



What problems does this look to solve?

Litter and Water Pollution

- Minnesotans throw away more than 500 tons of plastic bags and packaging every day. That's more than 12 pounds every second.¹
- The MPCA states that in Minnesota plastic bag recycling is less than 10%².
- It is estimated that 22 million pounds of plastic pollution enter the Great Lakes annually³.
- Once plastic enters the environment, it never leaves – it just becomes smaller and smaller pieces of plastic called micro-particles. More than 5 trillion plastic pieces weighing over 250,000 tons contaminate our oceans.⁴
- The Great Lakes and oceans are now contaminated with tons of micro-particle pollution. This plastic pollution then acts as a reservoir for toxic chemicals.⁵
- Fish are now preferentially eating plastic particles, killing them.⁶
- Plastic bags are now among the top 12 items of debris most often found along global ocean coastlines.⁷
- Polystyrene foam (PS) does not biodegrade and is not easily recycled. It may break into small pieces, even minuscule pieces. But the smaller PS foam gets, the harder it is to clean up.
- Polystyrene foam (PS), is pervasive in the marine environment. Like most plastics, polystyrene is lightweight and floats. When littered, it is carried from streets and through storm drains out to the ocean.⁸

Waste

- One Duluth grocery store gives out approximately 1.5 millions annually and cost the store approximately \$60,000/year⁹
- Minnesotans throw away 87,000 tons of plastic bags every year.¹⁰
- In Duluth, most plastic bags end up in the landfill.
- Less than 5% of standard HDPE plastic bags are recycled in the US, while more than 49% of paper bags are recycled.¹¹

- Styrofoam is not recycled through the WLSSD bluebox program.¹²
- Styrofoam ingestion is hazardous to marine animals.¹³

Lifestyle Impacts

- All bags require energy, create waste, cause greenhouse gas emissions, and produce air and water pollution.¹⁴
- Single-use paper bags create 64 pounds of greenhouse gas emissions and 31 pounds of water pollution per every 10,000 bags manufactured.¹⁵
- Single-use plastic bags create 9 pounds of solid waste, 18 pounds of greenhouse gas emissions and 2 pounds of water pollution per 10,000 uses.¹⁶
- A greater than 50% reduction in bag related global warming emissions can be achieved through a switch from single use bags to reusable carry-out bags.¹⁷
- Plastic bags negatively impact single sort recycling facilities. They wrap around sorting machines, requiring the sorting line to be shut down several times a day.¹⁸
- The building block of PS is Styrene, Styrene is classified as a possible human carcinogen by the International Agency for Research on Cancer (IARC).
- Styrene can migrate from polystyrene containers into food and beverages when heated, or in contact with fatty or acidic foods.¹⁹

¹ <https://www.pca.state.mn.us/news/what%E2%80%99s-new-ecoexperience15-minnesota-state-fair>

² <http://www.startribune.com/state-s-pollution-fighters-hope-bagnado-whips-up-storm-of-consciousness-at-state-fair/322561431/>

³ <http://www.duluthnewtribune.com/news/4184733-great-lakes-get-22-million-pounds-plastics-annually>

⁴ Plastic Pollution in the World's Oceans: More than 5 Trillion Plastic Pieces Weighing over 250,000 Tons Afloat at Sea, Eriksen et al, PLOS Dec 2014

⁵ Chemical Pollutants Sorbed to Ingested Microbeads from Personal Care Products Accumulate in Fish Peter Wardrop, Jeff Shimeta, Dayanthi Nugegoda, Paul D. Morrison, Ana Miranda, Min Tang, and Bradley O. Clarke *Environmental Science & Technology* 2016

⁶ <http://science.sciencemag.org/content/352/6290/1213>

⁷ <http://www.oceanconservancy.org/our-work/international-coastal-cleanup/top-10-items-found-1.html>

⁸ California Coastal Commission / Miriam Gordon (2006) "Eliminating Land-based Discharges of Marine Debris in California: A Plan of Action from The Plastic Debris Project," at 2 and 15 www.plasticdebris.org

⁹ Bagit Coordinator Jamie Harvie conversation with store manager January 4th, 2016

¹⁰ <http://www.startribune.com/state-s-pollution-fighters-hope-bagnado-whips-up-storm-of-consciousness-at-state-fair/322561431/>

¹¹ "Bring Your Own Bag" Ordinance - City of Minneapolis 2016 www.minneapolismn.gov/meetings/legislation/WCMSP-175657

¹² <http://wlsd.com/services/recycling/recycling-for-residents/>

¹³ Styrofoam Debris as a Source of Hazardous Additives for Marine Organisms Mi Jang, Won Joon Shim, Gi Myung Han, Manviri Rani, Young Kyoung Song, and Sang Hee Hong *Environmental Science & Technology* 2016 50 (10), 4951-4960

¹⁴ Franklin Associates, Ltd, *Resource and Environmental Profile Analysis of Polyethylene and Unbleached Paper Grocery Sacks*. <http://plastics.americanchemistry.com/Analysis-of-Polyethylene-and-Unbleached-Paper-Grocery-Sacks>

¹⁵ Ibid

¹⁶ Ibid

¹⁷ <https://energycenter.org/sites/default/files/Plastic-Bag-Ban-Web-Version-10-22-13-CK.pdf>

¹⁸ Curbside Recycling: Plastics and program characteristics - MPCA <https://www.pca.state.mn.us/sites/default/files/p-rrr1-04.pdf>

¹⁹ Agency for Toxic Substances & Disease Registry, U.S. Department of Health and Human Services: *ToxFAQs for Styrene*, September 2007: <<http://www.atsdr.cdc.gov/tfacts53.pdf>>; International Agency for Research on Cancer, "Overall Evaluations of Carcinogenicity to Humans," <<http://monographs.iarc.fr/ENG/Classification/crthallist.php>>. J.L. O'Donoghue,

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