



TALKING TRASH

Canada's Plastic Pollution Problem

Plastic pollution is piling up around us. Canada only recycles 11 per cent of its plastic waste, letting the rest accumulate in landfills or the environment, and without a strong national strategy to deal with the problem, it isn't going to stop. We can't keep making new products, using them once and throwing them away (or burning them). We need to move away from this linear consumption model, and towards a circular economy.

The good news is, governments, industry, and the public agree that plastic doesn't belong in our environment. This is our chance to redefine the future of plastic waste.

CANADA NEEDS A NATIONAL
WASTE STRATEGY TO ACHIEVE
ZERO PLASTIC
WASTE BY 2025



Plastic pollution – a global issue

Nowhere on the planet is untouched by plastic pollution. Plastics are found in remote arctic regions¹, deep ocean trenches², tap water³, bottled water⁴, seafood⁵, sea salt, and even beer.⁶ An estimated 8 million tonnes of plastic are dumped into the world's oceans every year⁷ – the equivalent of one garbage truck's worth every minute. And if trends aren't reversed, the World Economic Forum estimates that by 2050 there will be more plastic than fish in the world's oceans.⁸

Plastics weren't widely available until the 1950s, but since then their use has skyrocketed. Global production of plastic has increased from 2 million tonnes in 1950 to 380 million tonnes in 2015, adding more than 8.3 billion tonnes of cumulative production.⁹ And of that plastic, about 60 per cent has been discarded and is accumulating in landfills and the environment. That's enough to bury Manhattan under 5km of plastic trash. Nine per cent has been incinerated, 24 per cent is still in use, and only 7 per cent has been recycled.

Clearly, we have a global plastic pollution problem.

Plastics harm animals and ecosystems

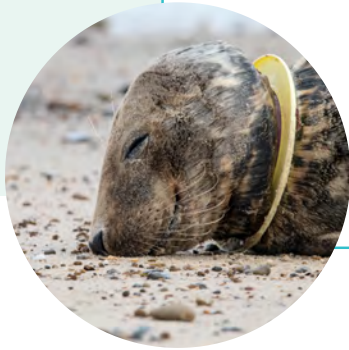
One of the celebrated features of plastic, its durability, is also one of the reasons it's so problematic when it enters the environment. Unlike natural materials, plastics never fully decompose. Instead, they break into small pieces called microplastics, which can easily be consumed by fish, and other animals – including people.

Studies have found that 90 per cent of seabirds have plastic in their guts. One in three sea turtles and more than half of all whale and dolphin species have eaten plastic.¹⁰ When fish and animals eat plastic it can fill their stomachs, leaving no room for food and causing them to starve with full bellies. Research also suggests that some plastics may release toxins causing liver toxicity and hormone disruption.¹¹

**60 PER CENT OF ALL THE PLASTIC EVER MADE IS
PILED UP IN LANDFILLS AND THE ENVIRONMENT.
THAT'S ENOUGH TO BURY MANHATTAN 5KM DEEP**

THE SIMPLE TRUTH IS THAT PLASTIC POLLUTION KILLS WILDLIFE

- 100,000 marine creatures die every year
- About 1 million seabirds also die from plastic¹²
- Marine litter is hurting more than 800 species worldwide¹³



The human health impacts

The long-term impacts of plastic pollution on human health are still unclear. To date, most research has focused on marine life. **However, some common plastic ingredients are well known to be harmful to human health, including vinyl chloride¹⁴ and styrene.¹⁵**

Vinyl chloride is the building block for polyvinyl chloride (PVC). PVC is one of the most widely used plastics worldwide. It has a range of uses including things like indoor pipes and window frames, as well as raincoats and shower curtains. And it is commonly found in microplastics recovered from marine environments.¹⁶ Vinyl chloride is listed by the International Agency for Research on Cancer (IARC) as “carcinogenic to humans (Group 1)”.¹⁷ That’s the same grade given to tobacco smoke, formaldehyde, and asbestos.

Styrene is the building block for polystyrene – a plastic commonly used to make disposable cutlery and Styrofoam packaging. The IARC lists styrene as a “probable carcinogen to humans (Group 2A)”.¹⁸ This is the same grade given to human papillomavirus (HPV) which has been linked to cervical cancer, and nitrates (commonly found in processed meats).



Canada's plastic pollution problem

Currently, only about 11 per cent of the plastic used in Canada is recycled.¹⁹ That means nearly 90 per cent ends up in landfills, incinerators, or the environment, including the oceans and Great Lakes. In fact, an estimated 10,000 metric tonnes of plastic end up in the Great Lakes every year.²⁰

Canada doesn't have a national framework for managing plastics. There is no national recycling target. There are no laws that require recycled materials be used in the manufacturing of new plastic goods, or incentives for producers that use recycled content. There are no national bans on hard-to-recycle or toxic plastics (like PVC and styrene).

Provinces each set their own waste legislation, and in every province except British Columbia²¹, it's left to municipalities to collect and manage residential waste. This disjointed and fragmented approach means different provinces have different standards and definitions for concepts like waste diversion. It also means that what can and can't be recycled changes depending on where you are.

To make matters worse, this system is costing municipalities and taxpayers millions of dollars.²² In all provinces except British Columbia,

municipalities pay to collect and process plastic packaging, but they aren't the ones manufacturing, importing or selling the products. When a new baby food pouch or coffee pod is put on the market, municipalities are the ones that need to figure out how to best capture and process it. New sorting or processing technologies cost money, and not all municipalities will be able to justify these expensive investments. As a result, different materials are recyclable in different municipalities, leaving a patchwork that is confusing for citizens.

Globally, the economic costs of managing plastics are high. Approximately 95 per cent of the material value of plastic packaging is lost to the economy after a single use. The plastic is made, used, and then thrown away. That works out to between \$100 and \$150 billion dollars each year.²³ What a waste.

10,000 METRIC TONNES OF PLASTIC
END UP IN THE GREAT LAKES EVERY YEAR²⁰

The world takes action

The good news? In Canada and around the world, people are increasingly concerned about plastic pollution and want to see action.

Other countries are moving to ban specific plastic products and phase out single-use plastics altogether. The UK has announced plans to ban the use of plastic straws, plastic stemmed cotton swabs and plastic coffee stirrers.²⁴ Kenya has rolled out what is considered to be the world's toughest plastic bag ban, which includes potential jail time and huge fines for Kenyans producing, selling or using plastic bags.²⁵

Meanwhile, the European Commission has proposed new rules to target the 10 single-use plastic products most often found on Europe's beaches and seas, as well as lost and abandoned fishing gear.²⁶ The new rules include: banning certain plastic products where alternatives are readily available and affordable; consumption reduction targets; and making producers financially responsible for some of the costs of waste management and clean-up.

Not to be left behind, in June 2018 Canada spearheaded the G7 Ocean Plastics Charter.²⁷ But Canada still lacks a national plastics strategy and framework for domestic action.

Canada's plastic free future

Now is the time for a national plastic waste reduction strategy – one that gets Canada to zero plastic waste by 2025. The goal must be to shift Canada away from a linear “make-use-dispose” consumption model, and into a circular economy. At a minimum, it should include:

1

Bans on plastics and additives that are harmful, or challenging to recycle, reuse, remanufacture or compost

2

A national recycling target to ensure **100 per cent of single-use plastics are captured** and at least 85 per cent are recycled by 2025

3

A national 75 per cent recycled content standard for single-use plastics to encourage the use of recycled plastics in new products

4

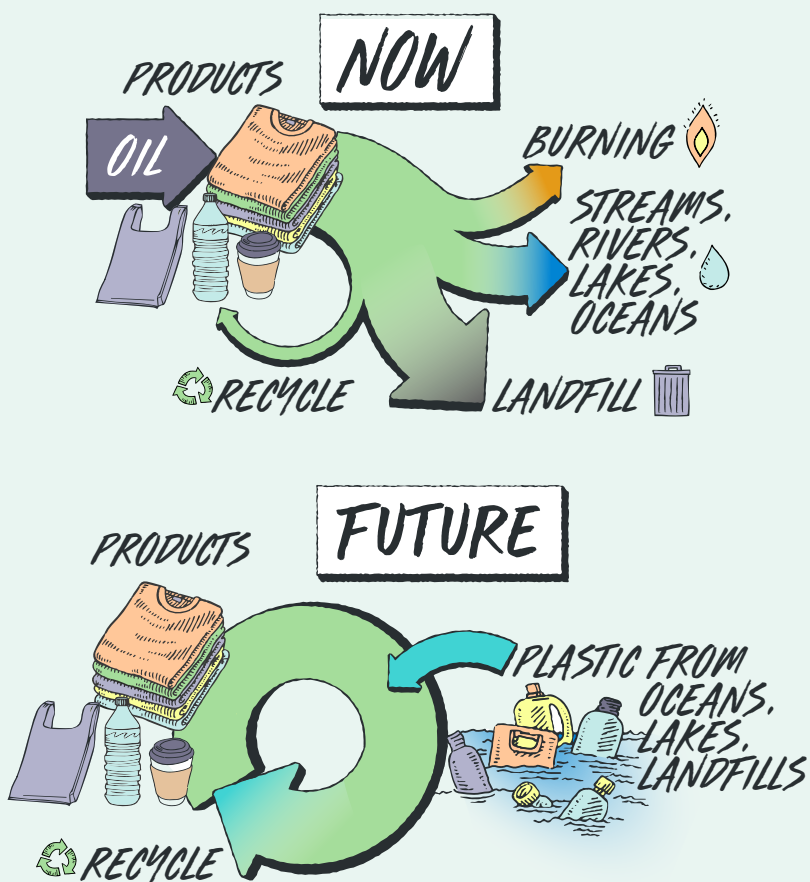
Enforceable legislation that makes producers financially and operationally responsible for collecting and recycling their products (full Extended Producer Responsibility)

In June of 2018, more than 40 environmental and civil society groups signed on to the Towards a Zero Plastic Waste declaration, which includes these and 14 other actions Canada should include in its national plastic strategy. To view the Declaration in full visit environmentaldefence.ca/plasticsdeclaration

What is a Circular Economy?

In nature nothing is wasted. Bacteria and fungi consume dead trees, and in the process they excrete nutrients which enrich the soil and feed future trees. When animals die they are eaten by other animals, bacteria and insects, which are, in turn, then food for other animals.

The circular economy²⁸ takes this natural principle and applies it to the way we design and produce products. In a circular system, plastics would be collected at their end of life and turned into new plastic goods. Instead of trying to dispose of “waste”, we’d see it as an essential source of valuable resources — something to be harvested and used as materials for new products.



REDEFINING WASTE

Canada needs policies that encourage a circular economy - like mandatory recycled content targets, landfill bans, incinerator and landfill taxes, and funding for new technologies that make it easier to make new plastics from old plastic.

Incineration is not recycling

Burning plastic to make it “disappear” is not the answer to our problem. Incinerating our used plastic does not fit with a circular economy, and in fact it actually creates an incentive to continue producing more waste.

Supporters of plastic incineration point out that energy can be captured through the burning process (energy from waste), and that incineration should be preferable to landfill. But incineration can lead to unintended outcomes and deter policy makers from actually grappling with the problem of plastic pollution.

The priorities need to be waste prevention, reuse, composting, and recycling. Incineration actually promotes waste generation by creating demand for more waste to feed power generators. That means extracting ever more virgin oil to create brand new plastic products, to then send to the incinerators. To avoid incineration becoming the default way

plastic materials are managed at the end of their life, Canada needs to be clear that it is not a form of waste diversion, or recycling; it's a form of disposal, just like landfilling.

In 2016, Ontario released its Strategy for a Waste-Free Ontario²⁹ where it stated that although energy from waste and alternative fuels are permitted as waste management options, these methods do not count towards diversion or recycling targets. Canada should take a similar approach to avoid having incineration become the primary way of managing plastic materials at their end-of-life. Incineration promotes a linear economy.



INCINERATION ACTUALLY PROMOTES WASTE GENERATION

The case to ban Styrofoam

Sometimes it does make sense to ban certain plastics. Expanded polystyrene (EPS), commonly referred to as Styrofoam, is a perfect example. Despite regulations across Canada encouraging the collection and recycling of EPS, 80 per cent³⁰ of it ended up in Canada's landfills and environment in 2012. That works out to the equivalent of 208 Olympic sized swimming pools of styro-waste every year.

Part of the problem is that Styrofoam is only practically recyclable if it is clean, un-dyed and uncontaminated, and when you consider that it often holds food, it rarely meets those conditions.

Another problem with EPS is that it is commonly contaminated with flame-retardant chemicals such as hexabromocyclododecane (HBCD) or perfluorooctanoic acid (PFOA). These chemicals can leach into the environment and potentially impact human health.^{31, 32}

Due to contamination, and the fact that it is made from the “probable carcinogen” styrene,³³ it's easy to see why even if we could recycle all the styrofoam effectively we might be better off not using it.



Producers should be held responsible

Right now, making new plastic from fossil resources is cheap, the cost of collecting and recycling plastic is high, and dumping plastic into the environment is essentially free. Therefore, there's little incentive for businesses to change their packaging, or invest in innovative recycling systems and infrastructure.

In every province except British Columbia, there's a disconnect between the companies selling plastic products and packaging and the systems that collect and manage plastics at their end-of-life. If a company develops a new multi-layer plastic pouch for frozen fruit or baby food, they aren't legally or financially responsible for collecting and recycling it.

Municipalities are the ones who have to figure out how to best collect and recycle the material. And sometimes it isn't technically or economically feasible. Producers make these products, they make money doing so, but then at their end-of-life, municipalities and taxpayers are left holding the bag — and footing the bill.

Things are not going to change unless government takes decisive action. There is a better way. Federal or provincial governments could make producers responsible for collecting and recycling the materials they put on the market. It's called Extended Producer Responsibility, or EPR legislation. Governments can set and enforce high collection and diversion targets. Then businesses would be incentivized to either create packaging that is more easily recyclable, or to develop new recycling technologies, improve collection programs or find other ways to achieve their goals.

There's growing consensus that EPR should be a core pillar of Canada's national plastics strategy. Municipalities want to see producers take responsibility³⁴, and even businesses want to see governments legislate and enforce EPR.³⁵ While some producers have already pledged to take action without legislation, voluntary actions alone just aren't going to cut it. We need the Federal Government to provide a strong legal framework for the whole of Canada. For businesses, a national law brings clarity and structure. For consumers, it brings peace of mind that the products they buy can and will be recycled.

Beer and the EPR model

EPR is not just a pipe dream. In Ontario, the Beer Store operates an EPR model financed by their beverage suppliers, where you pay a small deposit on your bottle or can, and have it refunded to you on returning it to the store. The bottles are then sorted and sent back to their producer for re-use. And it works. 95 per cent of bottles are captured and returned.



Conclusion

Plastic pollution is a global issue.³⁶ Plastics are found in remote arctic regions³⁷, deep ocean trenches³⁸, the water we drink^{39,40}, and the foods we eat.⁴¹ We've all seen photographs of animals tangled in plastic debris, but the impacts on wildlife don't end there. When fish and animals eat plastic, they can starve⁴², and there is also research suggesting that the plastics release toxins, causing liver toxicity and hormone disruption.⁴³ Clearly something's got to change. We can't keep producing plastics and dumping them into the environment when we're done with them.

Despite growing public concern about plastic pollution, Canada doesn't have a national framework for managing plastics. And it shows. Currently, only about 11 per cent of the plastic used in Canada is

recycled.⁴⁴ The remaining 90 per cent ends up in landfills, incinerators, or the environment, including our oceans, and the Great Lakes.

The good news is that Canada announced plans to use its G7 presidency to champion global action on plastic pollution, and in June, signed-on to the G7 Ocean Plastics Charter . Canada has also signalled its intention to work with provinces and territories to build the national framework we desperately need.

Now is the time for a national plastic waste reduction strategy – one that gets Canada to zero plastic waste by 2025, and that moves us toward a circular economy.

Recommendations

The Federal Government should implement a national plastic waste reduction strategy to achieve zero plastic waste by 2025. It should include:

1

Bans on plastics and additives that are harmful, or challenging to recycle, reuse, remanufacture or compost

2

A national recycling target to ensure **100 per cent of single-use plastics are captured** and at least 85 per cent are recycled by 2025

3

A national 75 per cent recycled content standard for single-use plastics to encourage the use of recycled plastics in new products

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Enforceable legislation that makes producers financially and operationally responsible for collecting and recycling their products (full Extended Producer Responsibility)

References

- ¹ Group of Experts on the Scientific Aspects of Marine Environmental Protection (GESAMP). Sources, fates and effects of microplastics in the marine environment – a global assessment. (2015). Retrieved from http://ec.europa.eu/environment/marine/good-environmental-status/descriptor-10/pdf/GESAMP_microplastics%20full%20study.pdf
- ² Kosuth, M., Mason, S.A., Wattenberg, E.V. Anthropogenic contamination of tap water, beer, and sea salt. (2018). PLoS ONE. Retrieved from: <https://doi.org/10.1371/journal.pone.0194970>
- ³ Jambeck, J.R. et al. Plastic waste inputs from land into the ocean. (2015). Science. Retrieved from: http://science.sciencemag.org/content/347/6223/768?sso=1&sso_redirect_count=1&oauth-code=fcfa76fb-eeda-411e-a795-433f2a762dfc
- ⁴ World Economic Forum, Ellen MacArthur Foundation, McKinsey & Company. The New Plastics Economy – rethinking the future of plastics. (2016). Retrieved from <https://www.ellenmacarthurfoundation.org/publications>
- ⁵ Geyer, R.G., Jambeck, J.R., Law, K.L. Production, use, and fate of all plastics ever made. (2017). Science Advances. Retrieved from <http://advances.sciencemag.org/content/3/7/e1700782.full>
- ⁶ Ivar do Sul, J.A. and Costa, M.F. The present and future of microplastic pollution in the marine environment. (2014). Environmental Pollution.
- ⁷ New York State Attorney General Eric T. Schneiderman. Unseen Threat: how microbeads harm New York waters, wildlife, health and environment. (2014). Retrieved from https://ag.ny.gov/pdfs/Microbeads_Report_5_14_14.pdf
- ⁸ Rochman, C.M. et al. Early warning signs of endocrine disruption in adult fish from the ingestion of polyethylene with and without sorbed chemical pollutants from marine environment. (2014). Science of the total environment. Retrieved from <https://rochmanlab.files.wordpress.com/2016/08/rochman-et-al-2014-ed.pdf>
- ⁹ Factsheet: marine pollution. (2017). United Nations, Ocean Conference. Retrieved from https://sustainabledevelopment.un.org/content/documents/Ocean_Factsheet_Pollution.pdf
- ¹⁰ Ibid.
- ¹¹ International Agency for Research on Cancer (IARC). Vinyl chloride monograph. Retrieved from <https://monographs.iarc.fr/wp-content/uploads/2018/06/mono100F-31.pdf>
- ¹² International Agency for Research on Cancer (IARC). List of classifications, volumes 1-122. Retrieved from <https://monographs.iarc.fr/list-of-classifications-volumes/>
- ¹³ Anderson, J.C., Park, B.J., Palace, V.P. Microplastics in aquatic environments: implications for Canadian Ecosystems. (2016). Environmental Pollution. Retrieved from <https://www.sciencedirect.com/science/article/pii/S0269749116305620>
- ¹⁴ International Agency for Research on Cancer (IARC). Vinyl chloride monograph. Retrieved from <https://monographs.iarc.fr/wp-content/uploads/2018/06/mono100F-31.pdf>
- ¹⁵ International Agency for Research on Cancer (IARC). List of classifications, volumes 1-122. Retrieved from <https://monographs.iarc.fr/list-of-classifications-volumes/>
- ¹⁶ Government of Canada. Share and view ideas: Moving Canada toward zero plastic waste. Retrieved from https://www.canada.ca/en/environment-climate-change/services/managing-reducing-waste/consultations/moving-toward-zero-plastic-waste.html?utm_source=canada_carousel&utm_medium=banner_en&utm_content=enr_theme&utm_campaign=plastics_launch2018
- ¹⁷ Hoffman, M.J., Hittinger, E. Inventory and transport of plastic debris in the Laurentian Great Lakes. (2017). Marine Pollution Bulletin. Retrieved from: <https://www.sciencedirect.com/science/article/pii/S0025326X1630981X>
- ¹⁸ Canadian Council of Ministers of the Environment. Progress Report on the Canada-wide Action Plan for Extended Producer Responsibility. (2014). Retrieved from: <https://www.ccme.ca/files/Resources/waste/extended/CAP-EPR%20Progress%20Report.pdf>
- ¹⁹ Chung, E. Your lifestyle is making blue box recycling unsustainable. (2018, March 27). CBC. Retrieved from: <https://www.cbc.ca/news/technology/recycling-blue-box-challenges-evolving-tonne-1.4584484>
- ²⁰ World Economic Forum, Ellen MacArthur Foundation, McKinsey & Company. The New Plastics Economy – rethinking the future of plastics. (2016). Retrieved from <https://www.ellenmacarthurfoundation.org/publications>
- ²¹ Department for Environment, Food & Rural Affairs. UK Government rallies Commonwealth to unite on marine waste. (2018, April 18). Retrieved from: <https://www.gov.uk/government/news/uk-government-rallies-commonwealth-to-unite-on-marine-waste>
- ²² Reuters. Kenya brings in world's toughest plastic bag ban: four years jail or \$40,000 fine. (2017, August 28). The Guardian. Retrieved from: <https://www.theguardian.com/environment/2017/aug/28/kenya-brings-in-worlds-toughest-plastic-bag-ban-four-years-jail-or-40000-fine>
- ²³ European Commission. Proposal for a Directive of the European Parliament and of the Council on the reduction of the impact of certain plastic products on the environment. (2018). Retrieved from: http://ec.europa.eu/environment/circular-economy/pdf/single-use_plastics_proposal.pdf
- ²⁴ G7 2018 Charlevoix. Ocean Plastics Charter. (2018, June). Retrieved from: <https://g7.gc.ca/wp-content/uploads/2018/06/OceanPlasticsCharter.pdf>
- ²⁵ Ellen MacArthur Foundation. Schools of Thought: Cradle to Cradle. Circular Economy. (Retrieved 2018, August 29). Retrieved from: <https://www.ellenmacarthurfoundation.org/circular-economy/schools-of-thought/cradle2cradle>

- ²⁶ United States Environmental Protection Agency. Energy Recovery: Basic Information. (Retrieved 2018, August 29). Retrieved from: <https://archive.epa.gov/epawaste/nonhaz/municipal/web/html/basic.html>
- ²⁷ European Commission. Integrated pollution prevention and control, reference document on the best available techniques for waste incineration. (2006). Retrieved from: http://eippcb.jrc.ec.europa.eu/reference/BREF/wi_bref_0806.pdf
- ²⁸ Verma, R., Vinoda, K.S., Papireddy, M., Gowda, A.N.S. Toxic pollutants from plastic waste – a review. (2016). *Procedia Environmental Sciences*. Retrieved from: https://ac.els-cdn.com/S187802961630158X/1-s2.0-S187802961630158X-main.pdf?_tid=b16a6cea-cae9-4280-92d3-78360b83ffb4&acdnat=1536780007_61d13669e6c981c4af59dfee0c503ece
- ²⁹ Canadian Chamber of Commerce. Accelerating domestic Styrofoam reuse and remanufacture for environmental and economic gain. (2015). Retrieved from: <http://www.chamber.ca/download.aspx?t=0&pid=34e22ef6-9051-e511-b3cc-000c29c04ade>
- ³⁰ Environment Canada, Health Canada. Screening assessment report on hexabromocyclododecane. (2011). Chemical abstracts service. Retrieved from: <https://www.ec.gc.ca/ese-ees/7882C148-8AE4-4BA4-8555-668C49F91500/HBCD%20-%20FSAR%20-%20EN.pdf>
- ³¹ Barry, V., Winquist, A., Steenland, K. Perfluorooctanoic acid (PFOA) exposures and incident cancers among adults living near a chemical plant. (2013). *Environmental Health Perspectives*. Retrieved from: <https://ehp.niehs.nih.gov/doi/pdf/10.1289/ehp.1306615>
- ³² International Agency for Research on Cancer (IARC). List of classifications, volumes 1-122. Retrieved from <https://monographs.iarc.fr/list-of-classifications-volumes/>
- ³³ Association of Municipalities of Ontario, Regional Public Works Commissioners of Ontario, Municipal Waste Association, City of Toronto. Comments on Canada's plastics consultation. (2018). Retrieved from: <http://www.amo.on.ca/AMO-PDFs/Reports/2018/>
- ³⁴ Coyne, J. Why Canada must push for a G7 plastics charter. (2018, June 3). *The Globe and Mail*. Retrieved from: <https://www.theglobeandmail.com/business/commentary/article-why-canada-must-push-for-a-g7-plastics-charter/>
- ³⁵ Waters, C.N., et al. The Anthropocene is functionally and stratigraphically distinct from the Holocene. (2016, January 08). *Science*. Retrieved from: <http://science.sciencemag.org/content/351/6269/aad2622>
- ³⁶ Cózar, A. et al. The Arctic Ocean as a dead end for floating plastics in the North Atlantic branch of the Thermohaline Circulation. (2017). *Sciences Advances*. Retrieved from <http://advances.sciencemag.org/content/3/4/e1600582>
- ³⁷ Chiba, S et al. Human footprint in the abyss: 30 year records of deep-sea plastic debris. (2018). *Marine Policy*. Retrieved from: <https://www.sciencedirect.com/science/article/pii/S0308597X17305195>
- ³⁸ Orb Media. Invisibles. (2017). Retrieved from: https://orbmedia.org/stories/Invisibles_plastics/multimedia
- ³⁹ Orb Media. Plus Plastics (2018). Retrieved from: <https://orbmedia.org/stories/plus-plastic/multimedia>
- ⁴⁰ Group of Experts on the Scientific Aspects of Marine Environmental Protection (GESAMP). Sources, fates and effects of microplastics in the marine environment – a global assessment. (2015). Retrieved from http://ec.europa.eu/environment/marine/good-environmental-status/descriptor-10/pdf/GESAMP_microplastics%20full%20study.pdf
- ⁴¹ New York State Attorney General Eric T. Schneiderman. Unseen Threat: how microbeads harm New York waters, wildlife, health and environment. (2014). Retrieved from https://ag.ny.gov/pdfs/Microbeads_Report_5_14_14.pdf
- ⁴² Rochman, C.M. et al. Early warning signs of endocrine disruption in adult fish from the ingestion of polyethylene with and without sorbed chemical pollutants from marine environment. (2014). *Science of the total environment*. Retrieved from <https://rochmanlab.files.wordpress.com/2016/08/rochman-et-al-2014-ed.pdf>
- ⁴³ Government of Canada. Share and view ideas: Moving Canada toward zero plastic waste. Retrieved from https://www.canada.ca/en/environment-climate-change/services/managing-reducing-waste/consultations/moving-toward-zero-plastic-waste.html?utm_source=canada_carousel&utm_medium=banner_en&utm_content=enr_theme&utm_campaign=plastics_launch2018
- ⁴⁴ G7 2018 Charlevoix. Ocean Plastics Charter. (2018, June). Retrieved from: <https://g7.gc.ca/wp-content/uploads/2018/06/OceanPlasticsCharter.pdf>

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Supported by the Ken and Debbie Rubin Public Interest Advocacy Fund

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