Types of Microbeads

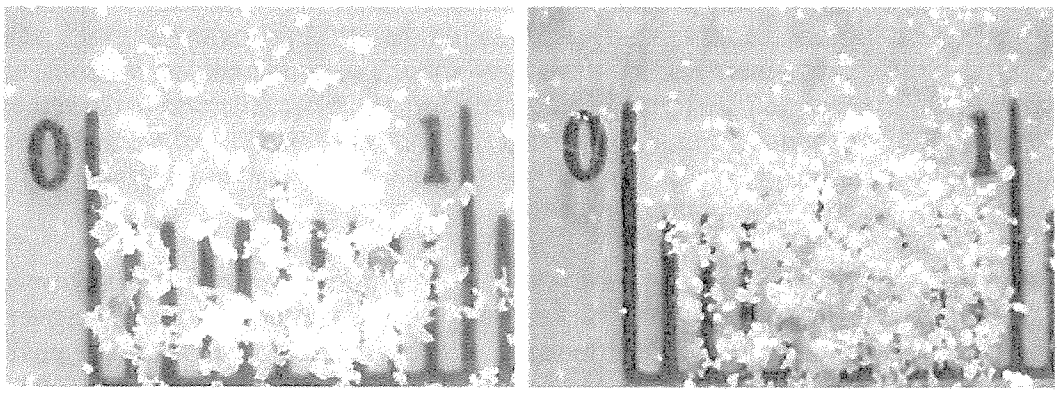


Photo Credit: OAG *Scale: 10 millimeters*

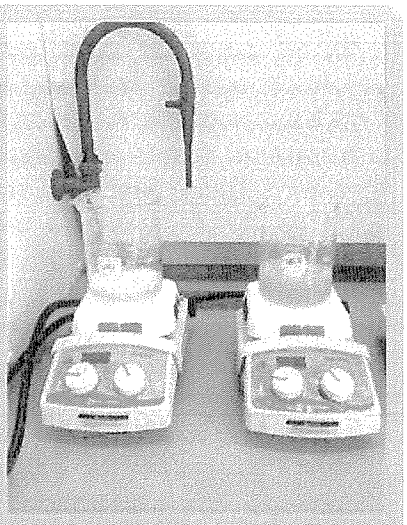
These photographs highlight two different facial scrubs with the three distinct types of microbeads commonly found in personal care products:
- ***Irregular*** **– the irregular, opaque microbeads shown in both photos.**
- ***Spherical*** **– the larger, blue and round microbeads, as shown in the photo on the left.**
- ***Speckled*** **– the larger, pink and uniformly speckled microbeads, as shown in the photo on the right.**

When personal care products containing microbeads are used by the consumer, microbeads are washed down bathroom drains into the sewage collection system on route to treatment plants. From there, the widely held assumption is that many pass through the treatment plants and discharge with the post-processing effluent into a receiving surface water.[6] These facilities are designed to capture and treat sewage, not microbeads. The OAG's 2014 report on microbeads -- *Unseen Threat: How Microbeads Harm New York Waters, Wildlife, Health And Environment* -- reviewed 610 New York State wastewater treatment plants and found only one-third employ advanced treatment technologies - tertiary screens and filters - that may be effective at removing microbeads, suggesting some microbeads were passing through most of the facilities across the state.[7,8]

When microbeads enter bodies of water, they can persist for decades, accumulating toxic chemical pollutants on their surface, and transporting pollutants as they float with currents. When mistaken for food by small aquatic organisms, microbeads may serve as a pathway for pollutants to enter the food chain and contaminate the fish and wildlife, including fish and wildlife we eat.[9] High counts of spherical microbeads were initially found in the New York open waters of Lake Erie[10] and Lake Ontario[11] in 2012 and 2013. They have subsequently been found in the open waters of Cayuga Lake, Oneida Lake, Erie Canal, and Mohawk River[12] and St. Lawrence River sediments.[13]

Wastewater Treatment Plant Effluent Sampling and Analysis Methods

In September 2014, the New York Water Environment Association[14] notified member treatment plant operators of the OAG study and asked them to participate. Operators from treatment plants supplied post-processing effluent samples for this study between October 2014 and January 2015. The range of volumes of wastewater treated and the types of advanced treatment unitized by treatment plants that participated in the study are similar to the range of facilities found across New York State as outlined in the 2014 OAG report. Ten of the facilities (29 percent of participants) use an advanced filter that may be effective at removing microbeads. The volume of wastewater treated at the facilities ranged, on average, from 30 thousand to 92 million gallons per day.



Photograph 1
Treatment plant effluent samples undergoing wet peroxide oxidation.
Photo credit: OAG

Dr. Sherri Mason, Professor of Chemistry at SUNY Fredonia, developed a sampling protocol based on a National Oceanic and Atmospheric Administration ("NOAA") sampling protocol entitled "Laboratory Methods for the Analysis of Microplastics in Wastewater Treatment Plant Effluent." In addition to the sampling protocol, participating treatment plant operators were also provided an eight-inch diameter, 0.355 mm Tyler sieve and three sample bottles. Participating operators collected between one and three post-processing effluent samples from a sampling port, or from an effluent pipe, well or flume using pump and tube equipment. Post-processing effluent is treated wastewater obtained after all processing has occurred, but just prior to being released into the receiving water body. Participating operators collected the samples through a sieve at a recommended flow rate of approximately 10 to 20 liters per minute, with the sieves left in place between 2 to 24 hours. For each sample, all contents collected on the sieve were transferred into one clean sample container.

Photograph 2
A small portion of treatment plant post-treatment effluent is sieved at the facility and sent to SUNY Fredonia for analysis.
Photo credit: OAG

The treatment plants mailed their samples to SUNY Fredonia for analysis. Under the oversight of Dr. Mason, the samples were processed and analyzed using an established laboratory methodology based on microplastic surveys conducted in the oceans and the Great Lakes.[15,16,17,18]

Photograph 3
SUNY Fredonia student technician looks for microbeads in a processed sample under a dissecting microscope.
Photo credit: Dr. Sherri Mason, SUNY Fredonia

Excess water and organic material in the sample was removed using wet peroxide oxidization. Microplastic pieces remaining in the sample were then removed physically with the help of a dissecting microscope. To confirm the passage of microbeads through treatment plants, this study only used spherical and speckled microbeads detected in effluent samples, rather than trying to also include irregularly shaped microbeads to avoid possible confusion with irregularly shaped fragments from other sources. Identification of spherical and speckled microbeads was performed by comparing size, texture and shape of microbeads removed from the effluent samples to microbeads obtained directly from various personal care products. Spherical and speckled microbeads collected from effluent samples were also verified as being of the same chemical composition (polyethylene) as those obtained directly from personal care products using a Bruker Alpha FT-IR spectrometer.

Study Results

The New York Wastewater Treatment Plant Microbead Study detected microbeads in samples of post-processing effluent from wastewater treatment plants located across New York State. Spherical and speckled microbeads, as shown in Figure 2 below, were detected in 25 of 34 (74%) of the sampled treatment plants. A map and full list of the studied treatment plants are found in Figure 3 and Table 3.

While collection and analysis of irregular microbeads was not a goal of this study, microplastics closely resembling irregular microbeads were detected in effluent samples.

Figure 2: Microbeads from Treatment Plants

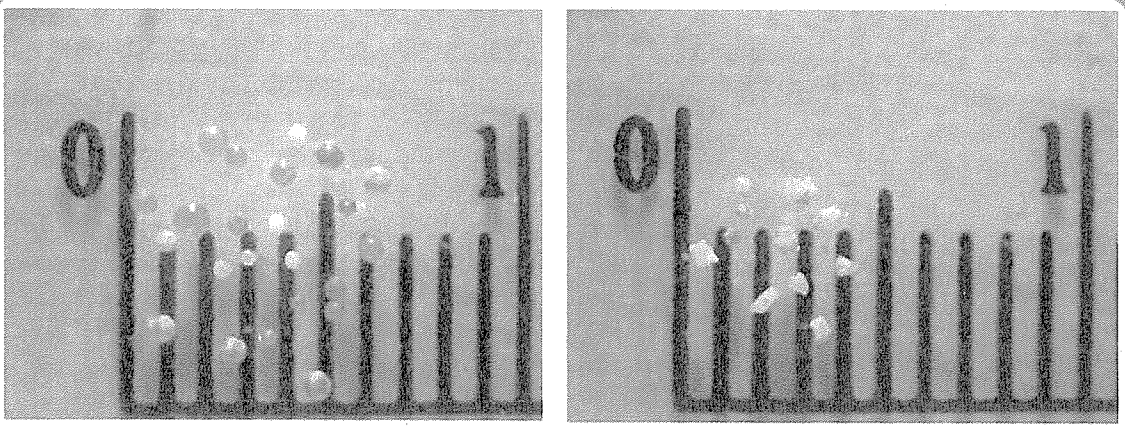


Photo Credit: OAG

Spherical (left) and speckled (right) microbeads were collected from the effluent samples of participating treatment plants and verified as the same size, shape and chemical composition as spherical and speckled microbeads removed from personal care products.

The study did not verify microbeads in the effluent at nine of the 34 facilities sampled. Of these nine facilities, six employ a form of advanced filtration that may increase efficacy of microbead removal from the wastewater stream. These include treatment units classified as membrane microfiltration, continuous backwash upflow dual sand (CBUDS) microfiltration, and rapid sand filters. The nine facilities were predominantly smaller in size, with the largest self-reporting an average annual flow rate of 16 million gallons per day. Of the 25 facilities where microbead release was verified, four did employ an advanced treatment unit that may increase efficacy of microbead removal, such as a rapid sand filter, continuous backwash sand filter, or unspecified type of tertiary filtration. See Table 1 below for an overview of treatment plant results and Table 2 for a list of results from facilities using advanced filters.

Table 1:
Treatment Plant Results by Size, Microbead Detection and Advanced Treatment Use.

Treatment Plant Design Size (Gallons/day)	Number of Treatment Plants in NYS[8]	Plants Participating in OAG Study	Plants with Microbeads Detected in Effluent	Advanced Filter in Use	Microbeads Detected in Effluent with Advanced Filter in Use
0 - 100,000	178	4	1	2	0
101,000 - 1,000,000	251	9	5	4	1
1,001,000 - 10,000,000	132	13	11	2	1
10,001,000 - 100,000,000	39	7	7	2	2
100,001,000 - 999,000,000	10	1	1	0	0
TOTAL	610	34	25	10	4

Table 2:
Filter treatment units as reported by participants of this study, as listed by categories defined by the NYS DEC report, *Descriptive Date of Municipal Wastewater Treatment Plants.*

Treatment Unit	Plants Sampled in OAG Study and Microbeads Detected	Plants Sampled in OAG Study and Microbeads not Detected
Filtration, unspecified	2	-
Microfiltration (CBUDS)	-	3
Microfiltration (Membrane)	-	2
Rapid Sand (High Rate) Filters	1	1
Continuous Backwash Sand Filter	1	-

Figure 3: Sampled Locations where Microbeads were Detected

Microbeads were detected in the effluent samples provided by treatment plants denoted by the green dots. Out of 34 participating facilities, a total of 25 had microbeads present in the samples submitted. The gray dots on the map are locations of over 600 untested treatment plants across the state.

The detection of microbeads in effluent samples from 25 treatment plants confirms that microbeads are being released into numerous waterbodies across the state, including into the Great Lakes, Finger Lakes, Lake Champlain, Hudson River, Mohawk River, Delaware River, Long Island Sound and the Atlantic Ocean. Refer to Table 3 for a complete list of results by facility, county and receiving waterbody.

Conclusion

The OAG study detected microbeads in small samples of post-processing effluent from wastewater treatment plants located across New York State. Microbeads were detected in samples submitted by 25 of the 34 participating treatment plants (74 percent), and suggests that microbeads from personal care products are passing through the majority of the additional 600+ untested wastewater treatment plants operating across New York State.

Microbead release was confirmed only if spherical or speckled microbeads were detected in treatment plant effluent. These easily identifiable microbeads make up only six percent of the microplastic particles used in personal care products. The discovery of spherical and speckled microbeads in effluent samples strongly suggests irregular microbeads from personal care products are also passing through treatment plants, and these products' total contribution of microplastic pollution to the environment is likely under represented by the abundance of spherical microbeads collected in open-water surveys.

The absence of spherical or speckled microbeads in the one-time samples from nine treatment plants is not conclusive evidence that all microbeads are captured at those facilities during wastewater processing. Factors such as possible temporal fluctuation in microbead concentrations in effluent, the potential for some specific primary or secondary treatments to capture microbeads, or samples taken at the bottom of effluent pools where microbeads may be floating at the surface, could contribute to the reasons why microbeads were not found. Our results also indicate the absence of microbeads in discharges from some facilities may be explained by the use of an advanced filter more commonly used by facilities treating relatively small volumes of water. This finding, however, is based on limited sampling and a small dataset and should be considered preliminary.

Treatment plants are not designed to remove microbeads from the wastewater stream, and treatments potentially effective at removing microbeads are unproven. Even if effective treatment technologies are found to be available, the potential cost and time necessary to retrofit wastewater treatment plants with such technology is likely to be substantial. Prevention of use in personal care products is a more efficient approach to address the emerging problem of microbead pollution in New York's waters.

Table 3: Results of Sampling from Wastewater Treatment Plants

Microbeads were detected in the samples submitted by facilities with a √ below.

Microbeads	Treatment Plant Facility	County	Receiving Waterbody
√	Albany County Sewer District	Albany	Hudson River
√	Mohawk View Water Pollution Control Plant	Albany	Mohawk River
	Village of Endicott Water Pollution Control Plant	Broome	Susquehanna River
√	Village of Silver Creek Treatment Plant	Chautauqua	Lake Erie
√	City of Hudson Wastewater Treatment Plant	Columbia	Hudson River
√	Village of Delhi Wastewater Treatment Plant	Delaware	West Branch of the Delaware River
	Town of Andes Sewer District	Delaware	Tremper Kill
	Village of Walton Sewage Treatment Plant	Delaware	West Branch of the Delaware River
√	Erie County Sewer District No. 3 - Southtowns Advanced Wastewater Treatment Plant	Erie	Lake Erie
√	Town of Grand Island Wastewater Treatment Plant	Erie	Niagara River
√	Erie County Sewer District No. 6 - Lackawanna Wastewater Treatment Plant	Erie	Smokes Creek, tributary to Lake Erie
√	Erie County Sewer District No. 2 - Big Sister Creek Wastewater Treatment Plant	Erie	Big Sister Creek, tributary to Lake Erie
√	Village of Lake Placid Sewage Treatment Plant	Essex	Chubb River, tributary to the Ausable River
√	Town of Westport Wastewater Treatment Plant	Essex	Lake Champlain
	Village of Chateaugay Wastewater Treatment Plant	Franklin	Chateaugay River
	Village of Hunter Wastewater Treatment Plant	Greene	Schoharie Creek
	Town of Windham Wastewater Treatment Plant	Greene	Batavia Kill
√	Village of Athens Wastewater Treatment Plant	Greene	Hudson River
√	Newtown Creek Water Pollution Control Plant	Kings	East River
√	Frank E. VanLare Wastewater Treatment Plant	Monroe	Lake Ontario
√	Northwest Quadrant Wastewater Treatment Plant	Monroe	Lake Ontario
√	Cedar Creek Water Pollution Control Plant	Nassau	Atlantic Ocean
√	Niagara County Sewer District No. 1	Niagara	East Branch of the Niagara River
√	City of Middletown Wastewater Treatment Plant	Orange	Wallkill River
√	Port Jervis Sewage Treatment Plant	Orange	Neversink River
	Villa Roma Resort & Conference Center	Sullivan	Jones Brook
√	Village of Potsdam Water Pollution Control Plant	St. Lawrence	Raquette River
√	Ithaca Area Wastewater Treatment Facility	Tompkins	Cayuga Lake
	Lake Mohonk Mountain House	Ulster	Tributary to Coxing Kill
	Pine Hill Wastewater Treatment Plant	Ulster	Birch Creek
√	City of Glens Falls Wastewater Treatment Plant	Warren	Hudson River
√	Village of Palmyra Wastewater Treatment Plant	Wayne	Erie Canal
√	Westchester County DEF- Yonkers Joint	Westchester	Hudson River
√	Westchester County DEF- Port Chester Wastewater Treatment Plant	Westchester	Long Island Sound

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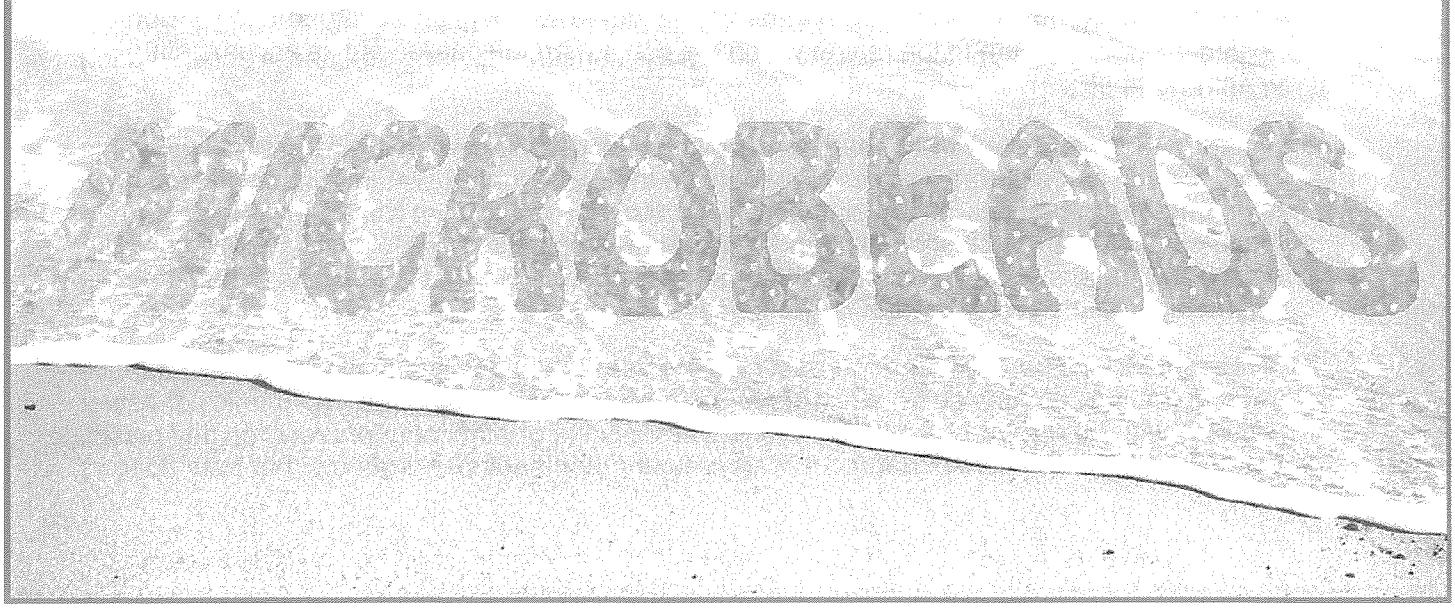
Unseen Threat:

How Microbeads Harm New York Waters, Wildlife, Health And Environment

From the Office of:

New York State Attorney General

Eric T. Schneiderman



EXECUTIVE SUMMARY

New York waters are being polluted with microbeads: tiny plastic beads produced for use as abrasives in cosmetics and personal care products. Buoyant, multicolored and often spherical, these plastic microbeads are washed down bathroom sinks, pass through wastewater treatment plants, and end up discharged into New York's waters. In our waters, microbeads persist for decades, acting as sponges for toxic chemical pollutants. Mistaken for food by aquatic organisms, microbeads serve as a pathway for pollutants to enter the food chain and contaminate the fish and wildlife we eat.

The most effective way to address this problem is at the source—the consumer products that contain microbeads. Fortunately, plastic is not an essential ingredient in cosmetics and personal care products and several major producers have already committed to replacing plastic abrasives with natural alternatives to address this new source of pollution. Attorney General Schneiderman's "Microbead-Free Waters Act" will ensure the entire industry follows suit. In fact since introduction of the Microbead-Free Waters Act, one of the largest cosmetics companies in the country has announced that it will replace plastic microbeads in its products with natural alternatives such as minerals and ground seeds.

By prohibiting the sale of cosmetic or personal care products containing microbeads in New York, Attorney General Schneiderman's Microbead-Free Waters Act will protect New York's fish and wildlife, and help safeguard New York's long-standing efforts to protect and enhance its water resources.

Part 1 –MICROBEADS IN OUR WATERS

A. Microbeads: A New Threat

In the 80 years since the start of its commercial production,[1] plastic has become an integral part of our daily life. With its tremendous range of uses, from the construction of homes, to health-care, food preservation, transportation, and communication, annual global plastic production has continuously grown from 1.9 million tons in the 1950s to 317 million tons in 2012.[2] Many of the desirable properties of plastic—low cost, durability, and corrosion resistance—also contribute to the rate at which it is consumed, discarded and is accumulating in our environment.

Plastic has become a ubiquitous symbol of pollution across the globe in the form of recognizable objects, such as detergent bottles washed up on the shore, or supermarket bags and six-pack rings entangling wildlife. Today, our waters are facing a new threat from a lesser-known and much smaller form of plastic pollution known as microplastic. Microplastic is plastic smaller than 5 millimeters, whether intentionally manufactured to be that size or as a result of the fragmentation and breakdown of larger plastic products.[3]

The cosmetic and personal care product industry uses intentionally manufactured microplastic in products that are designed, when used as intended, to be disposed into municipal sewer systems without regard to our ability to recover, recycle, or otherwise prevent the tiny plastic beads from entering the environment. This industry manufactures products that New Yorkers

use every day containing microplastic used as abrasives, and marketed as "microbeads." Microbeads are virtually indestructible, often perfectly spherical, multicolored, buoyant, and typically much smaller than 5 millimeters—making them quite distinct from other plastic found in the environment. Unsuspecting consumers discharge these tiny pieces of unrecoverable plastic into New York waters via the bathroom drain when they wash off products–such as facial scrubs, soaps, and toothpastes–that contain microbeads.[4]

B. The Problem of Plastic Microbeads in New York's Great Lakes

Manta trawl deployed during the first-ever Great Lakes survey to examine plastic pollution in the Great Lakes.

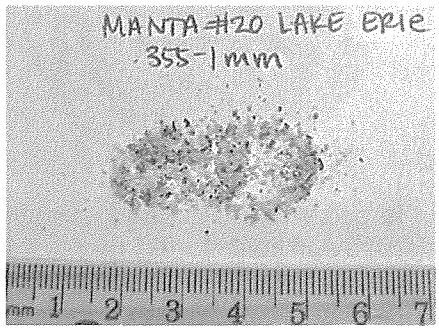
(Photo credit: Dr. S.Mason, SUNY Fredonia)

Until recently, research on the magnitude of plastic pollution in the Great Lakes had been sparse, consisting of limited surveys of beaches and shorelines for large plastic litter. Beginning in 2012, a research team that included scientists from the State University of New York at Fredonia and The 5 Gyres Institute[5], began sampling Lakes Superior, Huron, and Erie to more thoroughly understand the scope of plastic pollution in the Great Lakes.

The 2012 Great Lakes survey revealed that the Great Lakes have some of the highest concentrations of microplastic found in the environment, and microbeads were prevalent.

To examine the Great Lakes for plastic pollution, the researchers modeled their investigations on previous surveys conducted in the Atlantic and Pacific Oceans which examined massive "garbage patches"[6] of small plastic pieces collecting in ocean gyres[7] far off the coastline. The Great Lakes researchers collected 21 samples using a mesh collector called a "manta trawl," capable of collecting debris floating on the surface of the water greater than 0.355 millimeter (mm) in size. The manta trawl was dragged behind the research vessel and time and travel speed were monitored so that estimates of plastic concentrations could be made. As the abundance of microplastic is related to the opening size of the mesh collector,[8] open water surveys likely underestimate the concentration of the smallest pieces of microplastic present.

Back in the laboratory, non-plastic materials, such as ash, vegetation and algae, were removed from the samples and remaining pieces were verified as plastic. The plastic was sifted, classified, and quantified by size and type and the resulting concentrations were calculated for each sample taken. After noting high counts of what the researchers called microplastic "pellets" in the Great Lakes samples, two national brands of facial cleansers containing polyethylene microbeads were sifted and examined. The spherical microbeads within these products were compared to the spherical pellets from the open water samples, and the latter were identified as microbeads due to similar shape, size, color and elemental composition.[9]



Microbeads collected from New York waters of Lake Erie in 2012.

(Photo credit: Dr. S. Mason, SUNY Fredonia)

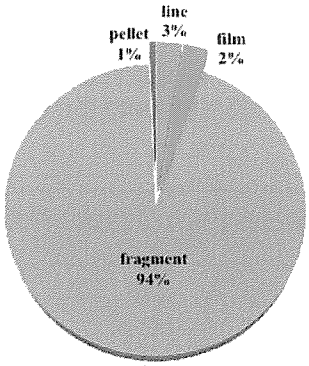
The concentrations of microplastic from the Great Lakes rivaled the highest concentrations of microplastic collected from the world's ocean garbage patches. A comparison of average and high concentrations from surveys performed across the North Pacific, South Pacific, and North Atlantic subtropical gyres, is presented in the table below. New York's Lake Erie waters accounted for the vast majority of plastic collected in the 2012 Great Lakes survey.

In both the Great Lakes and Pacific gyres, virtually all of the plastic collected was microplastic under 4.75 mm in size. However, as seen the table below, the size of microplastic differed, with most of the Great Lakes microplastic being particularly small—less than 1 mm in size—compared to the Pacific gyres.

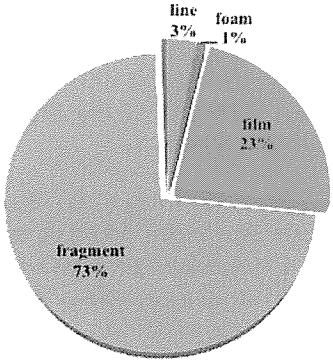
Sampling area	Highest concentration (pieces per sq. km)	Average concentration (pieces per sq. km)	Percent microplastic <4.75mm	Percent microplastic <1mm
South Pacific Gyre[10]	396,342	26,898	91%	35%
Great Lakes[11]	466,305	43,157	98%	81%
North Atlantic Gyre[12]	580,000	20,328	n/a	n/a
North Pacific Gyre[13]	969,777	334,271	93%	53%

Microbeads dominated the Great Lakes samples. Fifty-eight percent of all microplastic less than 1 mm collected in the Great Lakes was spherical, compared to less than one percent in both the North Pacific and South Pacific subtropical gyres. Most microplastic less than 1mm in the North and South Pacific subtropical gyres was a fragment (73 percent and 94 percent respectively), as shown in the diagrams below.

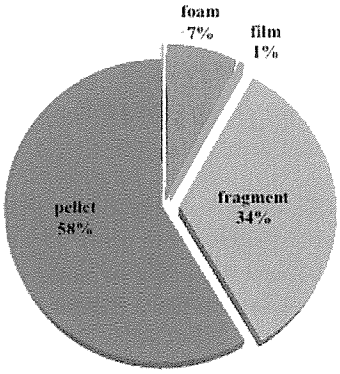
South Pacific <1 mm



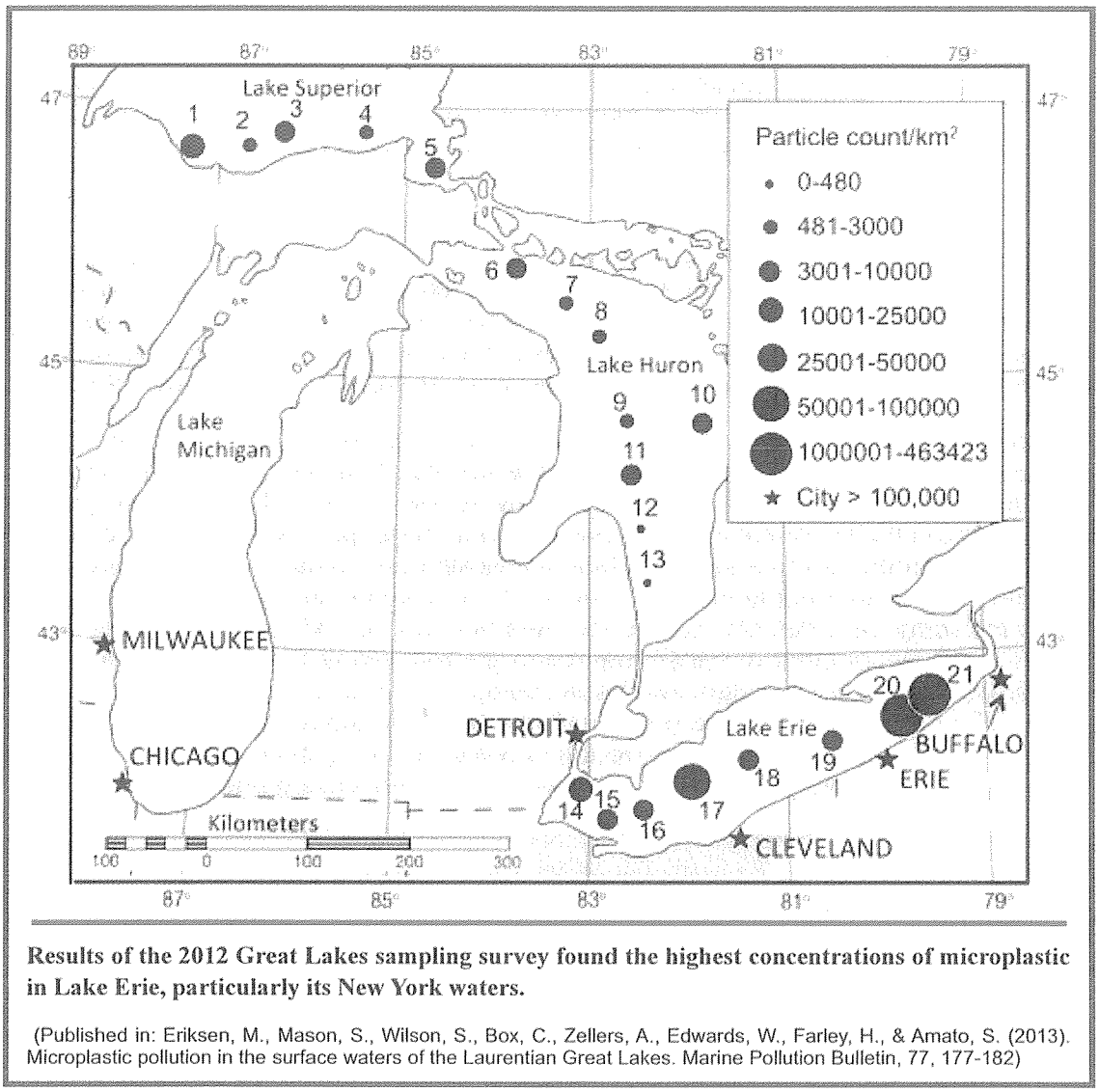
North Pacific <1 mm



Great Lakes <1 mm



To confirm and expand upon their 2012 findings, SUNY Fredonia researchers led surveys in 2013 and collected 91 manta trawl samples from Lakes Michigan, Erie and Ontario. Preliminary results confirm high concentrations of microbeads collected from New York's waters; in the 2013 samples, the abundance of microplastic fragments increased in relation to microbeads, but microbeads continue to be detected in significant amounts. SUNY Fredonia researchers are now examining whether concentrations of microbeads in relation to microplastic fragments are higher in samples taken closer to shore compared to further offshore.[14]



Results of the 2012 Great Lakes sampling survey found the highest concentrations of microplastic in Lake Erie, particularly its New York waters.

(Published in: Eriksen, M., Mason, S., Wilson, S., Box, C., Zellers, A., Edwards, W., Farley, H., & Amato, S. (2013). Microplastic pollution in the surface waters of the Laurentian Great Lakes. Marine Pollution Bulletin, 77, 177-182)

C. The Risks Posed by Microbeads in New York's Waters

Scientists project that plastic can persist in the environment for centuries.[15] Numerous studies have documented the occurrence of plastic debris in the environment and its physical and toxicological effects on aquatic organisms from ingestion. Meanwhile, microplastic concentrations in aquatic environments are increasing rapidly.[16] This accumulation of microplastic is of particular concern because microplastic has the potential to be ingested by a much wider range of organisms than large debris, making it and the chemicals it carries bioavailable throughout the food chain. Additionally, once discharged, there are no known methods to effectively remove microplastics or microbeads from the environment.

Physical Impacts from Wildlife Ingestion

Wildlife of all types and sizes mistake plastic as food and consume it. Hundreds of different species have been documented as ingesting plastics, ranging from tiny creatures,[17,18] to small fish,[19,20] to larger species like birds, turtles and mammals.[21] In the Great Lakes, SUNY Fredonia researchers performing food web surveys are finding plastic in the gastrointestinal tracts of perch.[22]

Ingested plastic causes internal abrasions or blockages resulting in reductions in food consumption, stunted growth, and starvation.[23,24,25,26] Additionally, studies have found microplastics pass from a species digestive tract to its circulatory system,[27] and are physically transferred from prey to predator.[28,29] In mussels, ingestion of plastic pieces so small they are invisible to the naked eye, reduce filter feeding, which could lead to starvation.[30]

Potential for Toxicity

Wildlife ingestion of plastic also presents the potential for toxicity to both the ingesting species and other species higher in the food chain. Harmful chemicals transferred to wildlife from ingested plastic include chemicals added to plastic during manufacturing, and "hydrophobic pollutants" that collect on the surface of the plastic once in either salt or fresh water, such as polychlorinated biphenyls (PCBs), DDT, and polycyclic aromatic hydrocarbons (PAHs).[31, 32,33]

Hydrophobic pollutants are chemicals that when in water preferentially adhere to other substances like plastic or sediment. When these pollutants attach to buoyant microplastic they have greater ability to disperse in lakes, rivers and oceans. Hydrophobic pollutants accumulate in the bodies of animals, are passed on to larger predators, and concentrate up the food chain through a process called biomagnification, eventually contaminating the fish and wildlife species that humans like to eat. These pollutants can lead to a host of health problems including birth defects, cancer, and learning and growth deficits in children. The New York State Department of Health has been tracking many of these pollutants in fish, turtles and waterfowl in New York waters including the Great Lakes, Finger Lakes, Lake Champlain, St. Lawrence River and Hudson River. Concentrations of hydrophobic pollutants in many species remain above protective target levels resulting in consumption advisories, especially for children, pregnant women, and women of childbearing age.

Plastic debris accumulates pollutants such as PCBs (polychlorinated biphenyls) up to 100,000 to 1,000,000 times the levels found in seawater.

- National Oceanic Atmosphere Association, 2011.

Many plastic products contain chemical additives that leach out, especially when exposed to weathering, heat or ultraviolet light.[34] For example, Bisphenol-A, is a chemical additive and a known endocrine disrupting chemical that is banned in certain children products in New York. Endocrine disrupting chemicals produce adverse developmental, reproductive, neurological, and immune effects in both humans and wildlife. They have been linked to a number of common ailments, including heart disease, immune system disruption, brain deterioration, type-2 diabetes, cancer and obesity. They pose the greatest risk during prenatal and early childhood development when organ and neural systems are forming.[35]

Once ingested, microplastics facilitate the transfer of chemicals to some species low on the food chain,[36] where they can be passed on to larger predators. Chemicals from plastic ingestion have also harmed fish[37] and lower trophic organisms.[38,39] Great Lakes scientists are at the forefront of research confirming this toxicological harm in the Great Lakes. Researchers at the University of Wisconsin have verified that microplastic in the Great Lakes is contaminated with films of hydrophobic pollutants, for example, recently measured concentrations of PAH's are approximately twice the levels found on microplastic in the Atlantic Ocean.[40]

The newest environmental threat to the Great Lakes is very, very small... Scientists have worried about plastic debris in the oceans for decades, but focused on enormous accumulations of floating junk. More recently, the question of smaller bits has gained attention, because plastics degrade so slowly and become coated with poisons in the water like the cancer-causing chemicals known as PCBs.

- The New York Times, December 14, 2013

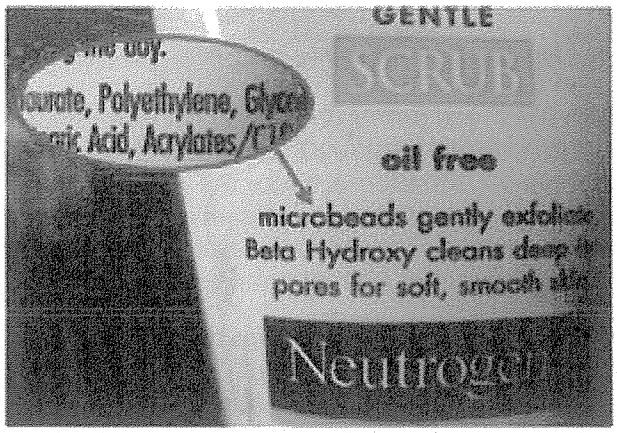
D. Microbeads: Traveling From The Medicine Cabinet to New York's Waters

Plastic Microbead Abrasives in Cosmetics and Personal Care Products

Patented for use in cleansers in 1972, for decades microbead abrasives were rarely used in consumer products and were considered only a minor source of plastic pollution.[41] Starting in the 1990s, manufacturers began replacing more natural materials such as ground almonds, oatmeal and sea salt in personal care products with plastic microbeads,[42] increasing the likelihood of their discharge to New York's surface waters. An ongoing investigation has identified over 100 cosmetics and personal care products containing microbeads in the United States, including those considered over-the-counter drugs.[43]

The Bioré and Clearasil products shown were filtered in a laboratory to determine the presence of microbeads. The products contained plastic microbeads in different quantities and of different sizes, shapes and colors, as shown by the vial of microbeads to the left of each product.

(Photo credit: State of New York, Office of the Attorney General)



Various personal care products and over the counter drugs listing "polyethylene" or "polypropylene" as an ingredient contain plastic microbeads of different sizes, shapes, colors, and quantities. Johnson & Johnson, the maker of the Neutrogena product pictured, has voluntarily committed to phasing out plastic microbeads as an ingredient in its products.

(Photo credit: 5 Gyres)

Microbead shape, size and composition vary. Studies of products containing microbeads found sizes ranging from 0.004 mm to 1.24 mm.[44,45,46] Microbeads are most commonly composed of polyethylene or polypropylene,[47] and are often perfectly spherical in shape, but are also found in irregular shapes.[48]

Overall, the annual per-capita consumption of microbeads from cosmetics and personal care products in the United States is estimated at approximately 0.0309 ounces per person per year.[49] With over 19.65 million people living in New York State[50], this adds up to nearly 19 tons of microbeads potentially being discharged into New York's wastewater stream each year.

As of 2011, the leading companies in the personal-care product and cosmetic market include Procter & Gamble, Unilever, Colgate Palmolive, L'Oréal, and Revlon, as shown in the table below. Once alerted that microbeads contribute to environmental pollution, the top three industry leaders made public pledges to remove plastic microbeads from their product lines.[51] L'Oréal followed up with a pledge to remove microbeads from their products after introduction of Attorney General Schneiderman's Microbead-Free Waters Act.[52] Some companies, such as Burt's Bees,[53] chose never to use plastic microbeads in their products.

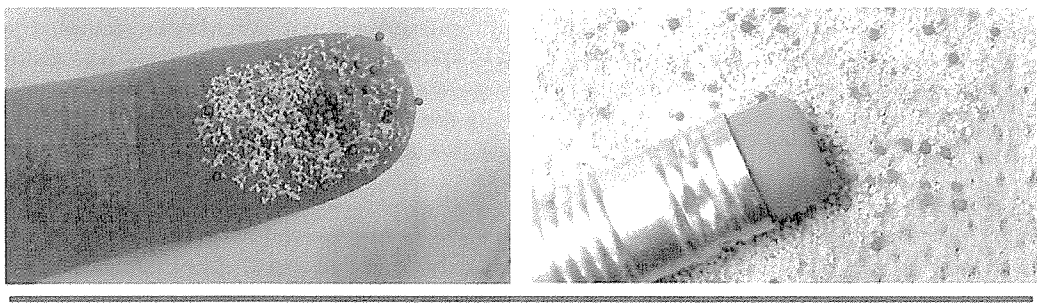
Five Largest Personal-Care Product and Cosmetic Companies as of 2011[54]

Company	Market Share
Procter & Gamble	16%
Unilever	5%
Colgate Palmolive	4%
L'Oréal USA Inc.	3.4%
Revlon, Inc.	2.5%

Most Wastewater Treatment Plants Unable to Prevent Discharges of Microbeads

Cosmetics and personal care products containing microbeads are designed to be disposed of with no possibility of recovery or recycling. Once a product containing microbeads is washed off a person's hands or face, the cleaning agents plus the microbeads are rinsed down the drain and enter wastewater systems. Most wastewater is processed through a wastewater treatment plant, and the ability of a wastewater treatment plant to capture microbeads depends upon its specific treatment capabilities.

Because of their small size and buoyancy, many microbeads escape capture by wastewater treatment plants, which typically filter water through a coarse (greater than 6 mm), or a fine (1.5–6 mm) screen.[55] Subsequently, microbeads in the treated water are discharged to rivers, lakes, or oceans, where they accumulate and persist. Microbeads were found in the effluent of six of seven New York wastewater treatment plants recently sampled by SUNY Fredonia researchers.[56]



Microbeads range in size, but are typically one millimeter or smaller.

(Photo credit Alliance for the Great Lakes)

Additionally, microbeads in wastewater can also make their way into our waters during combined sewer overflow events. Combined sewer systems collect and transport storm water runoff, domestic sewage, and industrial wastewater in the same pipe, and are a major water pollution concern. During periods of heavy rainfall or snowmelt, the volume of wastewater in a combined sewer system can exceed the capacity of the wastewater treatment plant. When this happens, combined sewer systems discharge excess wastewater containing untreated sewage, industrial waste, pollution and debris directly into nearby water bodies. There are approximately 937 combined sewer overflow outfalls in New York State.

Taxpayers Would Shoulder Costs to Upgrade Wastewater Treatment Plants

Effective wastewater treatment plants are instrumental in keeping our waters clean. However, most of our current wastewater treatment facilities are unable, without potentially costly retrofits, to remove plastic microbeads. For example, the National Association of Clean Water Agencies, the trade group for publicly owned wastewater treatment authorities, has recently classified microbeads as an "emerging contaminant,"[57] defined as a material entering the wastewater stream that treatment facilities are not designed to remove or break down.

As of 2004, New York State Department of Environmental Conservation (DEC) data indicate that there are 610 wastewater treatment plants of various sizes across the state, of which 70% serve small populations and handle less than 1 million gallons of wastewater per day (mgd), while the ten largest plants handle flows greater than 100 mgd.[58]

In order for a wastewater treatment plant to effectively remove microbeads, some form of advanced treatment would be required. Based on the DEC data, about one-third, or 207, of the state's wastewater treatment plants—and only one of the state's ten largest plants—currently use some form of advanced screening or filtration.

For example, DEC data shows that Nassau County predominately relies on thirteen wastewater treatment plants of different sizes and capabilities. The two largest of Nassau's wastewater treatment plants service over 1 million of the total 1.349 million county residents. However neither plant employs advanced treatment that may effectively remove microbeads. This means when the residents of Nassau County unknowingly wash approximately 1.3 tons of microbeads down the drain every year, most are entering plants not equipped to stop them from being discharged into the Atlantic Ocean, Reynolds Channel and other surrounding waters.

In Erie County, population 919,000, residents unknowingly discharge almost one ton of microbeads into the wastewater stream each year. Most Erie County residents' wastewater travels to a local plant for treatment. The largest wastewater treatment plant in the county has the capacity to service 600,000 residents in and around Buffalo. It also does not employ advanced screening or filtration, and its effluent discharges into the Niagara River.

Statewide, the DEC data reveals that within the universe of 610 wastewater treatment plants in New York:

- 23 plants use a fine screen or micro-screen, that may be capable of removing microbeads.
- 175 plants use microfiltration, sand or mixed media filtration, or other type of advanced filtration that may be capable of removing microbeads.
- 9 plants use a combination of an advanced screen technology, and some form of advanced filtration, which together should provide the most effective microbead removal.
- 403 plants use no advanced treatment method likely to effectively remove microbeads from the wastewater stream.

Plant-by-plant studies would be required to 1) determine the efficacy of microbead removal at the 207 plants noted above that use advanced treatment methods, 2) calculate the cost of upgrades needed for any of the 207 plants found to insufficiently capture microbeads, and 3) calculate the cost of upgrades needed to capture microbeads at the 403 remaining wastewater treatment plants.

Reasonable cost estimates for necessary upgrades cannot be made without a technical analysis of feasibility and alternatives performed for each specific facility. The cost to upgrade can vary extensively depending on site-specific factors such as, but not limited to, the existing facility size, existing design and treatment capabilities, potential adaptability to modifications, and specific technology selected for installation.[59]

NYS Wastewater Treatment Plants as of 2004 with Advanced Screens and Filters

Plant Design Size (Gallons/day)	Number	Screen	Filters	Screen + Filter	Percent Using Screen and/or Filter
0-100,000	178	2	82	2	48%
101,000-1,000,000	251	10	63	6	31%
1,001,000-10,000,000	132	9	23	1	25%
10,001,000-100,000,000	39	1	7	0	21%
100,001,000-999,000,000	10	1	0	0	10%

PART 2 – THE MICROBEAD-FREE WATERS ACT – A SOLUTION FOR NEW YORK

"Plastic debris is unsightly; it damages fisheries and tourism, kills and injures a wide range of marine life, has the capacity to transport potentially harmful chemicals... and can represent a threat to human health."

- Scientific and Technical Advisory Panel of the Global Environment Facility, 2011.

"America's plastics makers agree that litter doesn't belong in our oceans, waterways or any part of our natural environment."

- Steve Russell, American Chemistry Council, Vice President of Plastics, February 15, 2013.

"For society to receive the benefits that plastics can provide, it is essential to properly recover them so that litter does not threaten our natural environment, including marine ecosystems. ... [We] are firmly committed to the principle that plastics do not belong in the world's oceans..."

- Declaration of the Global Plastics Associations for Solutions on Marine Litter, 2011.

"Unilever has decided to phase out plastic scrub beads from personal care products. This is because we believe we can provide consumers with products that deliver a similar exfoliating perfomance without the need to use plastics. We expect to complete this phase globally by 2015..."

- Unilever, 2013.

A. Scientists and Industry Agree: Plastic Has No Place in Our Waters

Scientists, governments, plastic manufacturers, the personal-care product industry and the public all agree on the fundamental principle that plastic should not litter our lands and waters.[60,61,62,63]

At least 21 companies around the world that produce or carry cosmetics and personal care products have made some level of commitment to phase out microbeads in their products, or not carry products containing them.[64] Global alliances are working to curb the use of microbeads in cosmetics and personal care products, and have been instrumental in securing voluntary commitments from companies to phase out microbeads, as well as in launching smartphone apps allowing consumers to scan products to check for the presence of microbeads.[65]

Policymakers are engaging, both on the international and domestic fronts. Internationally, the Dutch parliament is promoting a European ban on microplastic in cosmetics.[66] Closer to home, the Great Lakes - St. Lawrence Cities Initiative, a binational coalition of over 100 mayors, is calling on companies to phase out the use of microbeads by 2015.[67]

However, with many current industry commitments lacking a phase-out deadline and with many more companies still unresponsive, additional effort is needed to hold the industry to a consistent, protective standard.

B. The Proposal – Ban Microbeads in Cosmetics and Personal-Care Products

Plastic pollution is extensive and long lasting, and New York is committed to preventing the irresponsible release of microbeads into State waters before it occurs.

New York has been a national leader in addressing concerns related to plastic pollution and associated toxic exposure, including enactment of:

- The 2008 Plastic Bag Reduction, Reuse and Recycling Law, which requires retail stores 10,000 square feet or larger to offer a plastic bag recycling option.

- The 2010 Bisphenol A-Free Children and Babies Act, which ended the sale of Bisphenol-A-containing child-care products, such as baby bottles and pacifiers, used by children under three years old.

- The 2013 Returnable Container Act, which expanded the beverage container deposit and collections system to include bottled water, thus increasing plastic recycling quantities.

We can build on this legacy by passing legislation to address the emerging form of plastic pollution threatening State waters—microbeads.

For taxpayers, the Microbead-Free Waters Act represents the most cost-effective approach for eliminating the release of microbeads from cosmetics and personal care products into the environment. The bill is first-in-the-nation bipartisan legislation that would prohibit the sale in New York of any beauty product, cosmetic, or other personal-care product containing plastic less than five millimeters in size.

When they wash their face or brush their teeth, New Yorkers should not have to worry that they may be dumping plastic into the same water they drink, and in which they swim and fish. The Microbead-Free Waters Act will ensure that manufacturers of cosmetics and personal care products quickly phase out the use of plastic microbead abrasives and instead use natural alternatives in their products.

> **"From the Great Lakes to the Hudson River to Long Island Sound, our commitment to protecting and restoring New York's waters is among our most important responsibilities. New York's environmental leadership contines with the introduction of common-sense legislation that will stop the flow of plastic from ill-designed beauty products into our vital waters, preserving our natural heritage for future generations."**
>
> - New York Attorney General Eric T. Schneiderman, February 11, 2014.

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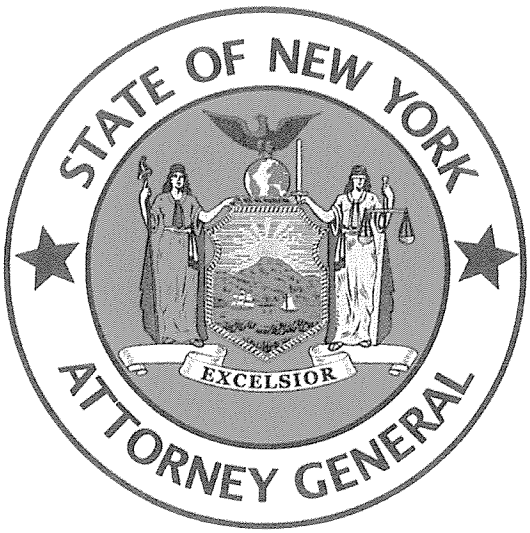
The Office of the Attorney General Attorney General Eric T. Schneiderman produced this report through the Office's Environmental Protection Bureau led by Bureau Chief Lemuel M. Srolovic. The report was prepared by Environmental Scientist Jennifer Nalbone.

The Environmental Protection Bureau of the New York State Attorney General's Office works to enforce a zero tolerance policy against any environmental threats in New York that imperil the air we breathe, the water we drink, and the land we live on. If you are aware of any activities or conditions which may violate state or federal environmental laws or significantly harm the environment, please call the New York State Office of the Attorney General's Environmental Protection Bureau at (518) 474-8096.


STATE OF NEW YORK
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ATTORNEY GENERAL

NYPIRG
NEW YORK PUBLIC INTEREST RESEARCH GROUP

FOR THE RECORD

TESTIMONY
OF THE
NEW YORK PUBLIC INTEREST RESEARCH GROUP
BEFORE THE
NEW YORK CITY COUNCIL
REGARDING
INTRO 928, "NEW YORK CITY WATERWAY PROTECTION ACT OF 2015"
New York, N.Y.
October 26, 2015

Good afternoon, my name is Farouk Abdallah and I am the Deputy Director of the New York Public Interest Research Group (NYPIRG). NYPIRG is a non-partisan, not-for-profit, research and advocacy organization. Consumer protection, environmental preservation, health care, higher education, and governmental reforms are our principal areas of concern. We appreciate the opportunity to testify in support of Intro 928, which would ban the sale of microbeads in New York City.

As you know, microbeads are tiny plastic particles added to personal care products as a scrubbing agent or exfoliate.[1] Over the past decade, manufacturers have been using plastic microbeads as an alternative to pumice, sea salt, and other natural abrasives. They are now emerging as a serious environmental threat to waterways.

These tiny plastic particles snake down the drains of consumers and past the protections of wastewater treatment facilities until they make their way into New York's waterways, and eventually to the ocean. This is a particular problem in the Great Lakes which have seen alarmingly high levels of microbeads collecting in their waters due to lengthy water turnover rates. In 2012, researchers found that microbeads made up half of all plastics collected on the surface of Lake Erie.[2] Microbeads are found in other waterways as well, including the Hudson River.[3]

Microbeads, like other plastics, collect toxins and chemicals within the water. They are mistaken for food by birds and marine life, thus allowing the pollution to climb up the food chain through

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[1] For a detailed look at the impact of microbeads in New York: New York State Office of the Attorney General's report, "Unseen Threat: How Microbeads Harm New York Waters, Wildlife, Health And Environment," see: http://ag.ny.gov/pdfs/Microbeads_Report_5_14_14.pdf.
[2] Drury, T., "NYS Legislation would ban cosmetic microbeads," *Buffalo Business First,* 2/11/14, see: http://www.bizjournals.com/buffalo/news/2014/02/11/nys-proposes-law-to-ban-cosmetic-beads.html?page=all.
[3] New York State Office of the Attorney General, "Down The Drain: Microbeads in the Mid-Hudson," see: http://www.ag.ny.gov/pdfs/Mid-Hudson_NY_Combined.pdf.

9 Murray Street, Lower Level ♦ New York, NY 10007-2272 ♦ 212-349-6460 ♦ Fax 212-349-1366
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bio-magnification. It is likely that many fish harvested for human consumption have been contaminated by ingesting microbeads.

The growing concern over microbeads has spurred action across the nation. California, Colorado, Connecticut, Illinois, Indiana, Iowa, Maine, Maryland, New Jersey, and Wisconsin have passed laws banning microbeads.[4] Cattaraugus, Chautauqua, Erie and Suffolk counties have passed microbead bans.

Intro 928 will help protect New York City waterways and our natural ecosystems by preventing plastic pollution and may spur similar action in Albany and in Washington, DC.

NYPIRG urges your support for this important initiative.

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[4] National Conference of State Legislatures, "States Continue to Ban Microbeads," see: http://www.ncsl.org/blog/2015/10/14/states-continue-moves-to-ban-microbeads.aspx.

CHPA CONSUMER HEALTHCARE PRODUCTS ASSOCIATION
founded 1881

Testimony of the
CONSUMER HEALTHCARE PRODUCTS ASSOCIATION
concerning
INT. 928
presented to the
CONSUMER AFFAIRS COMMITTEE
NEW YORK CITY COUNCIL
OCTOBER 26, 2015

Submitted by: Sean Moore, Associate Director, State Government Affairs

Good morning, Chairman Espinal and distinguished members of the Consumer Affairs Committee, my name is Sean Moore and I appreciate the opportunity to appear before you today to testify on behalf of the Consumer Healthcare Products Association (CHPA) **in opposition to Int. 928 as drafted**. While intended to prohibit the use of plastic microbeads in personal care products and over-the-counter (OTC) medicines, the bill could actually affect far more products than actually contain microbeads.

CHPA is the 134-year-old trade association representing the leading manufacturers and marketers of OTC medicines and dietary supplements. Every dollar spent by consumers on OTC medicines saves the U.S. healthcare system $6-$7, contributing a total of $102 billion in savings each year. CHPA is committed to promoting the increasingly vital role of over-the-counter medicines and dietary supplements in America's healthcare system through science, education, and advocacy.

CHPA member companies understand that plastic pollution in the environment is a serious concern to regulators, policy makers, advocacy groups and the public. Despite a lack of scientific consensus on the environmental impact of plastic microbeads used in consumer products, CHPA's member companies do not oppose the phase-out of plastic microbeads from OTC medications. In fact, many manufacturers began proactively phasing-out the use of plastic microbeads prior to the introduction of any legislation on this matter.

While CHPA does not oppose the gradual phase-out of microbeads, we believe strongly that laws to prohibit microbeads must also be aimed at avoiding a patchwork of differing laws across jurisdictions. Such laws should specify the appropriate products in scope and reasonable timelines for manufacturers to develop suitable replacement products and phase-out existing products. To date, nine states and three New York counties (Erie, Chautauqua and Cattaraugus) have adopted laws banning microbeads in personal care products and over-the-counter medicines.

While CHPA would prefer this issue be addressed at the state level, we understand Councilman Garodnick's desire for New York City to lead on this issue and have committed to working with him and the City Council to address our concerns with the language before you this morning. CHPA's foremost concerns are centered on ensuring that the scope of this proposal aligns with laws in other jurisdictions – so that Int. 928 does not inadvertently affect far more products than intended – and that adequate time is provided to reformulate products and ensure compliance with the law.

CHPA proposes amending Int. 928 so that it clearly defines "microbeads".

Because our members' products are marketed nationally, it is exceedingly important to maintain uniformity across jurisdictions, particularly regarding the way key terms are defined. CHPA is concerned that the definitions for key terms in Int. 928 are inconsistent with what has been adopted by the nine states and three New York counties that have taken similar actions. Furthermore, as drafted, Int. 928 could prohibit the sale of hundreds of products that do not even contain plastic microbeads.

The definition of "microbead" included in the bill is so vague that it could prohibit the use of ingredients that are not plastic microbeads and do not contribute to the environmental concerns the bill seeks to address. This overly broad application of the term "microbead" has the unintended consequence of expanding the scope of products impacted by the law, and would not yield any significant environmental benefit, but would cost companies hundreds of thousands of dollars to comply. Products like lip balm and sunscreen could be banned for sale in New York City, even though these products don't contain microbeads.

In the end, such a proposal will have a negative impact on consumers, as they would no longer have access to these important products, which would be pulled from store shelves, returned to manufacturers and destroyed as part of manufacturer and retailer efforts to comply with the law.

To prevent such unintended consequences, CHPA proposes to revise the definition of "microbead" so that it applies only to those products that actually include microbeads. The scope of Int. 928 can be clarified so that it accomplishes its intended goals by utilizing the definitions below:

> "over-the-counter drug" means a drug that is a personal care product that contains a label that identifies the product as a drug as required by 21 CFR 201.66. An "over-the-counter drug" label includes a drug facts panel or a statement of the active ingredients with a list of those ingredients contained in the compound, substance, or preparation.
>
> "personal care product" means any article intended to be rubbed, poured, sprinkled, or sprayed on, introduced into, or otherwise applied to the human body or any part thereof for cleansing, beautifying, promoting attractiveness, or altering the appearance, and any article intended for use as a component of any such article, including but not limited to hand and body soaps, exfoliants, shampoos, toothpastes, and scrubs. "Personal care product" does not include a product for which a prescription is required for distribution or dispensation.
>
> "plastic" means a synthetic material made from linking monomers through a chemical reaction to create an organic polymer chain that can be molded or extruded at high heat into various solid forms retaining their defined shapes during life cycle and immediately after disposal.
>
> "plastic microbead" means any intentionally added non-biodegradable solid plastic particle measured less than five millimeters in size and used to exfoliate or cleanse in a rinse-off product.

CHPA proposes amending the legislation so that it provides a manageable timeframe for implementation.

Consumers demand products that perform effectively and consistently. The January 1, 2017 timeframe proposed in the bill does not provide OTC manufacturers adequate time to phase –out existing products from the market, which are safe and effective when used according to labeling directions, and to identify and phase-in viable alternatives to plastic microbeads. CHPA's member companies have ceased developing new products containing plastic microbeads and are working to formulate comparable replacement products. When altering the formulation of an OTC medication, manufacturers require more lead time than is provided in Int. 928.

Changing OTC formulations requires manufacturers to first complete the necessary product research and development and complete relevant trials and stability testing in accordance with good manufacturing practices and regulations. After approving a new formulation, the ingredient supply chain must be realigned to assure sufficient supply for production. New labels and marketing materials must be designed; many label claims are based on comparative studies, which will need to be redone. Machinery may need to be recalibrated or replaced, and at the same time, existing inventories must be cleared at both the wholesale and retail level to avoid unintentional violations.

Revising the effective dates to be the same as the timeframes adopted by nine states would provide manufacturers the time necessary to replace plastic microbeads in all of the product lines in which they are currently used. As such, CHPA recommends including the following timelines in Int. 928:

a. Beginning December 31, 2017, no person shall manufacture for sale a personal care product, except for an over-the-counter drug, that contains synthetic plastic microbeads.

b. Beginning December 31, 2018, no person shall accept for sale a personal care product, except for an over-the-counter drug, that contains synthetic plastic microbeads.

c. Beginning December 31, 2018, no person shall manufacture for sale an over-the-counter drug that contains synthetic plastic microbeads.

d. Beginning December 31, 2019, no person shall accept for sale an over-the-counter drug that contains synthetic plastic microbeads.

CHPA is concerned that as drafted, Int. 928 represents a serious deviation from how concerns regarding microbeads are being addressed in other states. The bill could prohibit the sale of important products that do not contain microbeads, and the implementation timeframes do not provide manufacturers enough time to replace microbeads in the products where they are found. It is not possible for national brands to operate within a patchwork of differing state and local laws. The definition of "microbead" should be revised so that it applies only to actual microbeads, which are used to exfoliate and cleanse, and the implementation timeframe should be amended to provide manufacturers adequate time to comply.

CHPA sincerely appreciates your consideration of our position on this important issue. I am happy to answer any questions you might have.

ENVIRONMENTAL
ADVOCATES OF **NEW YORK**
YOUR GOVERNMENT WATCHDOG

Testimony

Saima Anjam
Environmental Advocates of New York

before

The New York City Council
Committee on Consumer Affairs

Re: Intro 928

Monday, October 26, 2015

Environmental Advocates of New York's mission is to protect our air, land, water and wildlife and the health of all New Yorkers. Based in Albany, we monitor state government, evaluate proposed laws, and champion policies and practices that will ensure the responsible stewardship of our shared environment. We work, through coalitions and with our advocacy network of more than 45,000 people, to support and strengthen the efforts of New York's environmental community and to make our state a national leader.

Environmental Advocates supports Intro 928 and applauds the leadership of Council Member Garodnick for introducing this measure which would ban microbeads from personal care products. We also support resolution 3665, which calls upon the New York State legislature and the Governor to take action on A.5896/S.3932, also known as the "Microbead-Free Waters Act." The bill referenced in the resolution passed the New York State Assembly with overwhelming bipartisan support (139-1) but was not taken up by the Senate, despite cosponsorship by 59% of

all senators. This is a common-sense measure that will reduce the impact of plastic pollution in the waters of New York State. Washing your face should not contribute to water pollution.

The state Senate's inaction has forced local governments, such as New York City, to take the lead. We applaud you for your efforts. Since July, two counties have enacted bans (Erie and Chautauqua), and two more have passed bans which are awaiting the signatures of the county executives (Suffolk and Cattaraugus). Several more have measures in the legislative process.

Microbeads are tiny plastic particles that create a huge problem. Microbeads threaten public health, wildlife and ecosystems on a nationwide scale. Most New Yorkers are unaware their personal care products like face wash or toothpaste may contain tens of thousands of tiny plastic beads per bottle – microbeads – which wash down the drain, wreak havoc on wastewater systems, escape treatment plants, and end up polluting local waterbodies. These little plastic pellets are hidden in plain sight - they're the size of a grain of sand.

Microbeads are actually designed to flow down your drain. Our wastewater treatment plants are not equipped to handle them, so they get past filters and continue into our waterbodies. Microbeads act like sponges, absorbing toxics like PCB's, pesticides and motor oil as they make their way from our drains to our waterbodies. They are similar in appearance to fish eggs, making it easier to be ingested, traveling up the food chain from marine organisms to birds and fish, finally reaching humans.

There is no known method of preventing microbeads from entering and then removing them from our waterways. The United States washes almost 308 tons of microbeads down the drain each year – more than the weight of the Statue of Liberty. New York State alone washes 19 tons of microbeads down the drain annually. Studies involving the Great Lakes showed elevated levels of microbeads. A study by Dr. Sherri Mason, Chemistry Professor at SUNY Fredonia, found that 80 percent of the plastic pollution in the Great Lakes came from microbeads. Plastics do not degrade like natural materials -- they persist in the environment for decades. Even if a filtration system was developed, there is no way to remove the plastic pollution from the phytoplankton and zooplankton that are needed for the success of waterbodies.

Another team of scientists, known as the Plastic Tides, collected samples from waterbodies on an attempted trip last year between Cayuga Lake in Ithaca and the State Capitol. While they did not complete the trip due to weather conditions, 70 percent of samples collected along the water, from multiple waterbodies, contained microbeads; some samples were collected as far as 100 yards from shore.

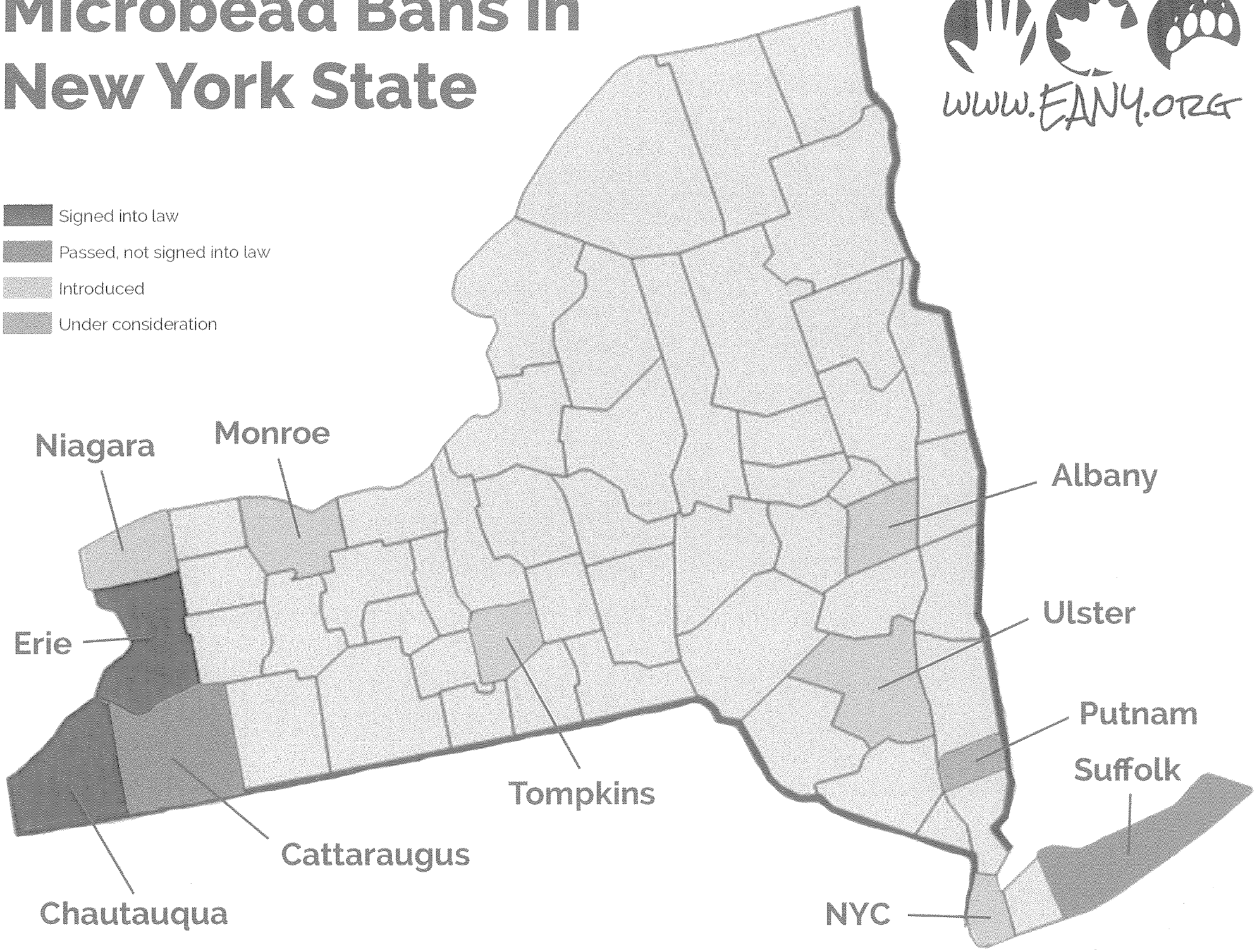
Alternatives exist –ground up walnut shells, oatmeal and sea salt – which will exfoliate just as well or even better than these harmful microplastics. There is no justifiable reason for companies to continue manufacturing products that contain these harmful beads. Microbeads are not essential in personal care products.

It is unfortunate the New York State Legislature has not addressed this problem. Luckily, 10 counties - from western New York to Long Island - are stepping up to take care of this manufactured problem. Microbeads are bad for the environment and they certainly don't do anything to make you more beautiful. We support the New York City Council for proposing this local law which will benefit consumers and our environment.

Thank you for the opportunity to submit testimony on this important legislation which reduces plastic pollution in New York City. Pollution from these unnecessary plastic beads is an important issue that needs to be addressed immediately. We urge immediate to passage and enactment.

Microbead Bans in New York State

www.EANY.org



Contact:
October 20, 2015
Contact:
Ya-Ting Liu
(212) 361-6350 x203
yliu@nylcv.org

Memorandum of Support
Intro 0928-2015

A Local Law to amend the administrative code of the city of New York, in relation to banning personal care products containing microbeads.

The New York League of Conservation Voters (NYLCV) strongly supports Intro 0928-2015 sponsored by Council Member Daniel R. Garodnick.

Many personal care products like soaps, facial scrubs, and toothpaste contain tens of thousands of tiny plastic bits designed to increase the abrasiveness of the product. Over the past decade, these plastics have replaced nut husks and sea salts as abrasives. After consumers use a product containing microbeads in their shower or sink, the microbeads are washed down the drain and into waste water treatment systems. Unfortunately, these microbeads are so small that they pass right through most municipal waste water treatment plants and into our waterways, lakes, and oceans.

Once spread throughout the marine environment, they enter the food chain. Fish are unable to distinguish between food and microbeads; some microbeads even look similar to fish eggs, which would be a natural food source. Fish consuming microbeads are at risk of starvation, reduced food consumption due to satiation, or intestinal blockage leading to death.[1] The Long Island and Great Lakes fishing grounds, already fragile and under environmental stress, should be protected from microbeads that could further degrade their health.

In addition, filter species like those from Long Island's waters—clams, mussels, oysters, and scallops—ingest but not expel microbeads. Microbeads accumulate in the gut of filter-feeding shellfish and are transferred to the circulatory system where they persist for weeks.[2] Birds, other animals, and humans eating shellfish are likely ingesting plastic bits when they eat shellfish.

Microbeads themselves attract harmful pollutants such as PCBs, motor oil, and pesticides already present in the water. Several scientific studies have determined that species that ingest microbeads build up unhealthy concentrations of these toxins and pollutants.[3] Eventually, these dangerous substances could end up in seafood meant for people to eat.[4]

The legislation rightly defines microbeads as any plastic particle smaller than five millimeters. Microbeads smaller than 50 microns may actually pose a larger risk of harming aquatic life and to human food contamination, since sea creatures at the base of the food chain ingest them.

Adding these unnecessary plastics to products that will ultimately end up in our waterways, lakes, and oceans is strangely insensitive to the environmental impacts. For these reasons, NYLCV strongly urges passage of Intro 0928-2015 in the 2015 legislative session.

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[1] Darraik, J.C.B., "The Pollution of the Marine Environment by Plastic: A Review," *Marine Pollution Bulletin* Sept. 1, 2002, pp. 842-852
[2] Brown, M.A., *et. al.*, "Ingested Microscoping Plastic Translocates to the Circulatory System of the Mussel," *Environmental Science Techonology*, 42 (2008), pp. 5026-5031
[3] Rios, L.M., *et. al.*, "Persistent Organic Pollutants Carried by Synthetic Polymers in the Ocean Environment," *Marine Pollution Bulletin 54*, 2007; E.L Tueten, *et.al.*, "Potential for Plastics to Transport Hydrophobic Contaminants," *Environmental Science Technology 41*, pp.7759-7764
[4] Derraik, *supra.*

FOR THE RECORD

NY/NJ Baykeeper
Sandra Meola
Communications and Outreach Associate
sandra@nynjbaykeeper.org
732-999-9870 ext 7

Testimony in support of Int. No. 928- A Local Law to amend the administrative code of the city of New York, in relation to banning personal care products containing microbeads.

NYC Committee on Consumer Affairs
Monday October 26, 2015

My name is Sandra Meola and I represent NY/NJ Baykeeper. Baykeeper is the citizen guardian of the Hudson-Raritan Estuary. Through our programs, we seek to end pollution, restore aquatic habitats, and educate the public.

I am in here today in support of NYC bill 928 which would ban the sale of personal products containing plastic microbeads with the city by January 2016. This is an aggressive bill that will prevent plastic pollution in NYC waterways quickly and effectively. Additionally, this bill does not include a loophole similar to bills in Illinois and New Jersey, that would allow so called bio-degradable plastics to still appear on shelves.

Baykeeper is in the process of analyzing water samples from throughout the NY/NJ Harbor waters and have already found hundreds of microplastic particles including beads within our samples.

It's clear that these little beads cause big problems. Last year, the NY Attorney General's office released a report that estimates 19 million tons of microbeads are being discharged in New York waterways annually. Microbeads are typically composed of plastics known as polyethylene (PE) or polypropylene (PP), which are listed in the ingredients of common toothpastes and scrubs. The problem is, plastic microbeads do not dissipate during use. Instead, microbeads that are left behind after brushing can be embedded under the gumline.

In terms of environmental concerns, microbeads are too tiny to be filtered by wastewater treatment facilities so they are discharged into waterways where they never bio-degrade, adding to the plastic smog within our oceans. Plastic absorbs toxins already present in the water such as PCBs and DDT that are mistaken for food by fish and birds. Once ingested, the pollutants can be transferred from the microbeads into an organism's tissue with adverse effects and can interfere with our food source.

Several manufacturers, including Johnson and Johnson, L'Oréal, Colgate-Palmolive, Proctor and Gamble, and Unilever have already pledged to eliminate microbeads from their products over the next several years. But until then, this bill would get these products off the shelves.

We commend NYC Council members for their leadership and are confident that this bill will influence lawmakers to quickly pass a New York state bill to prevent further harm to public health and the marine environment. Thank you.

SURFRIDER
FOUNDATION
NEW YORK CITY CHAPTER

Testimony of John Coghlan
Rise Above Plastics Representative
Surfrider Foundation, NYC Chapter

We all know what microbeads are, where they are found and how they are washed down the drain, are rarely captured by wastewater treatment facilities (because they're too small, do not biodegrade, and float), pass through wastewater treatment facilities, and eventually enter our waterways and pollute our oceans. These microplastics are found in all ocean gyres, bays, gulfs and seas around the world. This is problematic for a multitude of reasons.

First, plastic does not biodegrade into elements or compounds commonly found in nature like other organic materials, but instead, photodegrades into smaller pieces of plastic causing pollution that is virtually impossible to remediate. I repeat, for emphasis, plastic does not biodegrade into elements or compounds commonly found in nature like other organic materials, but instead, photodegrades into smaller pieces of plastic causing pollution that is virtually impossible to remediate.

Another major problem is how microplastic debris absorbs toxic, environmentally persistent chemicals such as DDT, PCBs, PAHs, and flame retardants found in our waterways. In 2011, the National Oceanic Atmospheric Association found that plastic debris accumulates pollutants such as PCBs up to 100,000 to 1,000,000 times the levels found in seawater. That is to say that a single plastic microbead can be 1 million times more toxic than the water around it. (See National Oceanic and Atmospheric Association, "What We Know About: Plastic Marine Debris." Sept. 2011, available at: http://marinedebris.noaa.gov/sites/default/files/Gen_Plastic-hi_9-20-11_0.pdf)

As microplastics do not biodegrade but rather degrade into smaller particles that absorb toxins, they pose a tremendous threat to wildlife. Aside from the negative effects of plastic consumption by marine life such as intestinal clogging and starvation, fish can become contaminated by the plastic's absorbed toxins, which bioaccumulate up the food chain. The process is simple. Small ocean animals, like fish, ingest tiny plastic particles. These toxic particles pass on to us when we eat seafood.

Microbeads are a big problem.

Surfrider Foundation is hopeful that this Council will address the very serious threats that microplastic pollution poses to our coastal resources and water quality.

NYPIRG
NEW YORK
PUBLIC INTEREST
RESEARCH GROUP

FOR THE RECORD

TESTIMONY
OF THE
NEW YORK PUBLIC INTEREST RESEARCH GROUP
BEFORE THE
NEW YORK CITY COUNCIL
REGARDING
INTRO 928, "NEW YORK CITY WATERWAY PROTECTION ACT OF 2015"
New York, N.Y.
October 26, 2015

Good afternoon, my name is Farouk Abdallah and I am the Deputy Director of the New York Public Interest Research Group (NYPIRG). NYPIRG is a non-partisan, not-for-profit, research and advocacy organization. Consumer protection, environmental preservation, health care, higher education, and governmental reforms are our principal areas of concern. We appreciate the opportunity to testify in support of Intro 928, which would ban the sale of microbeads in New York City.

As you know, microbeads are tiny plastic particles added to personal care products as a scrubbing agent or exfoliate.[1] Over the past decade, manufacturers have been using plastic microbeads as an alternative to pumice, sea salt, and other natural abrasives. They are now emerging as a serious environmental threat to waterways.

These tiny plastic particles snake down the drains of consumers and past the protections of wastewater treatment facilities until they make their way into New York's waterways, and eventually to the ocean. This is a particular problem in the Great Lakes which have seen alarmingly high levels of microbeads collecting in their waters due to lengthy water turnover rates. In 2012, researchers found that microbeads made up half of all plastics collected on the surface of Lake Erie.[2] Microbeads are found in other waterways as well, including the Hudson River.[3]

Microbeads, like other plastics, collect toxins and chemicals within the water. They are mistaken for food by birds and marine life, thus allowing the pollution to climb up the food chain through

[1] For a detailed look at the impact of microbeads in New York: New York State Office of the Attorney General's report, "Unseen Threat: How Microbeads Harm New York Waters, Wildlife, Health And Environment," see: http://ag.ny.gov/pdfs/Microbeads_Report_5_14_14.pdf.

[2] Drury, T., "NYS Legislation would ban cosmetic microbeads," *Buffalo Business First,* 2/11/14, see: http://www.bizjournals.com/buffalo/news/2014/02/11/nys-proposes-law-to-ban-cosmetic-beads.html?page=all.

[3] New York State Office of the Attorney General, "Down The Drain: Microbeads in the Mid-Hudson," see: http://www.ag.ny.gov/pdfs/Mid-Hudson_NY_Combined.pdf.

PERSONAL CARE
PRODUCTS COUNCIL

STATEMENT
OF THE
PERSONAL CARE PRODUCTS COUNCIL

ON: HEARING ON BILL NO. 928:
BANNING PERSONAL CARE PRODCUTS CONTAINING MICROBEADS

TO: NEW YORK CITY COUNCIL
COMMITTEE ON CONSUMER AFFAIRS

DATE: OCTOBER 26, 2015

BEFORE THE NEW YORK CITY COUNCIL
COMMITTEE ON CONSUMER AFFAIRS

Statement of Michael F. Thompson
Senior Vice President, Government Affairs
Personal Care Products Council
October 26, 2015

Good morning, my name is Mike Thompson, Senior Vice President of Government Affairs for the Personal Care Products Council (Council). I am pleased to be here today to comment on Introduction 928, which would ban personal care products that contain microbeads. In general, the Council supports the effort to prohibit microbeads in cleansing and exfoliating products, but we urge New York City to implement legislation that is consistent with the model legislation that has been adopted around the country.

The Personal Care Products Council is the leading national trade association representing the cosmetic and personal care products industry. The Council's 600+ member companies distribute and supply the vast majority of products marketed in the US. As the makers of a diverse range of products that consumers rely on and trust every day, our companies are global leaders committed to safety, quality and innovation.

Many of our member companies' corporate headquarters or manufacturing facilities are located in New York. The overall personal care and beauty industry contributes $20 billion annually to the state's economy and $5 billion to the state in annual taxes. Our industry employs more than 190,000 workers - including jobs in manufacturing, distribution and sales.

Microbeads have been used in some personal care cleansing products because they have safe and effective exfoliating properties with no adverse effects on consumers such as allergic reactions, and because they are gentle on the skin, especially for consumers with acne or sensitive skin conditions.

Due to concerns raised about the macroenvironmental impact of microbeads, however, our member companies voluntarily committed to stop using microbeads in favor of other viable alternatives, ahead of any legislative proposals.

Last year, a wide range of environmental, governmental and business stakeholders, including the Council and our member companies, came together in Illinois to develop legislation that would phase out plastic microbeads. All stakeholders supported the bill, which passed both houses unanimously and was signed into law in June. In August, the Illinois law was accepted by the Council of State Governments (CSG) Committee on Suggested State Legislation (SSL). Language consistent with the Illinois model has become law in seven additional states (Connecticut, Colorado, Indiana, New Jersey, Maine, Maryland and Wisconsin) and two New York counties (Erie and Chattauqua).

We fully supported the laws in other states because we believed those laws represented a pragmatic and reasonable approach. The prohibitions in these laws begin in 2018, ensuring that manufacturers

of all sizes have adequate time to reformulate with alternative ingredients that are safe for consumers and the environment and that meet all requirements of the Federal Food, Drug and Cosmetic Act. The development of a new cosmetic product involves numerous scientific disciplines and multiple areas of expertise and can often take years to complete. Unfortunately, it is not as simple as replacing one ingredient for another. Reformulation times vary based on company and size, sourcing of new ingredients and retrofitting manufacturing facilities.

Introduction 928 has a much earlier effective date. The proposed January 1, 2016 timeframe would be extremely problematic not only for manufacturers and retailers who want to develop new products with sustainable ingredients, but also for the consumers that use products containing microbeads. These consumers may not be aware of the reason why they can no longer purchase their products in New York City and may be encouraged to visit neighboring areas to purchase these products rather than wait for a viable alternative to come to market. With adequate time to reformulate, our members can have time to fully insure that new products are efficacious, environmentally friendly, and educate the consumer to prepare them for the switch to products without microbeads, and effectively market the new alternative products.

The Council is very committed to continuing to support passage of thoughtful microbeads legislation that is beneficial to manufacturers, retailers, and especially to consumers. We encourage the City Council to adopt a microbeads law that is consistent with other jurisdictions. This industry has led the way and shown their environmental stewardship and only asks for reasonable time frames and consistent laws especially in the New York Metropolitan area since both New Jersey and Connecticut have moved ahead with laws in the past year.

We greatly appreciate your consideration of our views on this issue.

Thank you.

FOR THE RECORD

NY/NJ Baykeeper
Sandra Meola
Communications and Outreach Associate
sandra@nynjbaykeeper.org
732-999-9870 ext 7

Testimony in support of Int. No. 928- A Local Law to amend the administrative code of the city of New York, in relation to banning personal care products containing microbeads.

NYC Committee on Consumer Affairs
Monday October 26, 2015

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In terms of environmental concerns, microbeads are too tiny to be filtered by wastewater treatment facilities so they are discharged into waterways where they never bio-degrade, adding to the plastic smog within our oceans. Plastic absorbs toxins already present in the water such as PCBs and DDT that are mistaken for food by fish and birds. Once ingested, the pollutants can be transferred from the microbeads into an organism's tissue with adverse effects and can interfere with our food source.

Several manufacturers, including Johnson and Johnson, L'Oréal, Colgate-Palmolive, Proctor and Gamble, and Unilever have already pledged to eliminate microbeads from their products over the next several years. But until then, this bill would get these products off the shelves.

We commend NYC Council members for their leadership and are confident that this bill will influence lawmakers to quickly pass a New York state bill to prevent further harm to public health and the marine environment. Thank you.

NEW YORK CITY AUDUBON

Protecting Wildlife and Habitat for 30 Years

Testimony to the Committee on Consumer Affairs
Susan Elbin, PhD
Director of Conservation and Science, New York City Audubon
October 26, 2015

Thank you, Council Committee Chairperson Espinal and esteemed members of the Committee on Consumer Affairs, for holding this important hearing on plastic microbead legislations.

Based on habitat needs for avian species of conservation concern, New York City Audubon strongly supports Int. No. 928, a local law to amend the administrative code of the city of New York, in relation to banning personal care products containing microbeads. We are also in support of the Governor signing the pre-considered Res. No.A.5896/S.3932, also known as the "Microbead-free Waters Act," which would prohibit the sale of personal cosmetic products containing microbeads.

My name is Dr. Susan Elbin, and I am an ornithologist and the Director of Conservation and Science for the New York City Audubon Society. New York City Audubon is a science-based conservation organization whose mission is to protect wild native birds and their habitat in New York City. We represent 3,000 members and supporters. We are an affiliated chapter of the National Audubon Society, representing an additional 7,000 members in NYC.

Why are we concerned about plastic microbeads, used primarily in cleansers and exfoliants in some personal care products, including facial scrubs, body washes and toothpaste? The simple answer is: water quality. These products are used in conjunction with water, and ultimately wind up being rinsed down the drain. According to the Environmental Protection Agency report from 2003, the fine and very fine screens used in wastewater systems do not adequately remove particles, like microbeads, that are smaller than 200 μm (United States Environmental Protection Agency, 2003). The plastic microbeads end up in rivers, streams, lakes, and oceans. And then they end up in aquatic wildlife.

Plastic debris in the world's oceans and estuaries was first reported in the 1970's. By 2011, the annual global production of plastic has been reported between 230 to 245 million tons. Given that more than half of the world's population lives within 60 miles of the coast, the likelihood is high that the amount of marine plastic will increase.

The next step is the critical one for wildlife. Once microbeads enter the aquatic environment, their buoyancy and persistence within the water column can affect the aquatic food web. According to research done by Cole et. al, in 2011, microbeads may indiscriminately consumed by both pelagic and benthic organisms looking for food.

The widespread presence of microplastics in the waterways is undisputed. Information on the biological impact to marine organisms of microbeads is only just emerging (Barnes et al., 2009; Gregory, 1996; Ryan et al., 2009), and the possibility that microplastics pose a threat to biota is of increasing scientific concern (Barnes et al., 2009; Derraik, 2002; Fendall and Sewell, 2009; Lozano and Mouat, 2009; Ng and Obbard, 2006; Thompson et al., 2004). In addition to the potential adverse effects from ingesting the microplastics themselves, toxic responses could also from contaminants either leaching from the microplastics or adhering to them.

Although plastics are considered to be biochemically inert, additives are typically used to change their properties, making them heat resistant and resistant to degradation by oxidation or microbial action. Polybrominateddiphenyl ethers (possible human carcinogen with proven deleterious effects to non-human thyroid and liver function) and nonylphenol (persistent in the aquatic environment, moderately bioaccumulative, and extremely toxic to aquatic organisms), may leach out of the plastic. Extraneous pollutants have been reported to adhere to the microplastics. Polychlorinated biphenyls (PCBs), PAHs, and organochlorine pesticides (e.g. DDT, DDE), are stable, lipophillic chemicals toxic to wildlife and humans, that will adhere to the surface of plastics, thus producing two mechanism for introducing organic contaminants into the water and into the food web.

Laboratory studies have demonstrated the uptake by marine biota of microplastics (2 μm to 70 μm) and ingestion of very small microbeads (less than 200 μm) can be ingested by filter-feeders, detritivores, deposit feeders, and planktivores (Brown et al. 2007; Fendal and Sewell, 2009). Browne and others (2007) reported on the accumulation of polystyrene microbeads in the gut of mussels (*Mytilus edulis*).

In an overview of marine debris published for the Convention on Biological Diversity (Secretariat of the Convention on Biological Diversity, 2012), it was shown that more than 663 different species were negatively impacted by marine debris with approximately 11% of reported cases specifically related to the ingestion of microplastics. Some species of fish excrete plastic easily, but others do not and so accumulate plastic internally. To cite one study: around 35% of 670 fish examined (total of 6 species) had microplastics in their stomachs. The highest number of fragments found in one fish was 83.

A range of marine wildlife, including seabirds, crustaceans, and fish, have been found to ingest microplastics (Blight and Burger, 1997; Tourinho et al., 2010). Cole et. al (2011) summarized the findings of several researchers: Plastic fragments were first identified in the guts of sea birds in the 1960s, when global plastic production was less than 25 million tons per year (Ryan et al., 2009; Thompson et al., 2009). In 1982, a team in the Netherlands found 94% of fulmars sampled contained plastics, with an average of 34 plastic fragments per individual. Since, incidence and number of fragments consumed has remained high, although the mass of plastic found in each bird has decreased significantly in recent years (Lozano and Mouat, 2009; van Franeker, 2010). Dissection of planktivorous mesopelagic fish, caught in the North Pacific central gyre, revealed microplastics in the guts of 35% of the fish sampled (Boerger et al., 2010). Professor Takada at the University of Tokyo is conducting research that indicates certain persistent organic pollutants (POPs) found in

bird tissue were ingested together with their plastic hosts. Scientists working in this field hypothesize that over time, POPs will start accumulating in the food chain, transferring from species to species, with consequences ultimately for humans.

For those products that rely on abrasive mechanical action to be effective, there are safer alternatives. Many personal care product companies have voluntarily phased out the use of plastic microbeads in their products, and other companies are expected to follow suit.. Ceramic microspheres made from amorphous magnesium silicate are commercially available and used in cosmetics formulations. A truly biodegradable microbead could be engineered. Or naturally occurring material could be used, such as almond shells and jojoba oil.

In summary, microbeads, when flushed into our sewers and rivers, pose a significant threat to wild birds. For the most part, these small plastic beads persist in the environment and do not biodegrade--and their biological impacts are many. Birds that fill their stomachs with plastic feel like they are 'full,' even as they starve to death from a lack of the nutrients that they need. Microbeads also attract and absorb persistent organic pollutants (such as PCBs); birds that consume the beads therefore not only fill up on plastic, they poison themselves. Many waterbirds eat fish, also likely consumers of microbeads. Those waterbirds, then, are consuming an even greater amount of toxins through bioaccumulation. New York City, a city of water, provides important habitat for more than 350 species of both resident and migratory birds, many of which feed on aquatic resources. Banning the sale of microbeads in the five boroughs will make a difference to the survival of New York City's wild birds. New York City Audubon applauds the efforts of Councilman Daniel Garodnick in drafting this legislation to protect the waterways of New York City by championing microbead-free legislation.

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Testimony of
Nicole Robinson-Etienne
Assistant Director, Government and Community Affairs
Wildlife Conservation Society / NY Aquarium
before the
New York City Council Committee on Consumer Affairs
October 26, 2015

Thank you for the opportunity to testify regarding the sale of personal care products containing microbeads in New York City and the important role of Int. 928, the New York City Waterway Protection Act of 2015, to address concerns of plastic pollution in our waters.

My organization, the Wildlife Conservation Society, saves wildlife and wild places worldwide through science, conservation action, education, and inspiring people to value nature. To achieve our mission, we harness the power of our Global Conservation Program in nearly 60 countries and the world's oceans, and in our five New York City-based wildlife parks, including our Bronx Zoo headquarters and soon-to-be state-of-the art New York Aquarium, along with partners from across the globe. WCS combines its expertise in the field, zoos, and aquarium to achieve its conservation mission with the aim of conserve the world's largest wild places in 15 priority regions, home to more than 50 percent of the world's biodiversity. One of the fifteen regions includes the New York Seascape, which consists of the coasts and seas of the mid-Atlantic.

In an effort to support the New York Seascape, we recently launched the Blue York Campaign which strives to: develop an ocean ethic for the waters surrounding New York City; protect our ocean wildlife and wild places; and decrease pollution in these waters.

Plastic microbeads are an ingredient, that in recent years have been added to a variety of cosmetics and personal care products for their abrasive and aesthetic properties in products like face wash and toothpaste. Microbeads are small bits of plastic, often measuring at a millimeter or smaller, that are used and then washed down the drain. Many wastewater treatment plants are not designed to filter out particles this small, thus the microbeads make it through the treatment plants and into waterways. Two-thirds of NY's sewage treatment plants do not have advanced treatment technology needed to remove microbeads. Researchers estimate that a single product can contain as many as 350,000 plastic microbeads.

Scientists have discovered high levels of microbeads in waterways throughout New York and the country, which means trouble for wildlife and humans. In New York State alone, 19 tons of microbeads are washed down the drain every year. By their nature, microbeads have chemicals in the plastic. Additionally, chemicals also collect other pollutants on their surfaces from the waters they are submerged in, including DDT and polychlorinated biphenyls (PCBs), which are highly toxic to living organisms. The particles are then ingested by wildlife, which mistake the microbeads for food, and become part of the food chain as larger animals eat the smaller ones.

We know that many large companies such as Procter & Gamble, Johnson & Johnson, and L'Oreal have already or are beginning to phase out the use of microbeads in their products. A strong ban is still necessary to make sure microbead-laden products are completely off the shelves and that there are no loopholes that will still allow for microbeads to enter New York's waters. We have seen other states pass bills that exempt so-called "biodegradable" microbeads. One of our scientists, Dr. Emily Darling, has referenced this issue directly in a paper she completed with several other colleagues entitled, "Scientific Evidence Supports a Ban on Microbeads."

This paper cites that microbead bans, like the one enacted in Illinois that defines "plastic" as something that retains its "defined shape during life cycle and after disposal," allow microbeads to be made from plastics that biodegrade only slightly, thus changing their defined shape in an unspecified time period. Studies have shown that depending on the environment that these supposedly biodegradable products end up, the rate at which they actually break down is very uncertain. We do know that it is difficult for plastics to break down in aquatic environments.

Through Int. 928, New York City has the opportunity to take a strong, uncompromising stand to ban the sale of products containing microbeads. We have circulated a sign-on letter to the entire City Council representing support for this bill that includes signatories from 28 environmental and conservation groups. Please keep the bill strong so we can set a precedent in New York City that can be emulated in Albany and across the country.

Overview: Great Lakes Plastic Pollution Survey

Sherri A. Mason, Ph. D.

Quick Introduction of the Author

Dr. Sherri A. Mason earned her bachelor's degree from the University of Texas at Austin. She completed her doctorate in Chemistry at the University of Montana as a NASA Earth System Science scholar. She is currently a Full Professor in the Department of Chemistry and Biochemistry at the State University of New York at Fredonia. Though her background is in atmospheric chemistry, her research group is now poised at the forefront of research on plastic pollution. As co-PI on the first-ever survey for plastic pollution within the open waters of the (Laurentian) Great Lakes, her research group is among the first to study the prevalence and impact of plastic pollution within freshwater ecosystems and, as such, has been featured within hundreds of mass media articles including the *New York Times*, the *Huffington Post*, and National Public Radio's *All Things Considered*.

The most important take-home messages from our work to-date:

1. **Microplastics are the dominant type of plastic pollution in the Great Lakes.**
2. **Microbeads constitute 20% of this microplastic.**
3. **Microplastics escape wastewater treatment plants.**
4. **Plastics are mixtures, which leach component chemicals.**
5. **Plastics are "magnets" for chemicals in the water.**
6. **Microplastics are ingested by aquatic organisms, including fish.**

Additional details on each of the points above are given below:

1. **Microplastics (<5mm in size) are the dominant type of plastic pollution in the Great Lakes.** Most plastics found in the aqueous environment start out as larger objects you would easily recognize, like plastic bags and toothbrushes, but plastic doesn't biodegrade, it photodegrades. That means that over time, they don't serve as a food source for some microorganism and just "go away,' rather they fragment into smaller and smaller pieces. NOAA has defined any plastic particle less than 5mm as a 'microplastics.' Our surveys have found that more than 75% of the plastic pollution within the Great Lakes are microplastics, particles the size of a grain of sand or the period at the end of this sentence. Too small to really be seen once in the water.
2. **Microbeads constitute 20% of this microplastic.** While personal care products incorporate both plastic fragments and spherical balls of plastic, we can use the spherical balls of plastic as indicators of this particular source of microplastic. Our numbers and analysis indicates that ~15-20% of the microplastics we find are owing to this one particular source.
3. **Microplastics (including microbeads and microfibers) escape wastewater treatment plants**. Our research lab has tested the post-processing effluent from 10 wastewater treatment facilities in the Great Lakes region, as well as collaborating with the New York State Attorney General's office to specifically look for microbeads within the effluent of 34 additional facilities throughout New York State. All of the facilities we tested had microplastics within their effluent, and 75% of those tested by the NYS AG had microbeads. Taken together, over 80 % of the facilities tested showed evidence of microbeads escaping their facilities into NYS waters, with average releases of over 4 MILLION microparticles per facility *every day*.

4. **Plastics are mixtures, which leach component chemicals.** Plastics are polymers. Polymers have long, strong molecular bonds that keep plastics from biodegrading, and are what make plastics strong and flexible. But if you want your plastic to be UV resistant, colored, extra flexible, or give it other properties, you mix-in chemical additives. These chemicals are small molecular weight species, which are not chemically bonded to the polymers allowing them to leach and off-gas. You'll see this in everyday plastics; as they get old and lose these chemical additives, they also lose color and get brittle. Most plastics leach endocrine disrupting chemicals that interfere with animal and human hormone systems. Most water treatment systems don't take these kinds of chemicals out of the water.
5. **Plastics are "magnets" for chemicals in the water**. On top of leaching chemical additives, plastics can absorb over a million times more chemicals to their surface than exists in the surrounding water, making them very toxic. If you've ever done dishes after eating leftover spaghetti or curry, you know that orange color that's so hard to scrub off plastic Tupperware. That is an example of how oily substances are attracted to plastics. Absorbed chemicals include PCBs, PAHs, and other persistent organic pollutants (POPs).
6. **Microplastics are ingested by aquatic organisms, including fish**. The problem with microplastics is that they are ingested by a wide variety of aquatic life. Some are so small they can be eaten by plankton or circulate in the blood of mussels. Our studies have found microplastics within all 25 species of fish, as well as the double-crested cormorant (a fish-eating water fowl), that we tested. Because of the chemical adsorption and leaching properties of plastics (see 4 & 5 above) scientists have nicknamed microplastics "poison pills" because when an animal eats the plastic, the chemicals move into its body as well. These chemicals also become more concentrated as they move up the food chain (biomagnification).

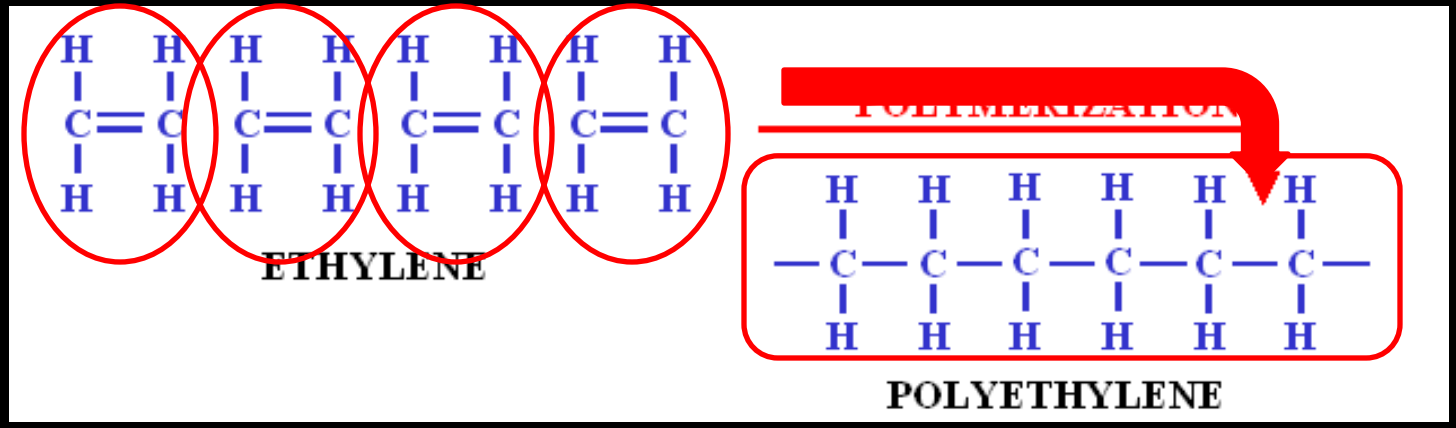
Two points I would like to add:

1. **Technological fixes for systemic problems usually lead to more problems**. Grand technological gestures (such as changing the wastewater treatment process or 'cleaning up' the pollution) in the face of massive systemic problems like plastic pollution makes it feel as though action is possible. It's doing *something.* But such technological fixes for long term systemic problems usually lead to their own problematic ripple effects. These are called "wicked problems" and they account for most large scale environmental and urban planning problems. We need to step away from technical fixes and focus on larger systemic approaches that incorporate the bigger players, like industry. We need to focus on the source of the issue.
2. **"Microbeads haven't been proven to be harmful**." One of the common tools used by industry to rationalize *inaction* is the burden of proof. It is true that microbeads haven't been proven to be harmful, but they also haven't been proven to be safe. This is because until our study nobody had even really thought about them at all so no studies have been conducted specifically on microbeads. However, lots of studies have shown that microplastics negatively impact living organisms and it is safe to extrapolate from those studies to microbeads. Further, we really should follow the precautionary principal: Products should not be allowed to be sold UNTIL they are proven safe. It should not be our burden to prove that a product isn't safe in order to have it taken off the shelf, when by then the damage has already been done.

Great Lakes Plastic Pollution Survey

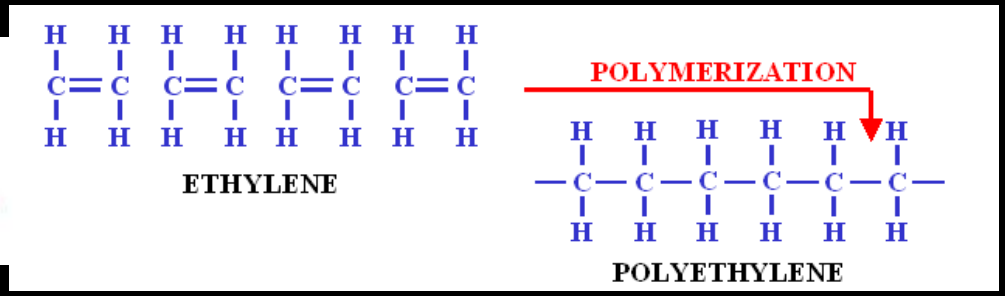
Dr. Sherri "Sam" Mason
SUNY Fredonia
Chemistry/Environmental Sciences

- Synthetic polymers



- Versatile, Light-weight, Durable

DOESN'T BIODEGRADE!



- Birth
  - Celluloid – 1862 (1870)
    - first semi-synthetic plastic
  - Bakelite – December 7, 1909
    - first U.S. patent for a synthetic plastic
- World War II

1955

LIFE Magazine “Throwaway Living”

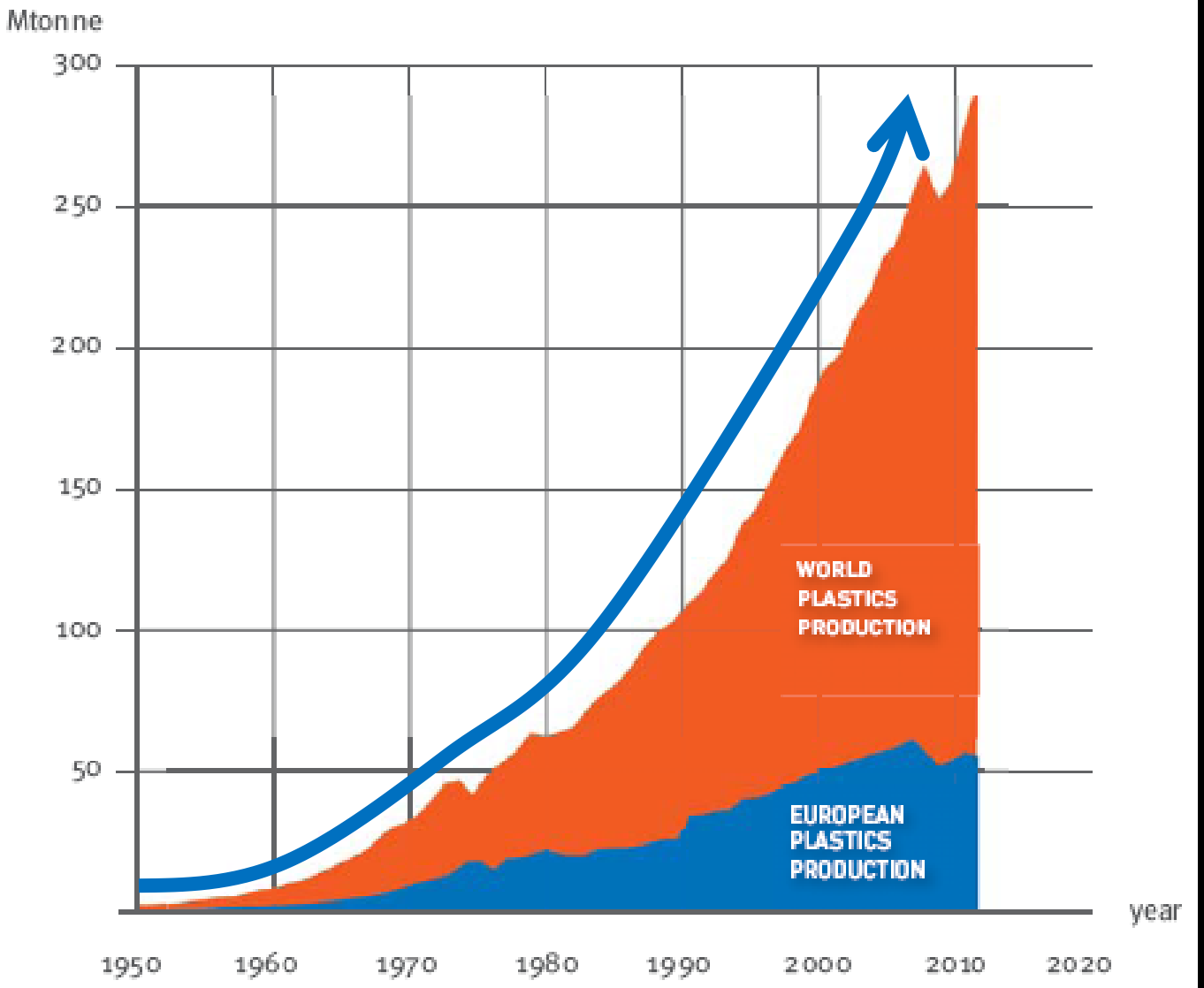
Throwaway Living

DISPOSABLE ITEMS CUT DOWN HOUSEHOLD CHORES

DISPOSABLE ITEMS CUT DOWN HOUSEHOLD CHORES

World plastics production grows

1950	1976	1989	2002	2009	2010	2011	2012
1,7	47	99	204	250	270	280	288



Where does it go?

- *~50% landfill*
- *<10% recycled*
- *"unaccounted for"*

Source:
PlasticsEurope,
Plastics – The Facts 2013


Superior
Huron
Michigan
Ontario
Erie

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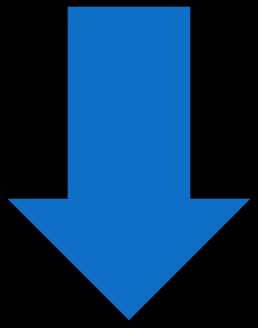
Lake Huron sample with plastic from a cigarette pack

Photos courtesy of Tim Hoellein

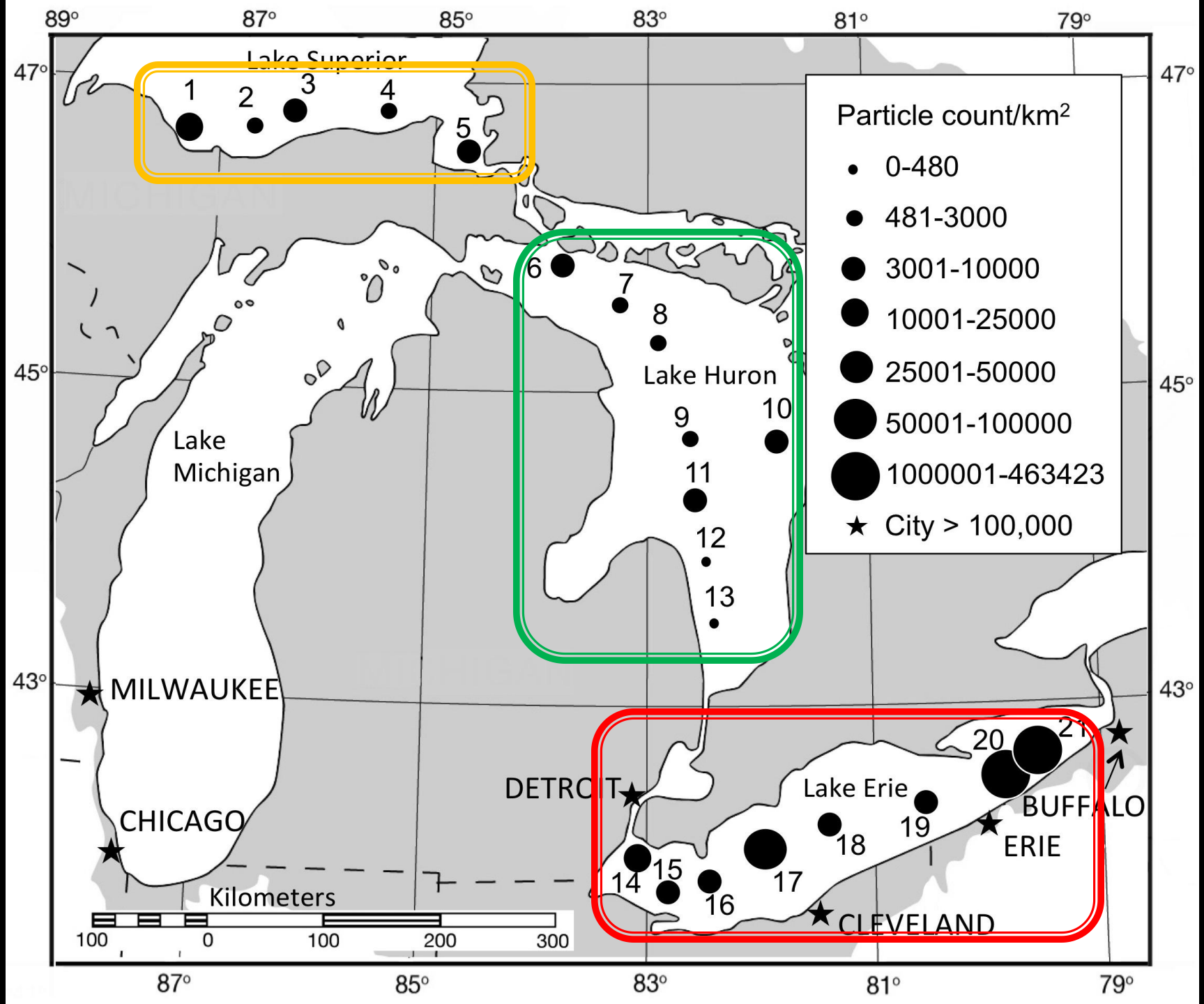
Extrapolate



Particles per Square Kilometer

(Plastic Abundance)

2012

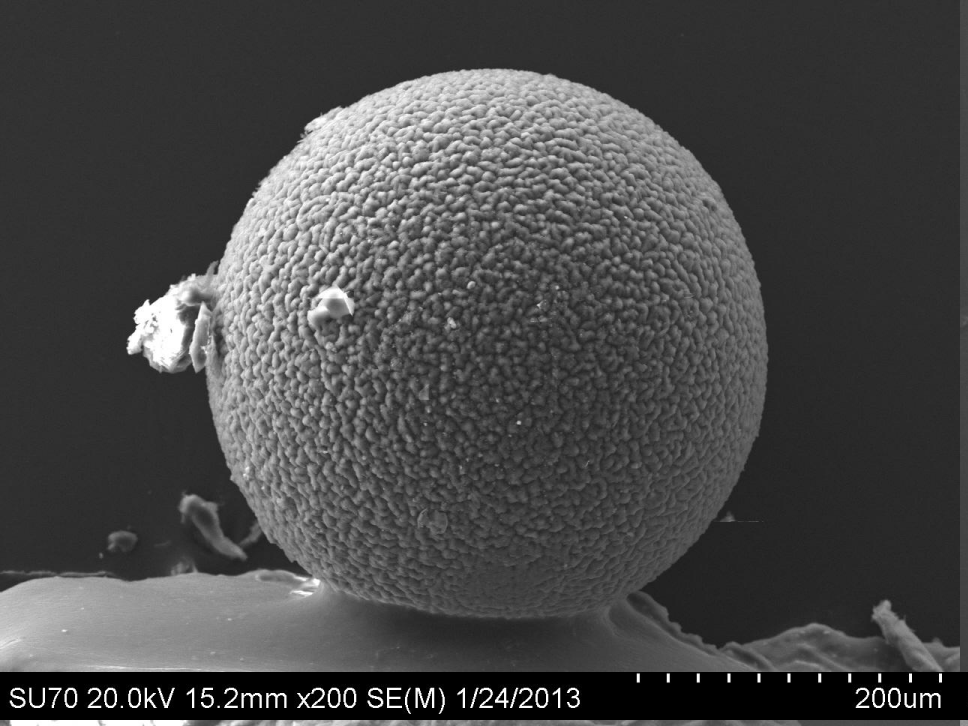

89°
87°
85°
83°
81°
79°
47°
45°
43°
Lake Superior
1
2
3
4
5
6
7
8
9
10
11
12
13
Lake Huron
Lake Michigan
MILWAUKEE
CHICAGO
DETROIT
Lake Erie
BUFFALO
ERIE
CLEVELAND
14
15
16
17
18
19
20
21
Particle count/km2
0-480
481-3000
3001-10000
10001-25000
25001-50000
50001-100000
1000001-463423
City > 100,000
Kilometers
100
0
100
200
300

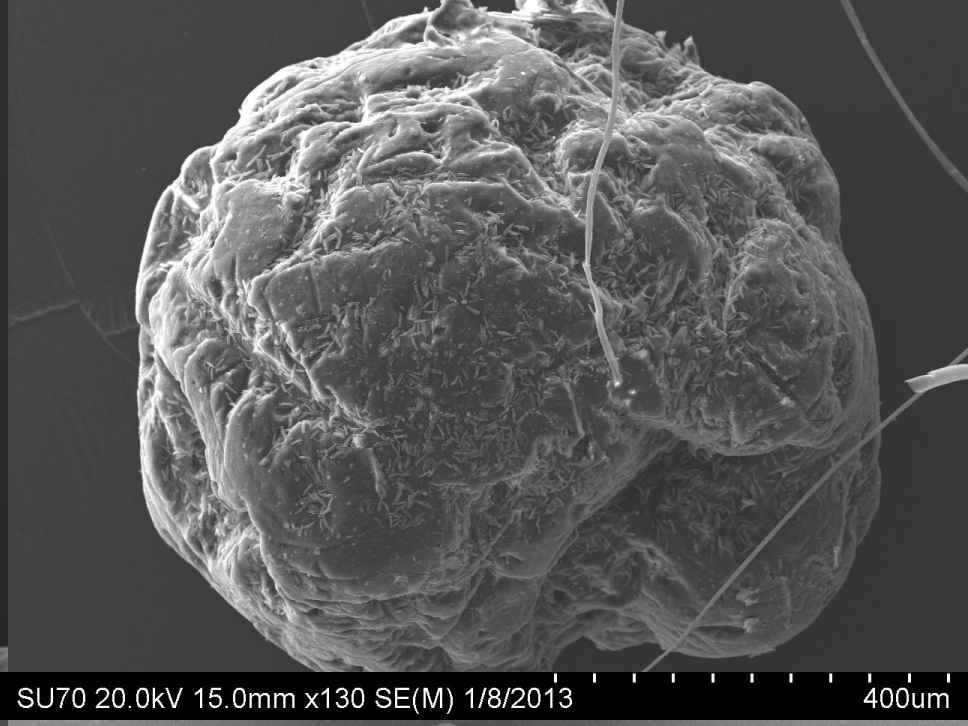
Abundance of plastic pieces (count/km2) by type and size

	0.355—0.999mm	1.000—4.749mm	> 4.75mm
Fragment	247,106.5	123,906.2	11,219.8
Pellet	430,029.8	5,614.1	420.9
Fiber/Line	1,328.9	2,571.9	449.0
Film	3,943.5	1,332.2	4,006.1
Foam	54,340.9	18,208.4	1,810.5
count/km^2	736,749.6	151,632.9	17,906.3
% of total	81%	17%	2%

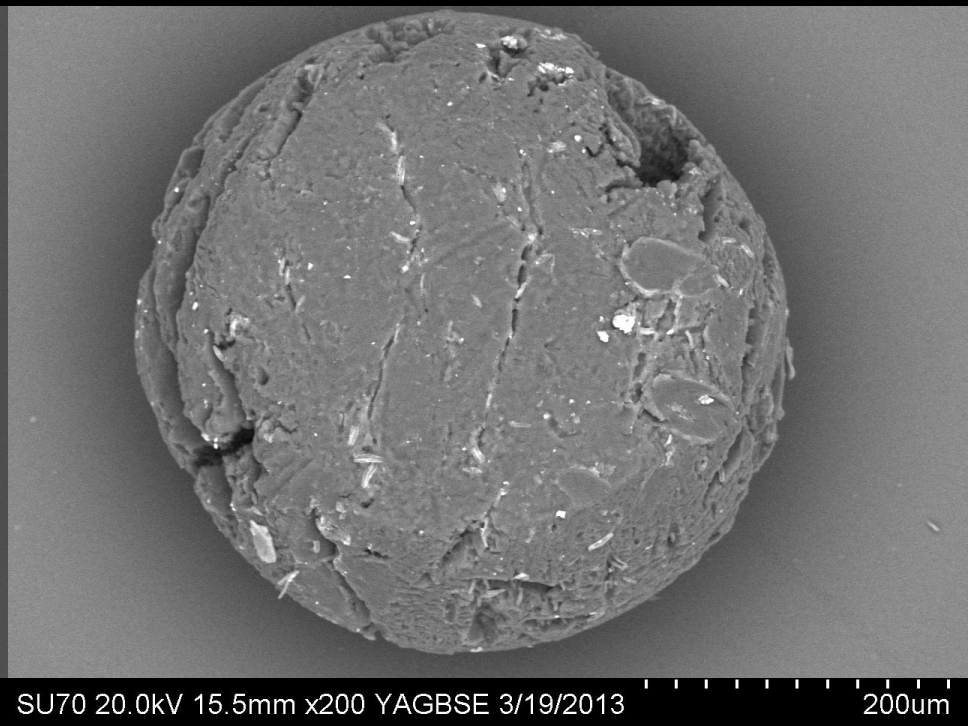
MANTA #20 LAKE ERIE

.355-1mm


SU70 20.0kV 15.2mm x200 SE(M) 1/24/2013
200um


SU70 20.0kV 15.0mm x130 SE(M) 1/8/2013
400um


SU70 20.0kV 15.1mm x200 SE(M) 1/8/2013
200um


SU70 20.0kV 15.5mm x200 YAGBSE 3/19/2013
200um

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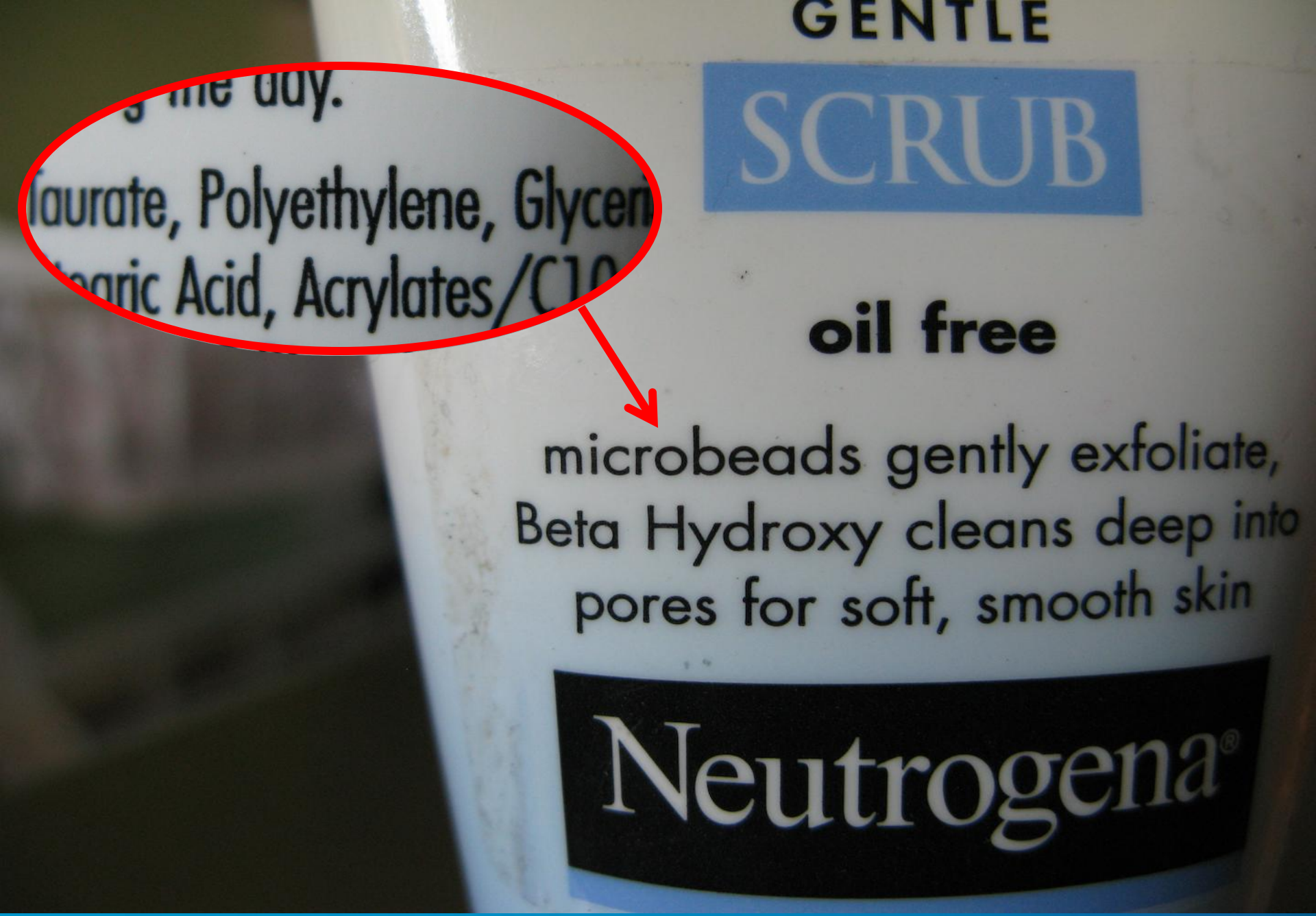
POSSIBLE SOURCE OF MICROPLASTIC SPHERES



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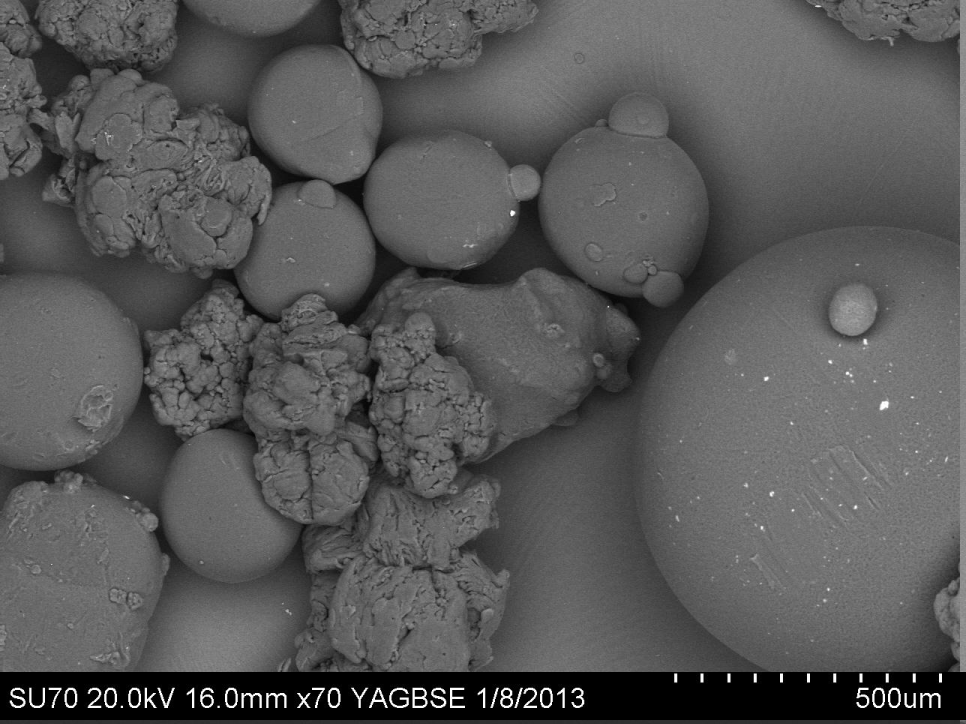
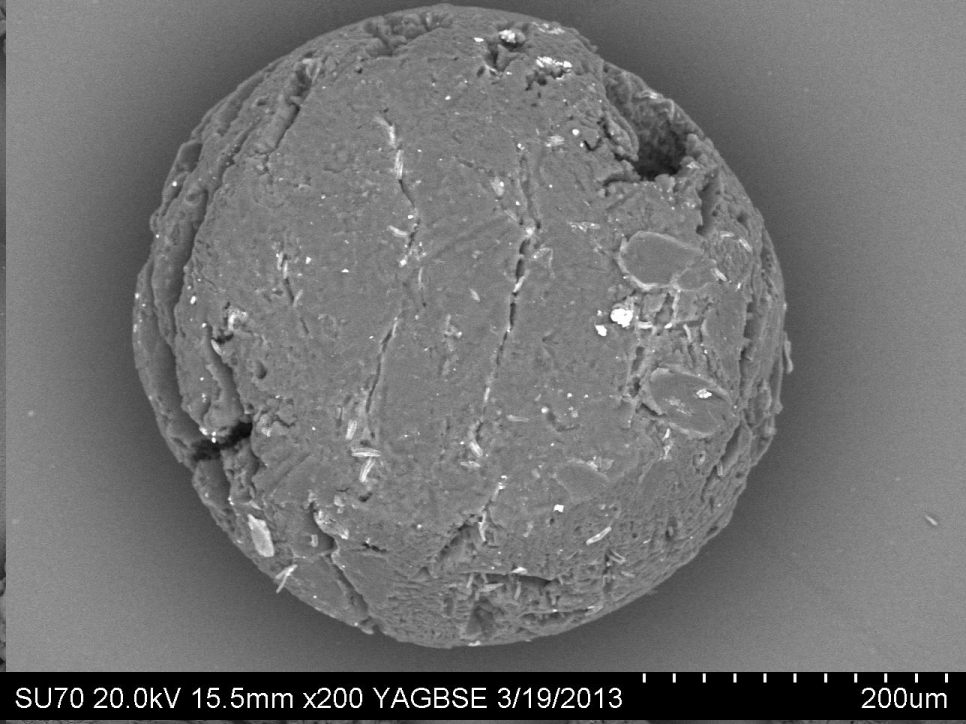
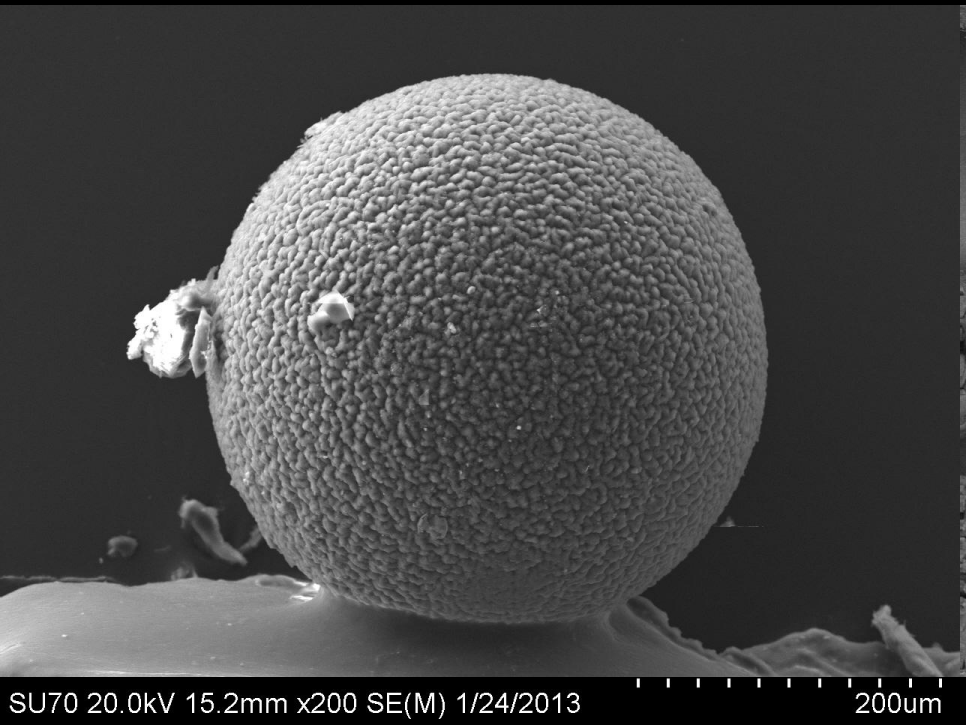
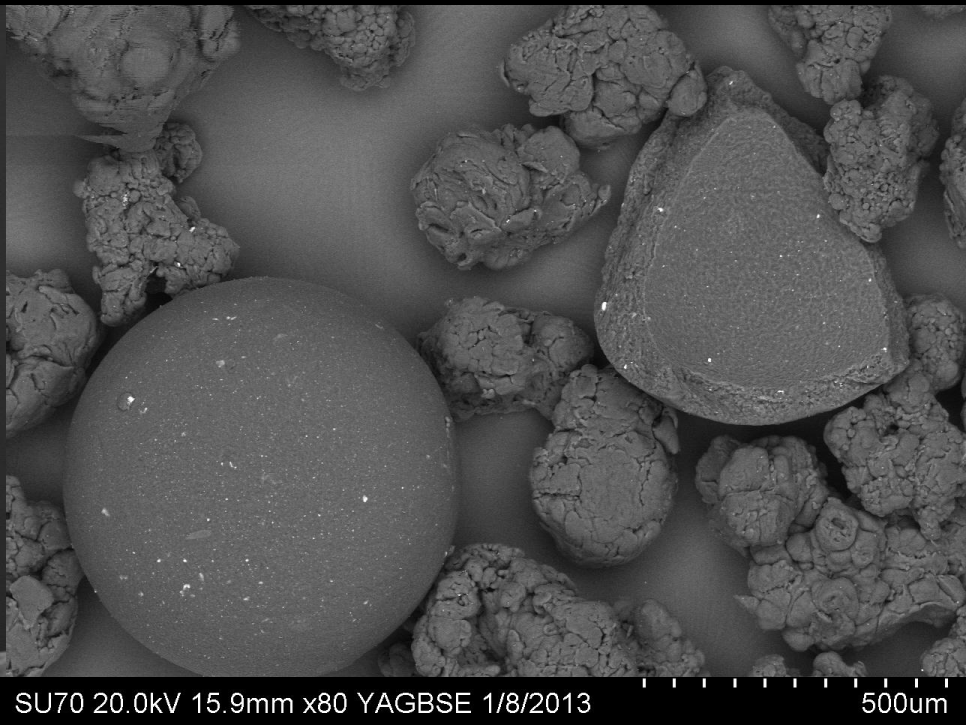
POSSIBLE SOURCE OF MICROPLASTIC SPHERES


SU70 20.0kV 16.0mm x70 YAGBSE 1/8/2013
500um

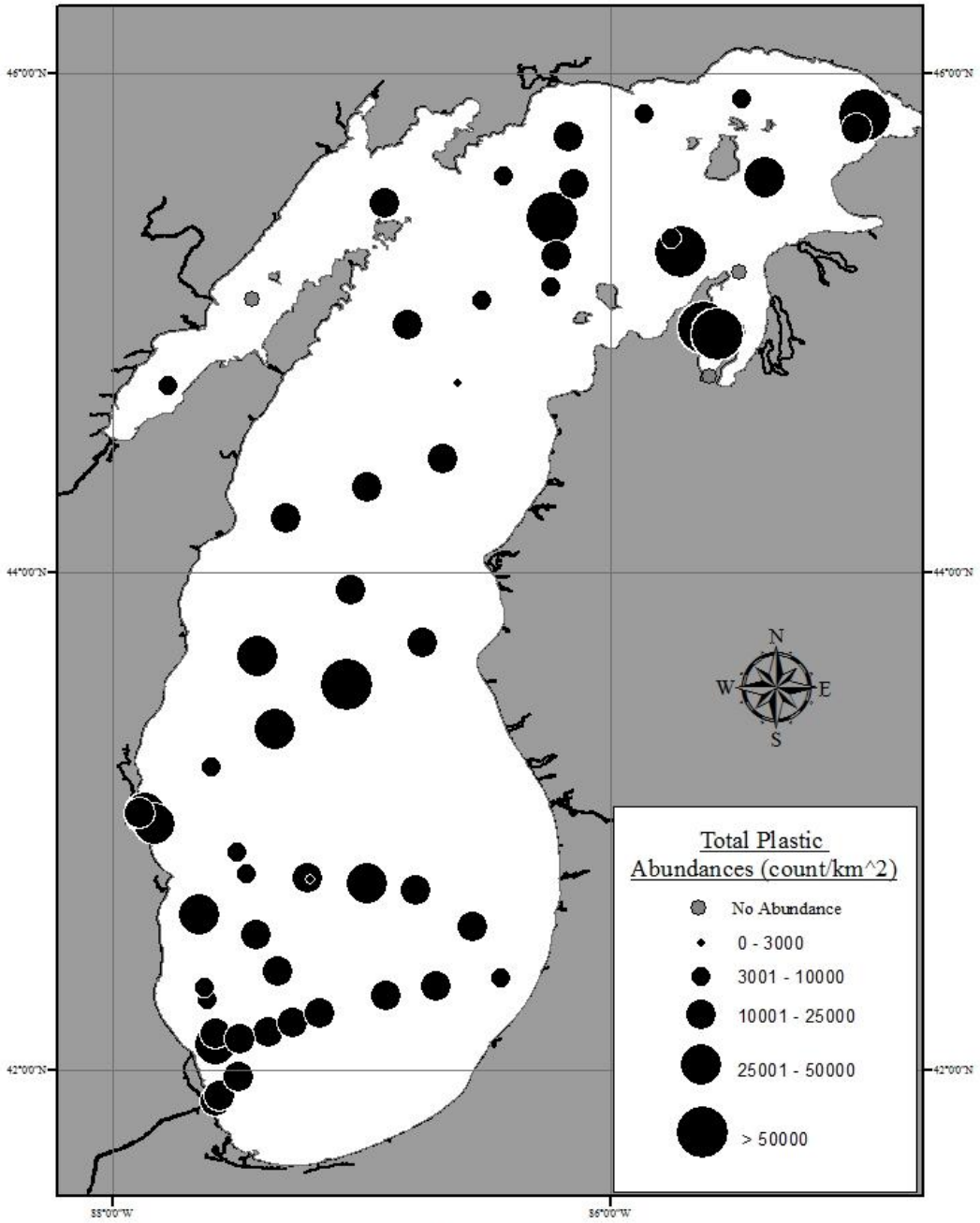

SU70 20.0kV 15.5mm x200 YAGBSE 3/19/2013
200um


SU70 20.0kV 15.2mm x200 SE(M) 1/24/2013
200um


SU70 20.0kV 15.9mm x80 YAGBSE 1/8/2013
500um

2013

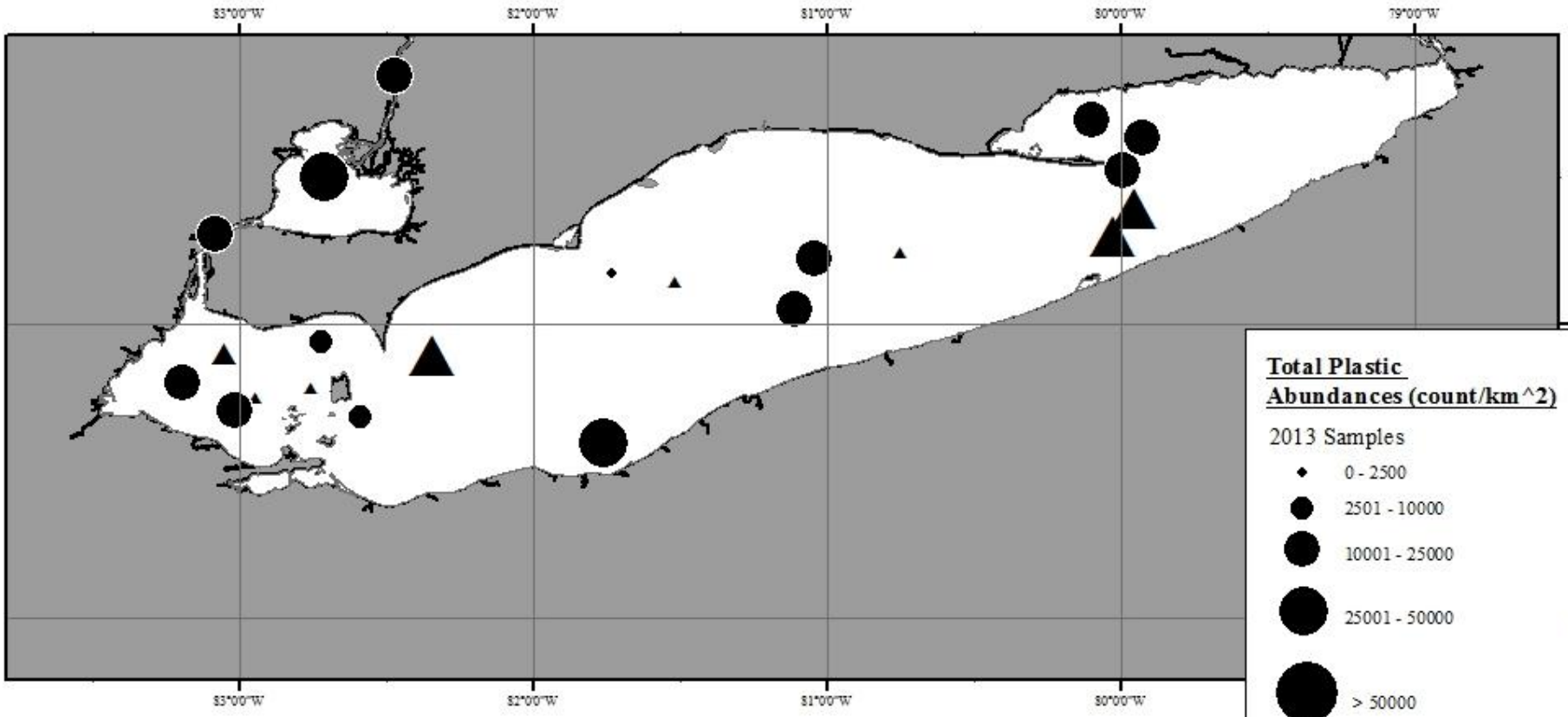
2013 Lake Michigan Open Water Samples



By: Nicholas Williamson April 23, 2014

Sources: Great Lakes GIS & NOAA glgis Great Lakes shore noaa 70k, GLIN Published: 2006-12-20

Lake Erie 2012 & 2013 Open Water Samples



By: Nicholas Williamson April 23, 2014

Total Plastic Abundances (count/km^2)

2013 Samples
- 0 - 2500
- 2501 - 10000
- 10001 - 25000
- 25001 - 50000
- > 50000

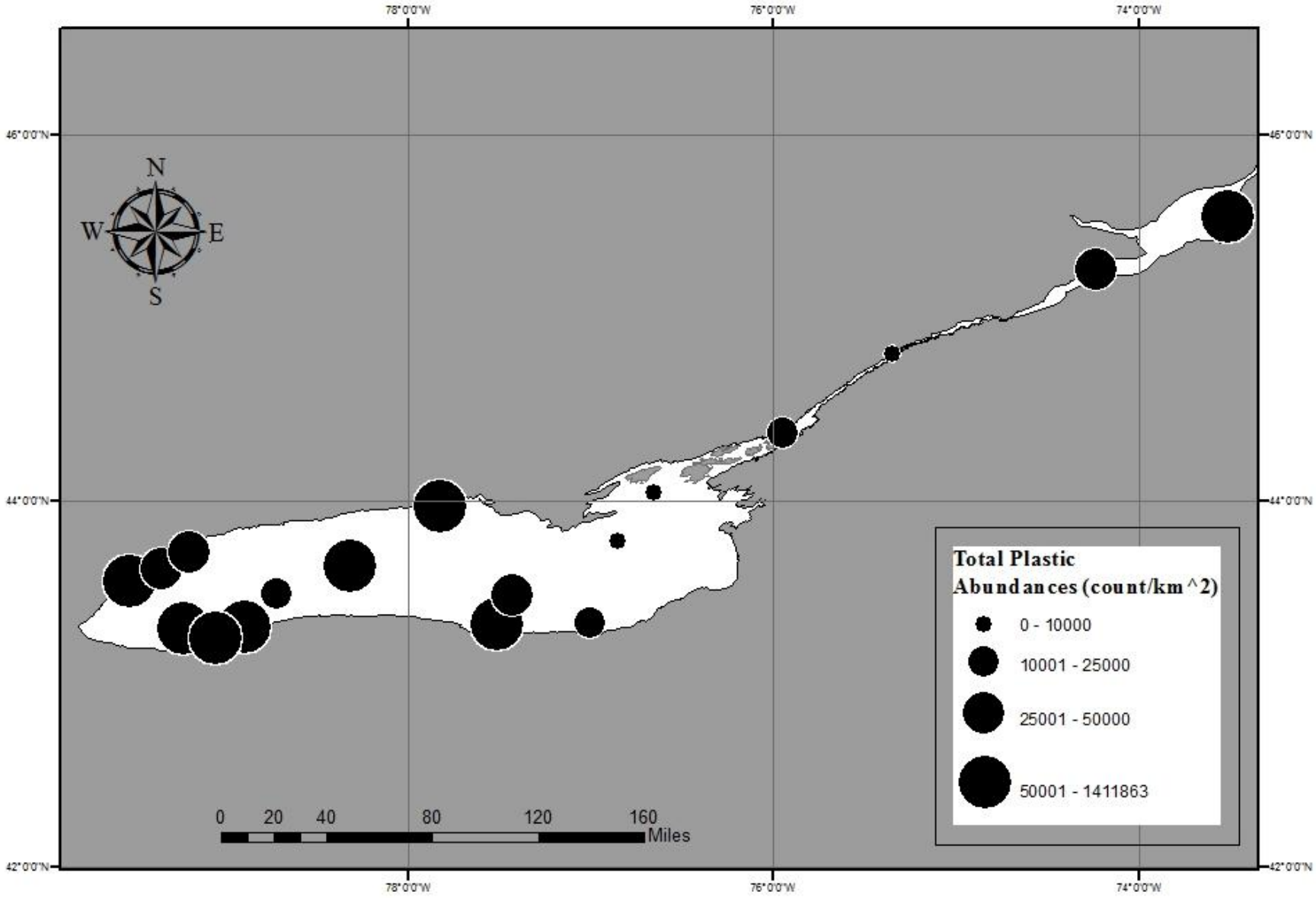
2012 Samples
- 0 - 10000
- 10001 - 20000
- 20001 - 50000
- 50001 - 500000

N
W E
S

0 0.25 0.5 1 1.5 2 Miles

Sources: Great Lakes GIS & NOAA glgis Great Lakes shore noaa 70k. GLIN Published: 2006-12-20

Lake Ontario 2013 Open Water Samples



By: Nicholas Williamson Date: May 16, 2014

Sources: Great Lakes GIS & NOAA glgis Great Lakes shore noaa 70k. GLIN Published: 2006-12-20

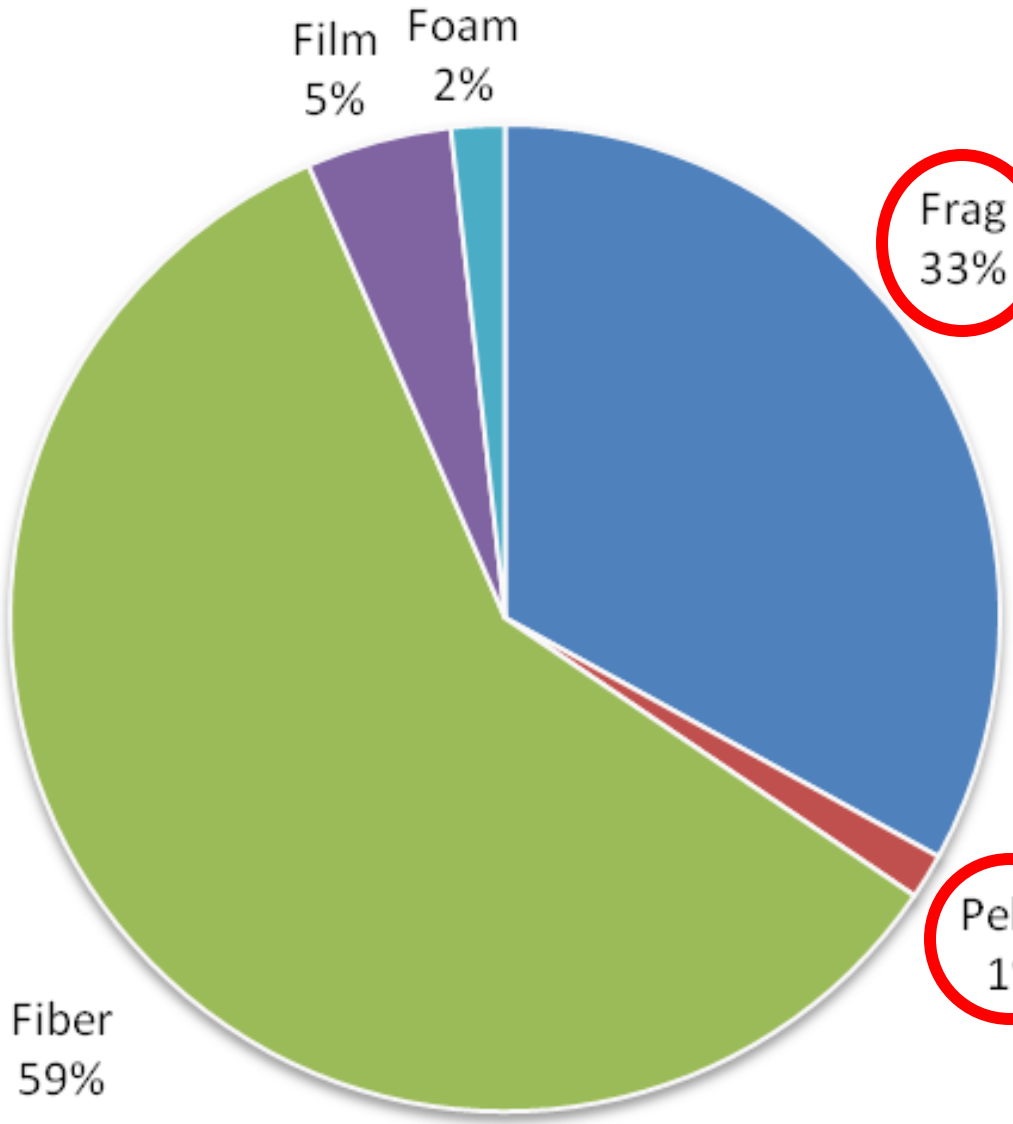
Combined Data – 2012 & 2013

Abundance of plastic pieces (count/km2)
by type and size

	0.355—0.999mm	1.000—4.749mm	> 4.75mm
Fragment	3,356,920.6	1,586,137.1	127,199.3
Pellet	920,457.4	78,815.0	4,999.6
Fiber/Line	119,116.3	94,004.7	67,245.2
Film	41,419.4	61,030.4	31,772.5
Foam	72,501.5	136,444.3	18,028.9
count/km^2	4,510,415.2	1,956,431.5	249,245.6
% of total	67%	29%	4%

Wastewater Treatment Plant Study

Overall (f=17; s=90)

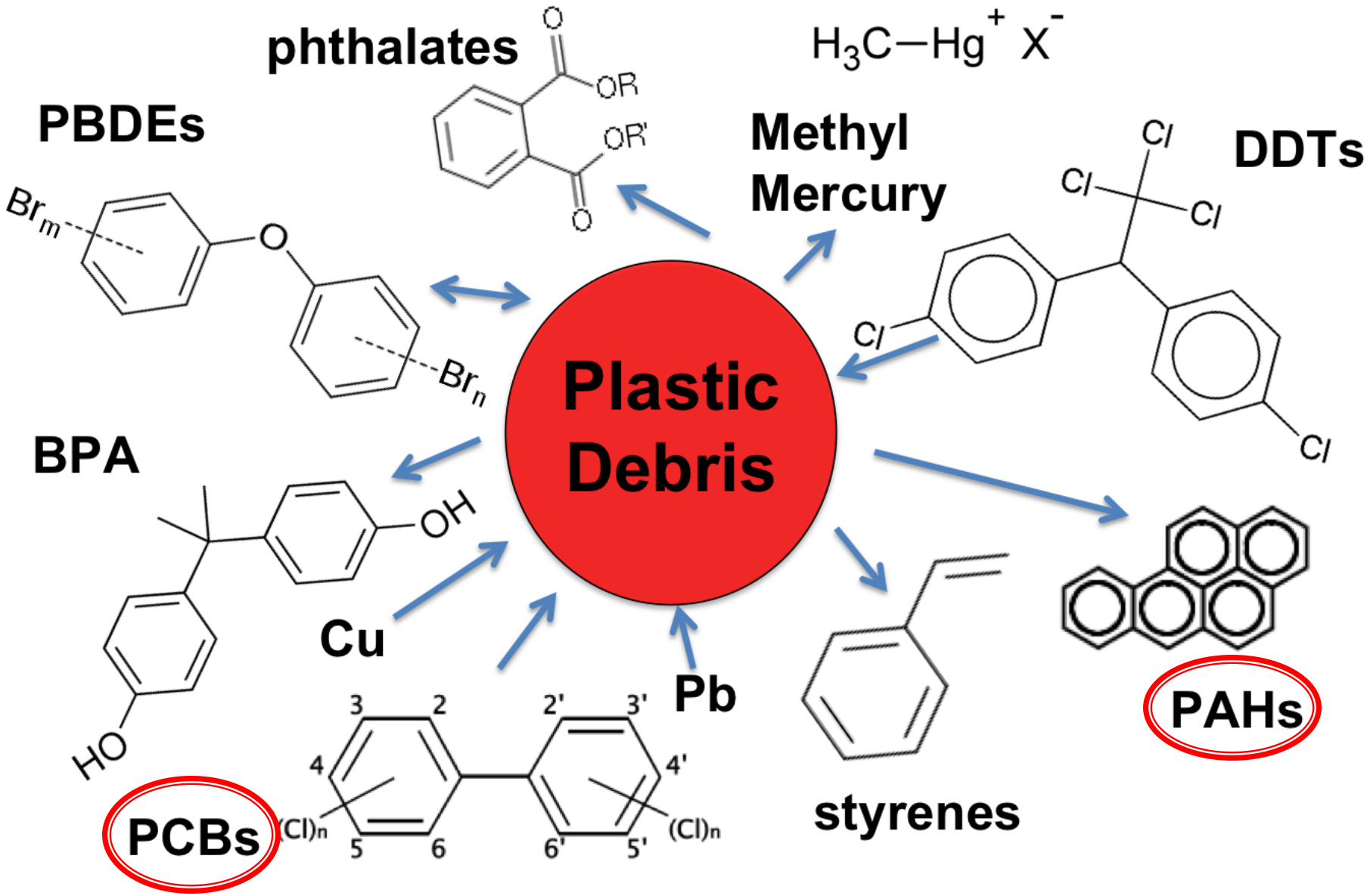


Average Number of Plastic Particles	
per gallon	per day
0.737	456,691
0.037	64,473
0.033	101,343
0.013	52,762
0.029	118,706
0.177	1,237,133
0.241	2,045,092
0.350	4,134,574
0.482	9,625,335
0.160	4,768,297
0.273	8,086,115
0.270	12,433,886
0.082	4,105,857
0.072	4,078,889
0.027	2,251,501
0.180	14,916,649
0.064	6,053,689
0.190	4,384,176

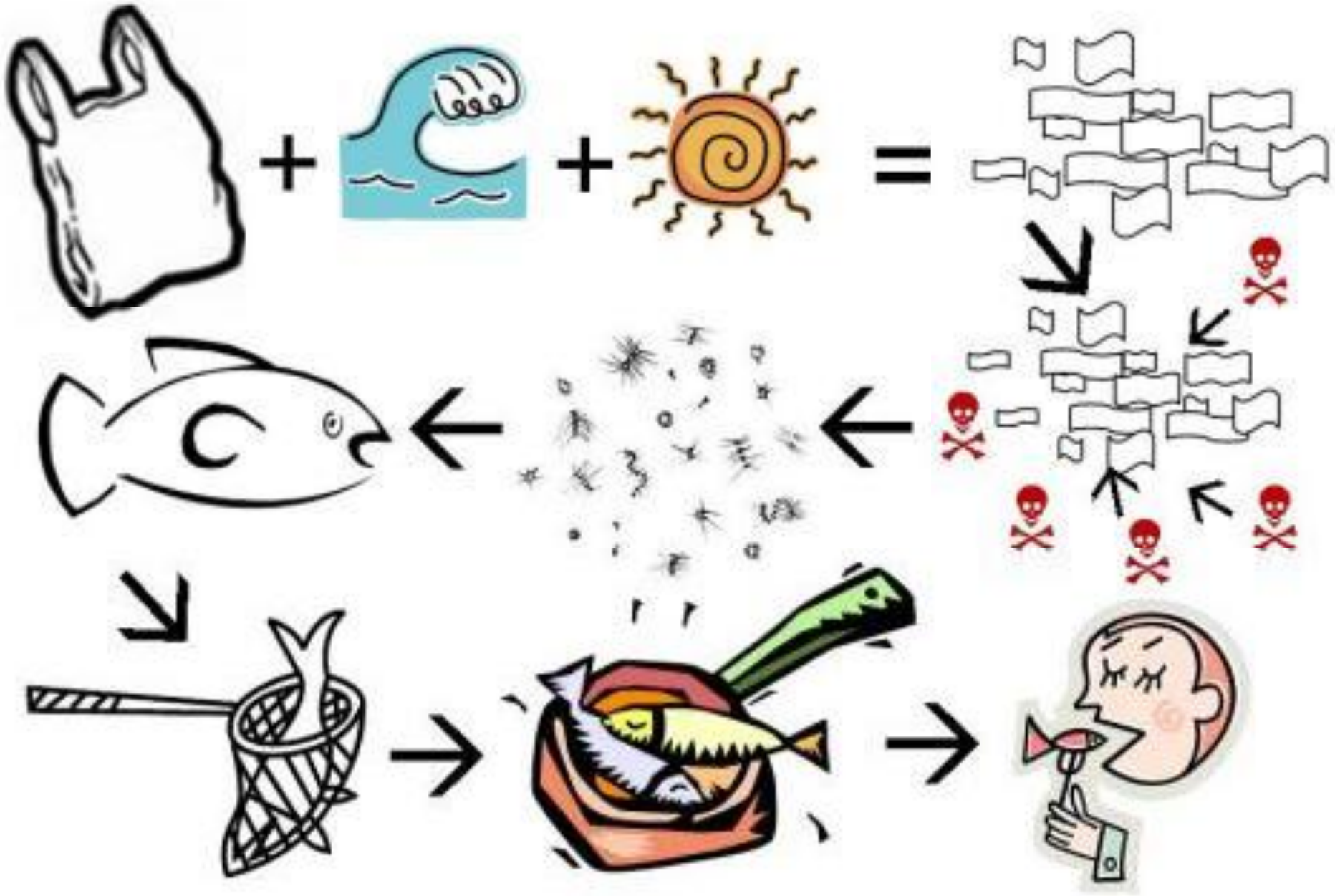
2-20 billion per day!

Why do we care?

“Cocktail” of Chemical Contaminants



Visual courtesy of Chelsea Rochman



Visual courtesy of Sierra Club – Delaware Chapter

Food Web Study

Preliminary Results

Species to Date

Bloater
Brown Trout
Cisco
Common Shiner
Creek Chub
Double-crested Cormorant
Emerald Shiners
Golden Redhorse
Kiyi
Lake Trout
Logperch
Longnose Dace
Sand Shiner
Smelt
Spotfin Shiner
Walleye
White Bass
Yellow Perch

Total: 18

Species to Due

Burbot

Smallmouth bass

White Bass

Blue Gill

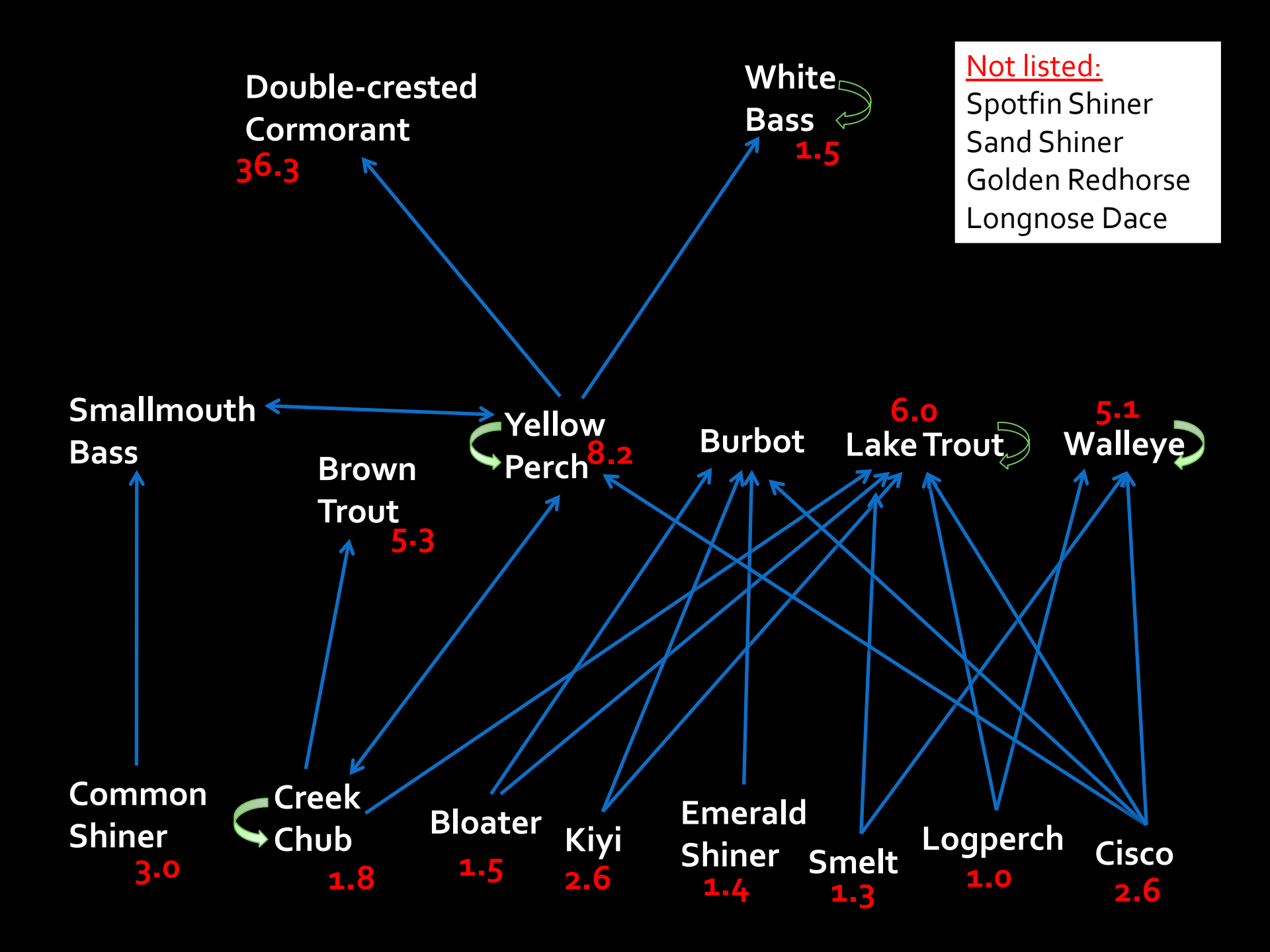
Gizzard Shad

Green Sunfish

Northern Pike

White Sucker

Total: 8


Double-crested Cormorant
36.3
White Bass
1.5
Not listed:
Spotfin Shiner
Sand Shiner
Golden Redhorse
Longnose Dace
Smallmouth Bass
Yellow Perch
8.2
Brown Trout
5.3
Burbot
6.0
Lake Trout
5.1
Walleye
Common Shiner
3.0
Creek Chub
1.8
Bloater
1.5
Kiyi
2.6
Emerald Shiner
1.4
Smelt
1.3
Logperch
1.0
Cisco
2.6


We Are
Water

What Does Water do for You?

Needed by the brain to manufacture hormones and neurotransmitters

Forms saliva (digestion)

Keeps mucousal membranes moist

Regulates body temperature (sweating and respiration)

Allows body's cells to grow, reproduce and survive

Acts as a shock absorber for brain and spinal cord

Flushes body waste, mainly in urine

Converts food to components needed for survival - digestion

Lubricates joints

Water is the major component of most body parts

Helps deliver oxygen all over the body

IF IT'S IN THE WATER, IT'S IN US.

Questions?

Photo courtesy of Brendan Bannon

Thank You!

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FREDONIA
STATE UNIVERSITY OF NEW YORK

THE BURNING RIVER FOUNDATION

ILLINOIS – INDIANA SEA GRANT

THE GREAT LAKES SCHOOLSHIP
INLAND SEAS EDUCATION ASSOCIATION
INLAND SEAS EDUCATION CENTER

SAVE THE RIVER
Upper St. Lawrence RIVERKEEPER

PANGAEA EXPLORATION
exploration - education - conservation

- Susan Gateley
- Ghadah Aleid

- Hannah Farley
- Nick Williamson
- Morgan Smith
- Rachel Ricotta
- Parker Fink

Solutions

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POSSIBLE SOURCE OF MICROPLASTIC SPHERES

Plastic in Personal Care Products

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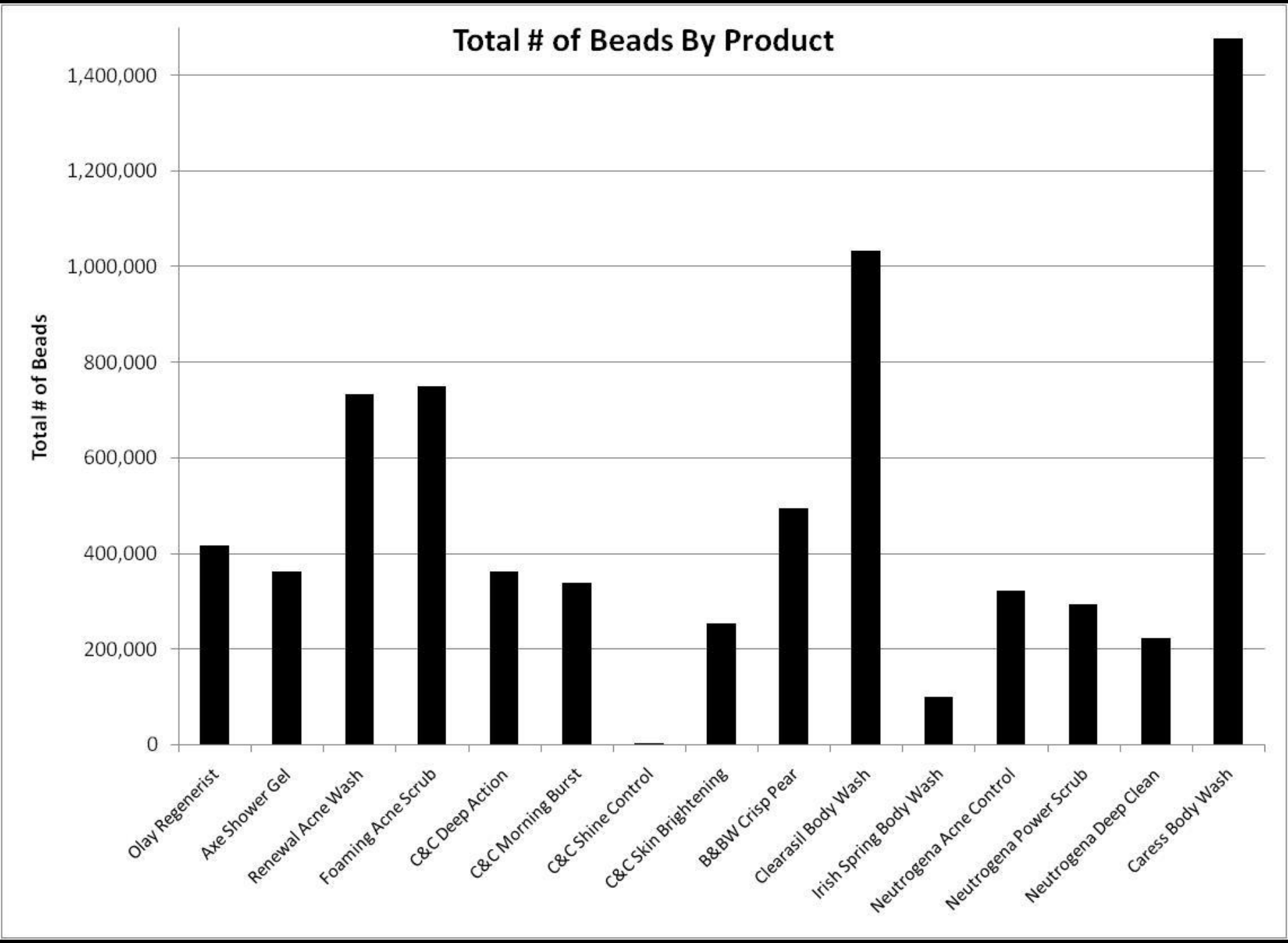
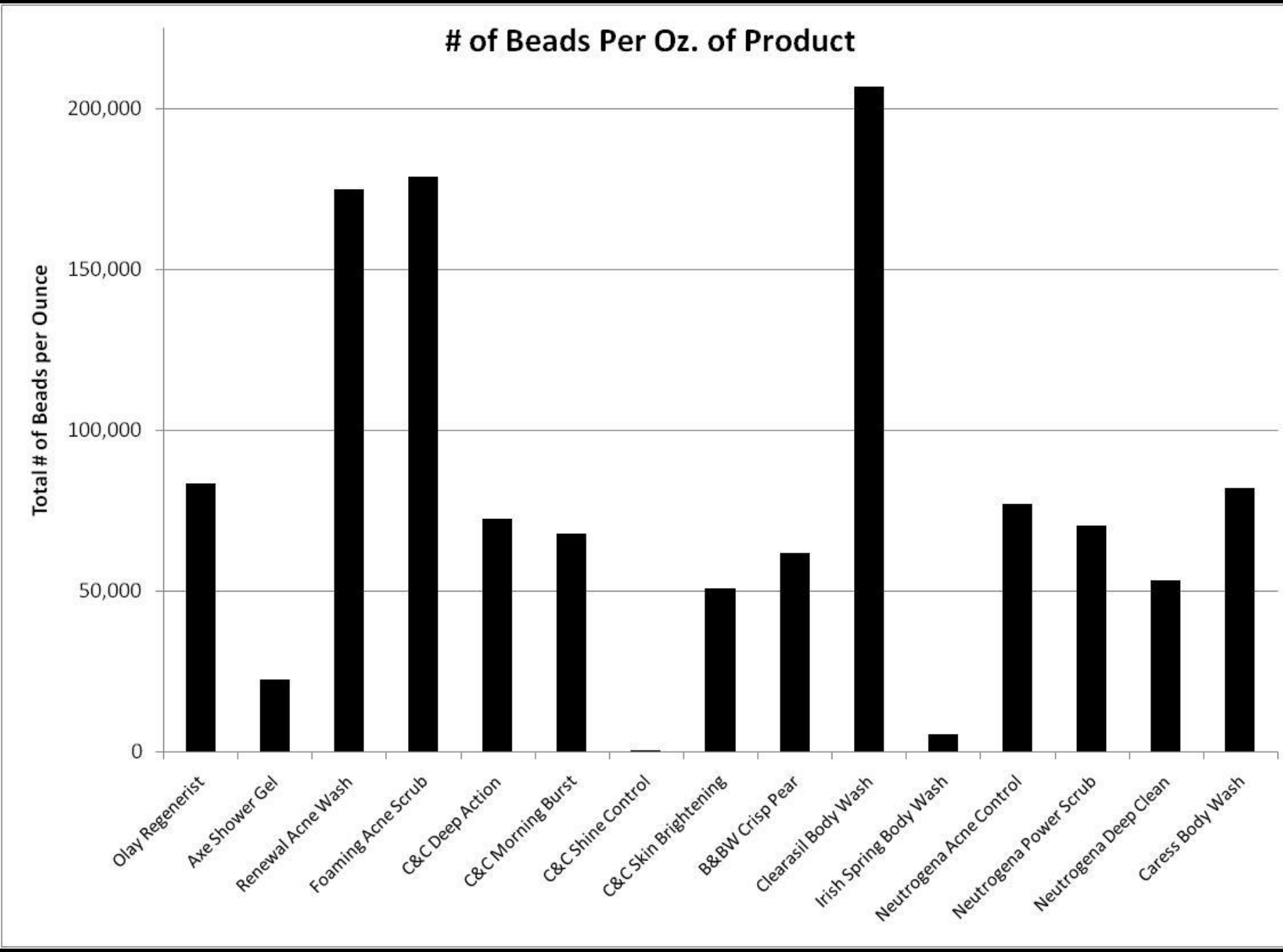
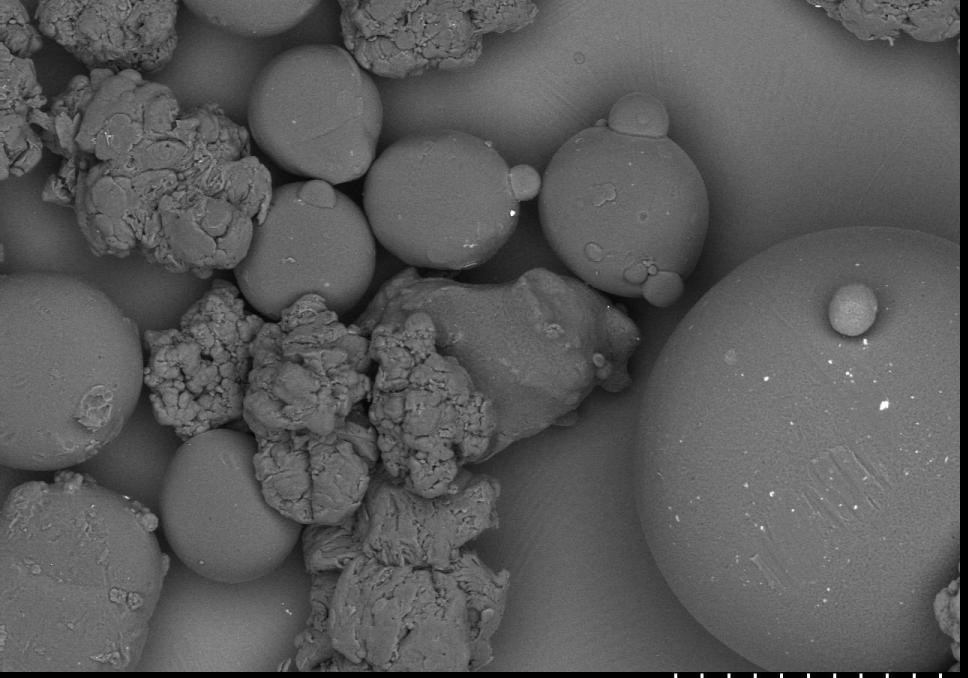
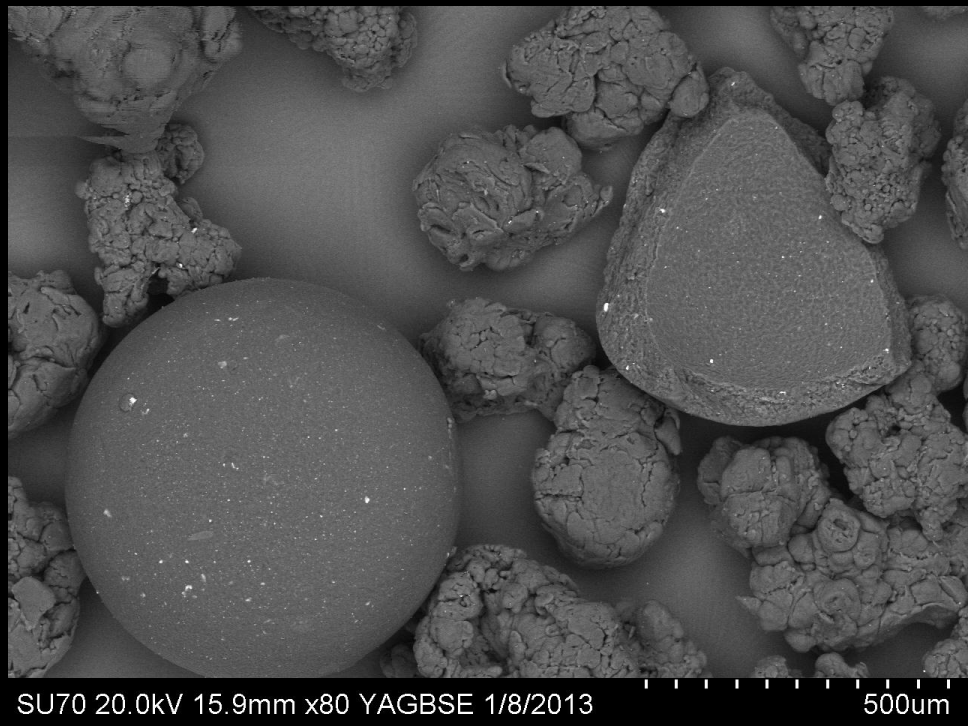
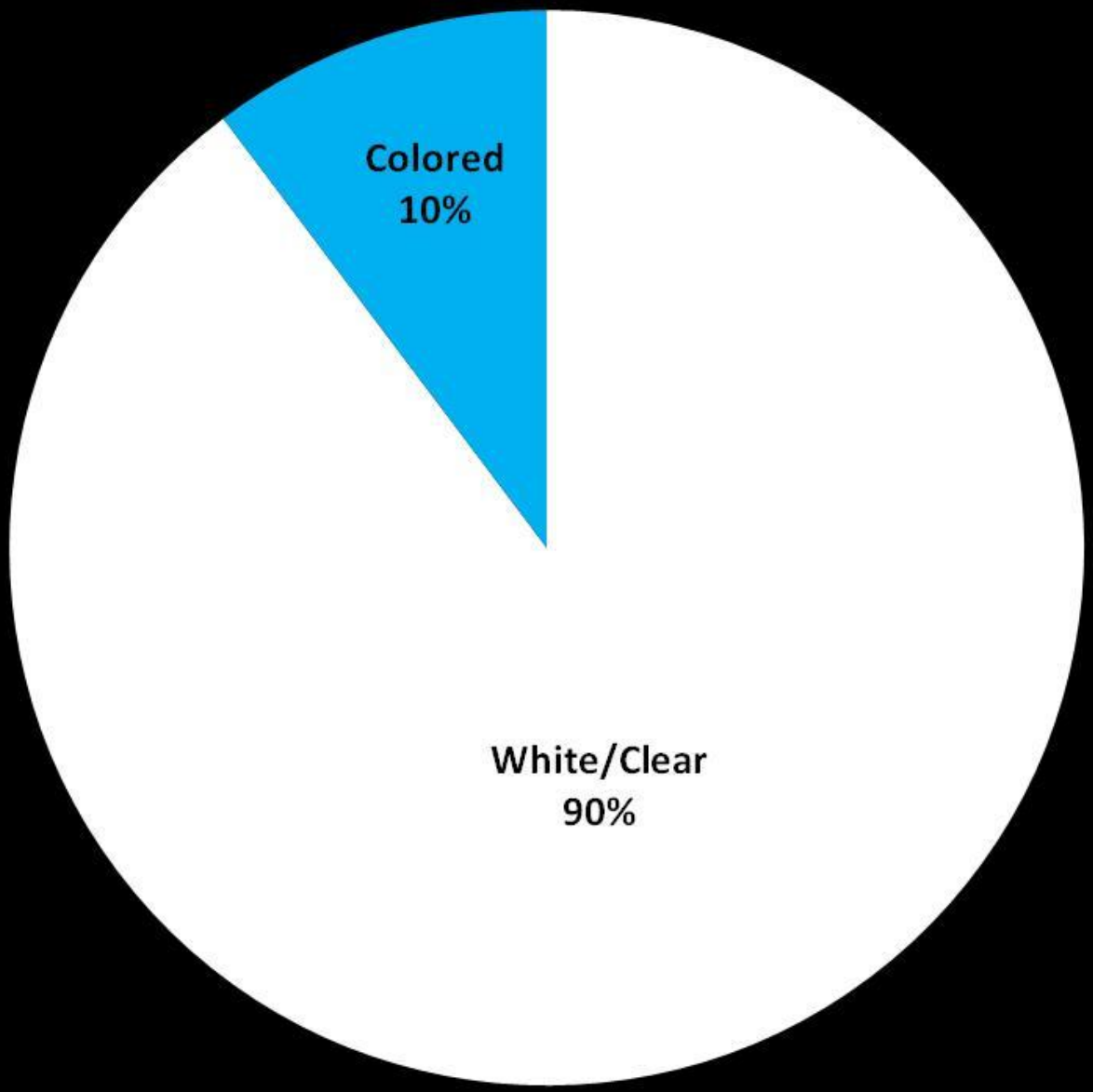
FREDONIA
STATE UNIVERSITY OF NEW YORK


Total # of Beads By Product
Total # of Beads
1,400,000
1,200,000
1,000,000
800,000
600,000
400,000
200,000
0
Olay Regenerist
Axe Shower Gel
Renewal Acne Wash
Foaming Acne Scrub
C&C Deep Action
C&C Morning Burst
C&C Shine Control
C&C Skin Brightening
B&BW Crisp Pear
Clearasil Body Wash
Irish Spring Body Wash
Neutrogena Acne Control
Neutrogena Power Scrub
Neutrogena Deep Clean
Caress Body Wash


# of Beads Per Oz. of Product
Total # of Beads per Ounce
200,000
150,000
100,000
50,000
0
Olay Regenerist
Axe Shower Gel
Renewal Acne Wash
Foaming Acne Scrub
C&C Deep Action
C&C Morning Burst
C&C Shine Control
C&C Skin Brightening
B&BW Crisp Pear
Clearasil Body Wash
Irish Spring Body Wash
Neutrogena Acne Control
Neutrogena Power Scrub
Neutrogena Deep Clean
Caress Body Wash


SU70 20.0kV 16.0mm x70 YAGBSE 1/8/2013
500um


SU70 20.0kV 15.9mm x80 YAGBSE 1/8/2013
500um

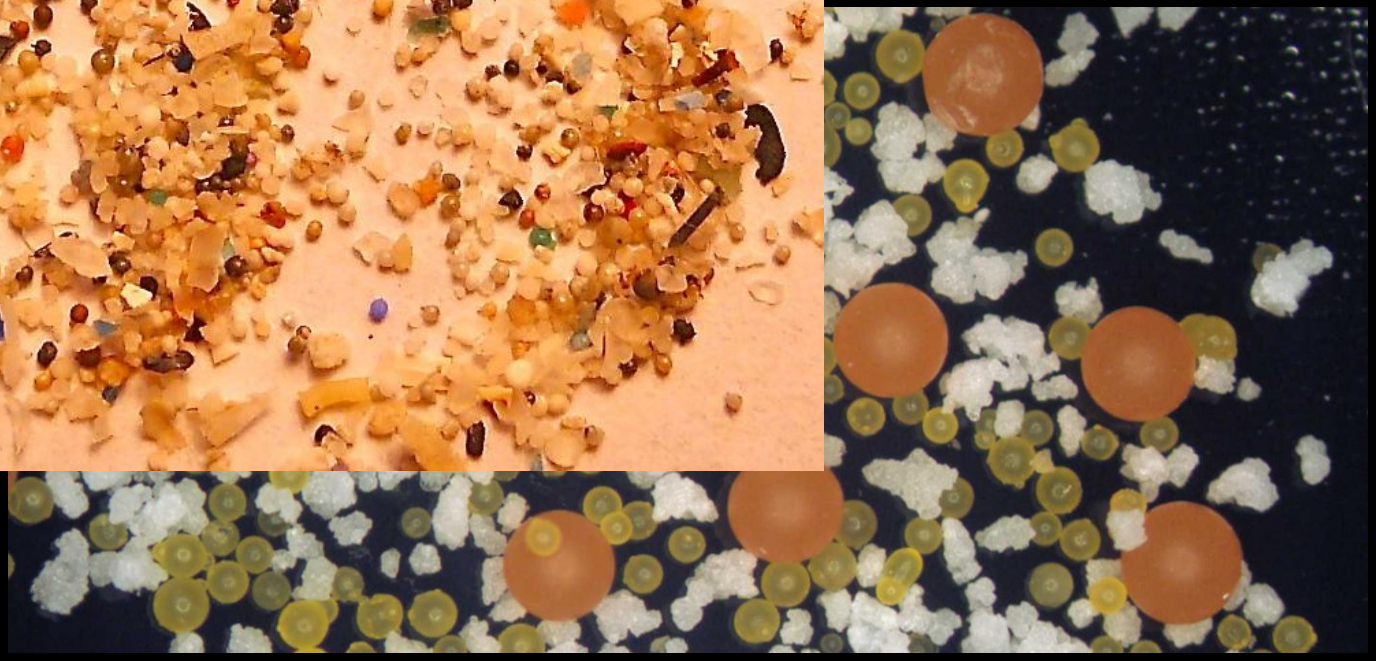

Colored
10%
White/Clear
90%

Sources

- Consumer Products
  - Photodegradation of Larger Plastic Items

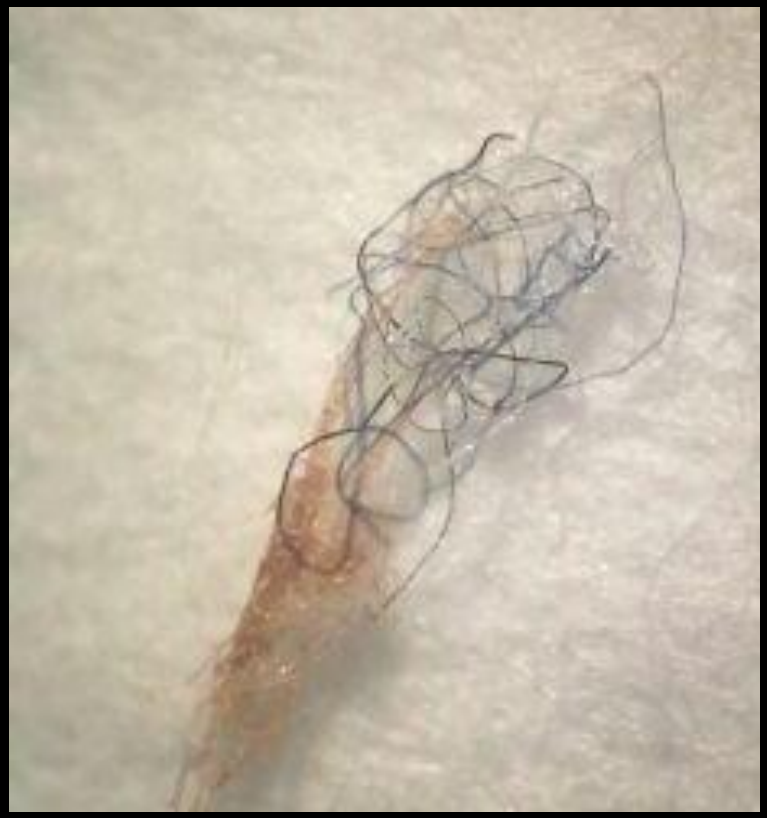
Sources

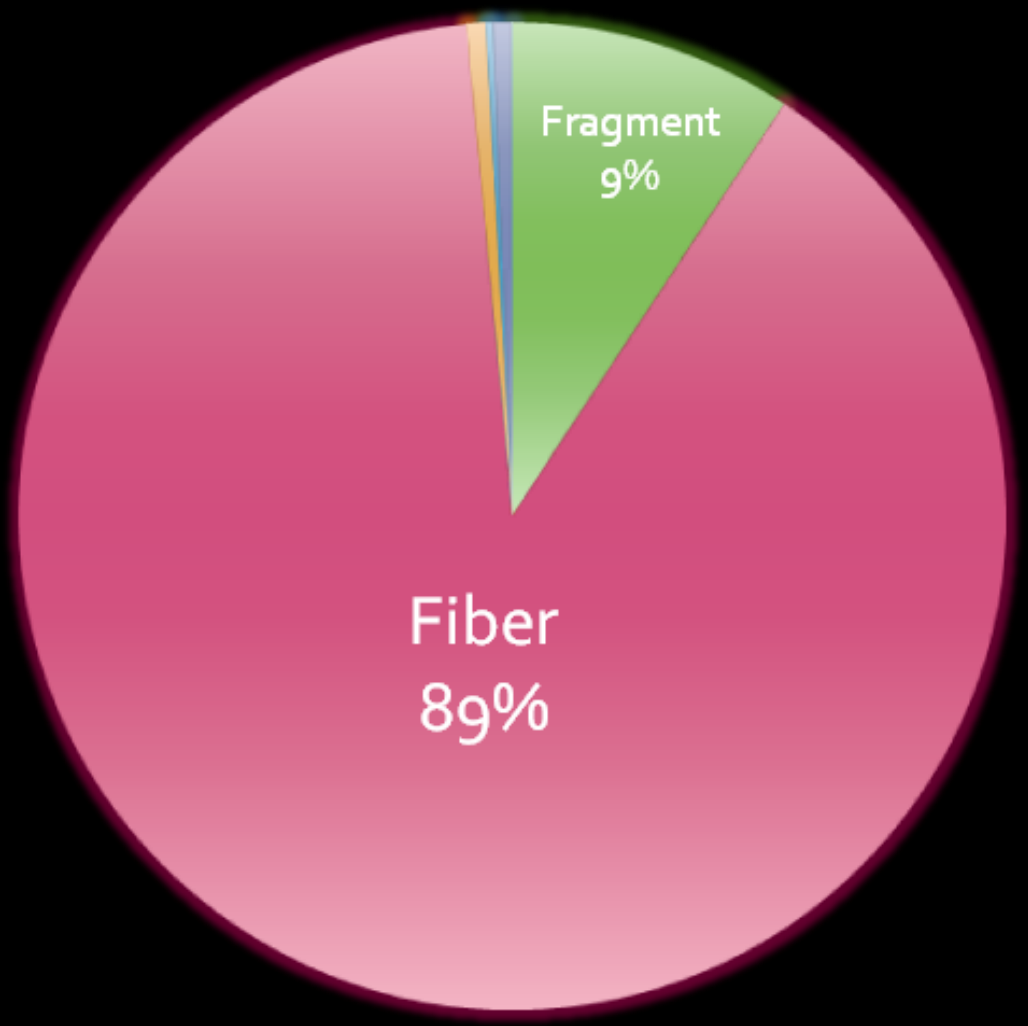
- Consumer Products
  - Photodegradation of Larger Plastic Items
  - Exfoliating Microbeads



Sources

- Consumer Products
  - Photodegradation of Larger Plastic Items
  - Exfoliating Microbeads
  - Synthetic Fabrics




Fragment
9%
Fiber
89%

Solutions

- Change what you buy
- Shake the Habit (of plastic bags)
- Ban the Bottle
- Bring your own utensils
- Don’t Take it To-Go (or at least not in plastic)
- Don’t Litter, Save the Critters
- Change the Laws
  - Extended Corporate Responsibility

Photos courtesy of Brendan Bannon

RIVERKEEPER.
NY's clean water advocate

The Committee on Consumer Affairs
Council of the City of New York

Thank you for offering Riverkeeper the opportunity to deliver testimony at the New York City Council Committee Hearing in support of Local Law No. 928, banning personal care products containing microbeads and a resolution calling on the State legislature to pass the Mircobead-free Waters Act.

Unfortunately, we will not be able to attend the hearing on Monday, but would like to submit the following statement in the record in support of both the local law and the resolution under consideration.

Riverkeeper fully supports the passage of Int. No. 928, "A Local Law to amend the administrative code of the city of New York, in relation to banning personal care products containing microbeads." We commend Councilman Garodnick for introducing this important legislation and encourage the Council to expeditiously pass this ban.

Nearly 19 tons of microbeads enter New York State's waters every year. This legislation sends an important message to the personal care products industry and the New York State legislature that local government will act when industry and the state fail to protect the environment.

Attached is Riverkeeper's memorandum of support for the Microbead-Free Waters Act (A.5896-Schimel & S.3932- O'Mara) which sets forth the basis for our support of legislation that bans the sale and offering for sale of personal care products which contain this insidious and increasingly ubiquitous form of plastic waste, microbeads.

The state microbeads bill received almost unanimous bi-partisan support in the NYS Assembly, passing by a margin of 139-1. A clear majority of State Senators also supported the legislation, but Senate leadership refused to bring the Senate bill to the floor for a vote.

We thank the City Council for your leadership in this matter, and we hope that the New York State Legislature will follow your lead when it reconvenes in January 2016 and pass statewide legislation that will prevent this significant source of plastic waste from continuing to enter our precious New York waterways.

Thank you for the opportunity to submit comments in support of these two important pieces of legislation being considered by the Council of the City of New York.

Kate Hudson
Director, Cross Watershed Initiatives
Riverkeeper

RIVERKEEPER.
NY's clean water advocate

MEMORANDUM OF SUPPORT
Microbead-Free Waters Act

A.5896 – Schimel **S.3932 – O'Mara**

Riverkeeper supports the Microbead-Free Waters Act , which would amend the environmental conservation law, in relation to prohibiting the manufacture, distribution and sale of personal cosmetic products containing microbeads.

Microbeads are minute plastic beads used in more than 100 personal care products, such as facial scrubs, shampoos, soaps, and toothpastes. They are used to replace naturally occurring exfoliants and scrubbing agents such as sea salt, oatmeal or crushed apricot or walnut shells.

Due to their small size, five millimeters or less, microbeads can pass through wastewater treatment plants directly into receiving waters throughout New York State. Scientists studying the plastic pollution have discovered alarming levels of microbeads in the Great Lakes.

Once in the water, microbeads can attract and accumulate certain toxic chemicals. Contaminated microbeads can be mistaken as food by small fish and wildlife. Scientific studies have shown that fish and wildlife of all sizes consume plastic, and that the chemicals can be passed up the food chain to larger fish, wildlife, and ultimately humans. Unfortunately, once released into a waterbody, microbeads cannot feasibly be removed.

Safe, natural alternatives (e.g., apricot shells, cocoa beans) that can biodegrade in an aquatic environment are already on the market. While some major corporations have pledged to phase-out plastic microbeads, some have not provided a phase-out deadline, and many have made no commitment at all. A ban is necessary to ensure all personal care products are microbead-free, to protect the waters of New York State.

The law will take effect on January 1, 2016, exempts personal care products that require a prescription and allows for delayed implementation of those products regulate by the FDA (January 1, 2017).

As microbeads threaten the goal of fishable, swimmable, and drinkable waters, Riverkeeper fully supports the Microbead-Free Waters Act.

SUPPLEMENTAL STATEMENT OF THE

NATURAL RESOURCES DEFENSE COUNCIL

BEFORE THE

NEW YORK CITY COUNCIL, COMMITTEE ON CONSUMER AFFAIRS

RE: ACTION TO CURB POLLUTION FROM PLASTIC MICROBEADS

October 2015

Every day, many millions of tiny plastic beads from personal care products like these are flushed down the drain and into New York City's surrounding waterways where they threaten fish and wildlife and pollute our rivers, bays and ocean. NRDC supports Intro. 928, which is designed to end the use of such microbeads in personal care products and over-the-counter drugs. Its passage would make the New York City Council a leader in protecting our marine environment.

NATURAL RESOURCES DEFENSE COUNCIL

40 W 20TH STREET | NEW YORK, NY | 10011 | T 212.727.2700 | F 212.727.1773 | NRDC.ORG

The Natural Resources Defense Council, Inc. ("NRDC") is a national, non-profit legal and scientific organization that has been active -- regionally, across the nation, and internationally -- on a wide a range of public health, natural resources and quality of life issues since its founding in 1970. Over this time, NRDC staff have advocated for, among other things, clean waterways and sustainable waste disposal practices right here in New York City, where NRDC has more than 15,000 members.

We welcome the opportunity to submit these written comments, prepared by NRDC staff members Eric A. Goldstein, Alison Chase and Darby Hoover. These comments supplement the testimony Eric delivered at the committee hearing last week in support of Intro. 928. As previously noted, we appreciate the leadership of Chairman Espinal in scheduling the hearing in timely fashion, as well as the impressive work of Councilmember Garodnick in advancing this bill and securing more than two dozen co-sponsors in a matter of weeks.[1] Finally, we want to thank New York State Attorney General Schneiderman, who has played such an important role in sounding the alarm and advancing legislative proposals in Albany to protect all of New York waterways from the growing menace of microbead pollution.

A. Plastic Microbeads Are Dangerous and Intro. 928 Can Protect Our Environment

Microbeads, as you know, are tiny particles of plastic, which have been added -- most often as scrubbing agents or exfoliates -- to many personal care products in recent years. Virtually every time such a product is used by a consumer, thousands of these tiny plastic beads are washed down the drain and can easily pass through sewage treatment plants and into our marine environment. Microbeads linger in our waters and sediments, acting like sponges that attract toxins such as PCBs to their surfaces. These microbeads can be consumed by fish and birds that are unable to distinguish between the tiny beads and their natural food supply. From the Great Lakes to New York Harbor to the Long Island Sound, microbeads are being detected in the waters surrounding New York City.

Intro. 928 offers a simple and straightforward solution to this problem. It would prohibit the sale in New York City of all non-prescription personal care products that contain microbeads, as of January 1, 2017.

NRDC strongly supports the proposed legislation. And fortunately, there are numerous substitutes for these plastic beads in consumer products, many of which have been used for decades. They include sand, salts, sugar, oatmeal, apricot pit shavings and walnut shells, among others.

---

[1] NRDC recognizes and appreciates the leadership of the more than two dozen Councilmembers who are co-sponsoring this legislation: Daniel Garodnick, Feernando Cabrera, Carlos Menchaca, Corey Johnson, Ritchie Torres, Mark Levine, Rafael Espinal, Costa Constantinides, Helen Rosenthal, Margaret Chin, Peter Koo, Rose, Mark Treyger, Jimmy Van Bramer, Stephen Levin, Rory Lancman, Andrew Cohen, Inez Dickens, Ben Kallos, Donovan Richards, Daniel Dromm, Brad Lander, Ydanis Rodriguez, Karen Koslowitz and Eric Ulrich.

In the remainder of these comments, we respond to several of the key questions that surfaced at last week's hearing, during the questioning of witnesses by Committee members.

B. Marine Biodegradability Is a Myth for Which No Exemption Should Be Granted

One question that was the focus of considerable discussion was whether it made sense for Intro. 928 to add an exception that would allow for the use of so-called "biodegradable" microbeads, as some in the industry have sought in other jurisdictions. NRDC believes that the answer is "no." The biodegradable exception is a wolf in sheep's clothing.

First, biodegradability provides no assurances -- none -- regarding how microbeads would degrade in the marine environment. There is no current standard for biodegradability in the marine environment.[2] Simply because a substance might biodegrade in the presence of sunlight, high temperatures, or other ideal conditions, that has little relevance as to whether such biodegradability is feasible in dark, cold water. Under less than optimal conditions, it is unclear how long decomposition would take and, during the degradation period, microbeads would continue to pose a significant environmental threat. Moreover, even "biodegradable" plastics may contain the same chemical additives as traditional plastics and may attract toxins; they are not the "safe" alternatives implied by the industry.

As to whether the Council should provide in Intro.928 for the possibility that industry may, at some uncertain point in the future, successfully develop a process for manufacturing microbeads that are truly "marine biodegradable," we believe that theoretical development is too speculative to be incorporated into the legislation at this time. (Should the industry ultimately create a new generation of microbeads with such miracle characteristics, a future City Council could at some later date amend the statute to take such new developments into account.) For similar reasons, the Council should not add a provision to Intro. 928 that would allow for a biodegradability exception even if a group like ASTM were to adopt a standard for marine biodegradability at some point in the future. There is just not enough information today to assess such a hypothetical standard and the Council should not agree at this time to bind itself to embracing, sight unseen, a standard that may be adopted by an entity like ASTM at some unknown future date.

Accordingly, we urge you to follow in the footsteps of other jurisdictions that have adopted microbead prohibitions without any biodegradability loopholes.

---

[2] ASTM International. "Standard Specification for Non-Floating Biodegradable Plastics in the Marine Environment (Withdrawn 2014)." Accessed 2 November 2015. *Available at*: http://www.astm.org/DATABASE.CART/WITHDRAWN/D7081.htm.

C. Microbeads from Cosmetics Are Problematic and Shouldn't Be Exempted from the Ban

A second question that arose at the hearing was whether Intro. 928 should be amended to exempt cosmetics from the microbead prohibition, with the ban limited to a smaller category of wash-off products. Such a weakening of the statute is not supported by the facts and would not be supported by NRDC.

Although cosmetics technically may be designed for removal by makeup removers and cleansers, the simple fact is that many people remove these products by washing their face in the sink and thereby ensuring the microbeads in these products end up in exactly the same place as other categories of microbeads – in our rivers, lakes and oceans. In terms of their environmental impact, microbeads from cosmetics are no different from microbeads in scrubs and abrasives. Accordingly, the Committee should retain the current language in Intro. 928, so that the microbead prohibition applies to all non-prescription personal care products, whether they are cosmetics or not.

D. NRDC Supports the Proposed Resolutions as Additional Actions, Not as Substitutes

At the hearing, the Committee also considered two resolutions that call for action by New York State and the federal government to curb the threats posed by microbead pollution. NRDC supports these resolutions.

But we support them only as additions to -- not substitutes for -- Intro. 928. History demonstrates that one of the most effective ways to get the state and/or federal government to move a policy issue is for local governments to grab the initiative and enact legislation themselves to circumvent gridlock in Albany and Washington D.C. Thus, it is action by the City Council, in the form of passage of Intro.928 that will -- even more than adopting resolutions -- provide the incentive to our state and federal governments to act.

E. NRDC Supports a Modest Extension of the Effective Date

At the hearing, several witnesses including Consumer Affairs Commissioner Menin questioned whether the date on which the microbead prohibition is to take effect could be pushed back. As currently drafted, the sale of all personal care products containing microbeads would be prohibited as of January 1, 2016 (and the date on which microbeads in over-the-counter drugs would be prohibited is January 1, 2017). This first date may not provide enough lead time for stores to change their existing stocks of microbead-containing personal care products. Accordingly, NRDC would not object to a year's extension of the first date, so that the prohibition on sales of both personal care products and over-the-counter drugs containing microbeads would take effect on January 1, 2017.

F. NRDC Supports an Approach to Enforcement that is Sensible and Effective

A final question raised at the hearing by Commissioner Menin related to ensuring that the Department would be able to implement a successful enforcement policy. If we correctly understood her concerns, the Commissioner wanted to limit the number of potential summons issued at any one location at any one time to not more than ten. (Thus, an over-zealous enforcement agent could not issue 100 Notices of Violation to a single drug store that was carrying 100 individual tubes of facial scrub and other products containing microbeads.) NRDC supports such reasonable enforcement measures and believes that such details can be proposed and promulgated under Department of Consumer Affairs' rules, as provided for in section 20-699.10 of the statute. If the Committee concludes that additional language to accomplish this purpose needs to be added to Intro. 928 itself, NRDC would not object to such an amendment.

* * * *

In sum, Intro. 928 is in all likelihood the most significant piece of environmental legislation the City Council will be taking action on this year. NRDC applauds the leadership of Councilmember Garodnick, Chairman Espinal and the growing group of co-sponsors. We urge that you pass Intro. 928 this year and stand ready to support your efforts in any way we can.

BUSINESS DAY

California Becomes Latest State to Ban Plastic Microbeads

By RACHEL ABRAMS OCT. 8, 2015

Gov. Jerry Brown of California signed legislation on Thursday that bans plastic microbeads, giving his state one of the country's strongest laws against the tiny abrasives used in exfoliators and other products.

"We're obviously incredibly excited," said Stiv Wilson, director of campaigns at the nonprofit group the Story of Stuff Project. "We just passed a very simple ban on plastic microbeads without any loopholes."

The consumer products industry had objected to certain aspects of the bill, arguing that it was overly restrictive and did not allow companies to come up with environmentally friendly alternatives. The California rules include a prohibition against biodegradable microbeads, which other states with similar legislation allow.

At least six other states have passed laws restricting microbeads, including Colorado, Illinois, Indiana, Maine, Maryland and New Jersey.

Lisa Powers, a spokeswoman for the Personal Care Products Council, said in an email that the industry trade group had taken a neutral position on the bill.

Microbeads look like tiny dots suspended in cleansers and other toiletries. Manufacturers including Johnson & Johnson and Procter & Gamble advertise their exfoliating power, particularly in face and body scrubs.

But when consumers rinse these products off, the microbeads flow from sinks and showers into the water. Billions of microbeads have the same effect as grinding up plastic water bottles and dumping them into the ocean, environmentalists say.

THE COUNCIL
THE CITY OF NEW YORK

Appearance Card

I intend to appear and speak on Int. No. _____ Res. No. _____

☐ in favor ☐ in opposition

Date: 10/26/15

(PLEASE PRINT)

Name: Sarah Krame

Address: _____

I represent: NYU Environmental Law Clinic

Address: _____

THE COUNCIL
THE CITY OF NEW YORK

Appearance Card

I intend to appear and ~~speak~~ on Int. No. 928 Res. No. _____

☑ in favor ☐ in opposition

Date: 10/26/15

(PLEASE PRINT)

Name: Peter Washburn WTC

Address: 120 Broadway

I represent: NYS Attorney General

Address: 120 Broadway, NY

THE COUNCIL
THE CITY OF NEW YORK

Appearance Card

I intend to appear and speak on Int. No. 928 Res. No. _____

☒ in favor ☐ in opposition

Date: 10-26

(PLEASE PRINT)

Name: Nicole Robinson-Etienne

Address: _____

I represent: NY Aquarium

Address: _____

Please complete this card and return to the Sergeant-at-Arms

THE COUNCIL
THE CITY OF NEW YORK

Appearance Card

I intend to appear and speak on Int. No. _____ Res. No. _____

☒ in favor ☐ in opposition

Date: _____

(PLEASE PRINT)

Name: Susan Elbin

Address: 71 W 23rd St. NY, NY

I represent: NYC Audubon

Address: _____

THE COUNCIL
THE CITY OF NEW YORK

Appearance Card

I intend to appear and speak on Int. No. 928 Res. No. _____

☑ in favor ☐ in opposition

Date: 10/26/15

(PLEASE PRINT)

Name: JOHN COGHLAN

Address: 10 PLAZA ST E., BROOKLYN, 11238

I represent: SURFRIDER FOUNDATION, NYC

Address: _____

THE COUNCIL
THE CITY OF NEW YORK

Appearance Card

I intend to appear and speak on Int. No. 928 Res. No. _____

☑ in favor ☐ in opposition

Date: 10/26/15

(PLEASE PRINT)

Name: Jordan Christensen

Address: 400 S 2nd St Brooklyn NY

I represent: Citizens Campaign for the Environment

Address: 225 Main St Farmingdale NY

Please complete this card and return to the Sergeant-at-Arms

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THE CITY OF NEW YORK

Appearance Card

I intend to appear and speak on Int. No. 928 Res. No. _____

☑ in favor ☐ in opposition

Date: 10/26/15

(PLEASE PRINT)

Name: Sandra Meola

Address: 94 Mawhinney Ave Hawthorne NJ 07506

I represent: NY/NJ Baykeeper

Address: 52 W Front St. Keyport NJ 07735

THE COUNCIL
THE CITY OF NEW YORK

Appearance Card

I intend to appear and speak on Int. No. _____ Res. No. _____

☐ in favor ☐ in opposition

Date: _____

(PLEASE PRINT)

Name: Eric Landau

Address: ~~NYC DEP~~ Patrick Hoffman

I represent: Associate Commissioner

Address: _____

THE COUNCIL
THE CITY OF NEW YORK

Appearance Card

I intend to appear and speak on Int. No. 928 Res. No. _____

Questions with DEP ☑ in favor ☐ in opposition

Date: 10/26/15

(PLEASE PRINT)

Name: David Lyons/Cy

Address: 59-17 Junction Blvd

I represent: NYCDEP

Address: _____

Please complete this card and return to the Sergeant-at-Arms

THE COUNCIL
THE CITY OF NEW YORK

Appearance Card

I intend to appear and speak on Int. No. _____ Res. No. _____

☐ in favor ☐ in opposition

Date: _____

(PLEASE PRINT)

Name: Commissioner Julie Menin

Address: _____

I represent: DCA

Address: _____

THE COUNCIL
THE CITY OF NEW YORK

Appearance Card

I intend to appear and speak on Int. No. _____ Res. No. _____

☐ in favor ☐ in opposition

Date: _____

(PLEASE PRINT)

Name: Alba Pico

Address: _____

I represent: DCA

Address: _____

THE COUNCIL
THE CITY OF NEW YORK

Appearance Card

I intend to appear and speak on Int. No. _____ Res. No. _____

☐ in favor ☐ in opposition

Date: _____

(PLEASE PRINT)

Name: Amit Bagga

Address: _____

I represent: DCA

Address: _____

Please complete this card and return to the Sergeant-at-Arms

THE COUNCIL
THE CITY OF NEW YORK

Appearance Card

I intend to appear and speak on Int. No. _____ Res. No. _____

☐ in favor ☐ in opposition

Date: _____

(PLEASE PRINT)

Name: Mary Cooley

Address: _____

I represent: DCA

Address: _____

THE COUNCIL
THE CITY OF NEW YORK

Appearance Card

I intend to appear and speak on Int. No. _____ Res. No. _____

☐ in favor ☐ in opposition

Date: _____

(PLEASE PRINT)

Name: Tamala Boyd

Address: _____

I represent: DCA

Address: _____

THE COUNCIL
THE CITY OF NEW YORK

Appearance Card

I intend to appear and speak on Int. No. _____ Res. No. _____

☐ in favor ☐ in opposition

Date: _____

(PLEASE PRINT) DCA

Name: Julie Menin - Commissioner

Address: _____

I represent: Dept. Consumer Affairs

Address: 42 Bdway - NYC 10004

Please complete this card and return to the Sergeant-at-Arms

THE COUNCIL
THE CITY OF NEW YORK

Appearance Card

I intend to appear and speak on Int. No. _____ Res. No. _____

☐ in favor ☐ in opposition

Date: _____

(PLEASE PRINT)

Name: Alba Pico

Address: _____

I represent: Dept. Consumer Affairs

Address: 42 Bdway - NYC 10004

THE COUNCIL
THE CITY OF NEW YORK

Appearance Card

I intend to appear and speak on Int. No. _____ Res. No. _____

☐ in favor ☑ in opposition

Date: _____

(PLEASE PRINT)

Name: Amit Bagga, Deputy Commissioner

Address: _____

I represent: DCA

Address: _____

THE COUNCIL
THE CITY OF NEW YORK

Appearance Card

I intend to appear and speak on Int. No. _____ Res. No. _____

☐ in favor ☐ in opposition

Date: _____

(PLEASE PRINT)

Name: Amit Bagga

Address: _____

I represent: Dept. Consumer Affairs

Address: 42 Broadway, NYC 10004

Please complete this card and return to the Sergeant-at-Arms

THE COUNCIL
THE CITY OF NEW YORK

Appearance Card

I intend to appear and speak on Int. No. _____ Res. No. _____

☐ in favor ☐ in opposition

Date: _____

(PLEASE PRINT)

Name: Tamala Boyd

Address: _____

I represent: Dept. Consumer Affairs

Address: 42 Broadway, NYC 10004

THE COUNCIL
THE CITY OF NEW YORK

Appearance Card

I intend to appear and speak on Int. No. 928 Res. No. _____

☐ in favor ☑ in opposition

Date: Oct. 26, 2015

(PLEASE PRINT)

Name: STEPHEN ROSARIO

Address: 11 N PEARL ST. ALBANY, NY

I represent: AMERICAN CHEMISTRY COUNCIL

Address: _____

THE COUNCIL
THE CITY OF NEW YORK

Appearance Card

I intend to appear and speak on Int. No. 928 Res. No. _____

☐ in favor ☐ in opposition

Date: 10/26/2015

(PLEASE PRINT)

Name: Mike Thompson

Address: _____

I represent: Personal Care Products Council

Address: _____

Please complete this card and return to the Sergeant-at-Arms

THE COUNCIL
THE CITY OF NEW YORK

Appearance Card

I intend to appear and speak on Int. No. _____ Res. No. _____

☐ in favor ☐ in opposition

Date: _____

(PLEASE PRINT)

Name: Sherri Mason

Address: 33 Middlesex Dr.

I represent: SBNY Fredonia

Address: _____

THE COUNCIL
THE CITY OF NEW YORK

Appearance Card

I intend to appear and speak on Int. No. 928 Res. No. _____

☐ in favor ☒ in opposition

Date: 10/26/15

(PLEASE PRINT)

Name: Sean Moore

Address: 1625 Eye St NW Ste 600 Washington DC

I represent: Consumer Healthcare Products Association

Address: (Same as above)

THE COUNCIL
THE CITY OF NEW YORK

Appearance Card

I intend to appear and speak on Int. No. 928 Res. No. _____

☐ in favor ☐ in opposition

Date: 10-26-15

(PLEASE PRINT)

Name: Saima Aram

Address: 353 Hamilton Street, Albany, NY 12202

I represent: Environmental Advocates of NY

Address: _____

Please complete this card and return to the Sergeant-at-Arms

THE COUNCIL
THE CITY OF NEW YORK

Appearance Card

I intend to appear and speak on Int. No. 928 Res. No. _____

☑ in favor ☐ in opposition

Date: _____

(PLEASE PRINT)

Name: ERIC A. GOLDSTEIN

Address: 4

I represent: NATURAL RESOURCES DEFENSE COUNCIL

Address: 40 WEST 20 ST NY NY

Please complete this card and return to the Sergeant-at-Arms

THE COUNCIL
THE CITY OF NEW YORK

Appearance Card

I intend to appear and speak on Int. No. 0928 Res. No. _____

☑ in favor ☐ in opposition

Date: 10/26/15

(PLEASE PRINT)

Name: Ya-Ting Liu

Address: _____

I represent: New York League of Conservation Voters

Address: 30 Broad St 34th 10004

Please complete this card and return to the Sergeant-at-Arms