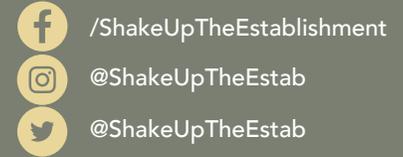


Waste & Pollution

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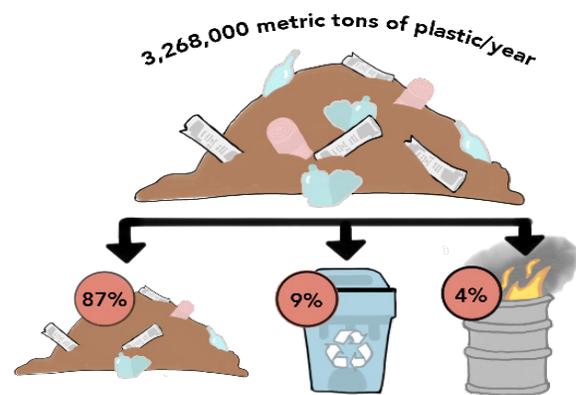
Editors: Manvi Bhalla, Taro Halfnight, Christina DiCarlo, Janaya Campbell

Our habits of careless wastefulness have proven harmful to the environment, and it is essential for the betterment of our environment and for the mitigation of climate change that we become more aware of our waste and pollution.

Organic waste which breaks down and decomposes in landfills, produces methane; a potent greenhouse gas (GHG). In Canada, this accounts for 20% of our national methane emissions (1).

Reducing food waste reduces GHG emissions and your carbon footprint. The Commission for Environmental Cooperation has concluded that food waste is a major contributor to climate change, suggesting that approximately 396 kilograms or 873 pounds per person per year of food waste is created (2). It also has financial incentives: wasting less food can save you \$1,400 a year (3).

Beyond climate change, which is largely a product of global warming, Earth is facing a broad-scale alteration of its landscape and its ecological diversity. Human-produced pollution has found its way into every corner of our environment; for example, when Victor Vescovo completed the deepest ever submarine dive at the Mariana Trench, on May 1st 2019, he came back with reports of plastic bags and candy wrappers at the bottom (4).



Illustrated by Chloe Graham

Figure 1. In Canada, around 3,268,000 metric tons of plastic are discarded each year, and only about 9% of that (305,000 metric tons) is recycled (2). Around 4% is incinerated, and the remaining 87% is left to sit in landfills (2).

The foreword to the United Nations (UN) 2018 report on single-use plastics presents a dire picture of how humans treat the natural world, stating that we treat our oceans as a “dumping ground, choking marine life and transforming some marine areas into a plastic soup” (5). Plastic waste also clogs drains in our cities, leading to floods which incubate disease and also enters the food chain through consumption by livestock (5). Many nations are now acting to combat the problem of plastic, introducing bans on single-use plastic products and/or fines for using those products (5).

Marine plastic pollution has increased tenfold in the last 40 years, which has had a negative effect on roughly 267 species. The species that have been negatively affected include 86% of marine turtles, 44% of seabirds, and 43% of marine mammals; recent studies have begun to show that freshwater birds are also affected by pollution at similar rates (6, 7). Another side effect of our plastics crisis are microplastics, which are plastic particles less than 5 mm in size, originating from either direct manufacturing or degradation of normal plastics (9). Microplastics have infiltrated nearly all natural ecosystems and are worrying due to their ability to alter the chemical makeup of the environment, the toxic effects they have on organisms, and the rate at which they are inadvertently consumed by humans (8, 9).

Wastewater is also a problem facing our environment. Roughly 80% of our global wastewater re-enters the oceans without treatment, allowing heavy metals, solvents, toxic sludge, and many other pollutants to contaminate our marine ecosystem (6). A particularly gripping issue in Canada is that of tailing ponds, which are toxic residual pools from mining and resource extraction, such as bitumen from oil sands or minerals such as copper or gold from ores (12). Contents of Alberta's tailing ponds are seeping into nearby rivers, making them a far-reaching environmental hazard; moreover, these ponds are responsible for the deaths of thousands of birds each year who mistakenly land in their waters (12).

From the evidence outlined above, it is clear that waste management and reduction are essential to a comprehensive climate action plan.

From Practice to Policy

Initiatives are beginning all over Canada to ban these plastics from use. Provinces such as British Columbia, Quebec, and Prince Edward Island have all implemented restrictions and/or have fully banned single-use plastics. At the national level, the Federal government has announced plans to ban single-use plastics nationwide by 2021 (10, 11).

Deloitte & Cheminfo Services find in their 2019 report on Plastic Management data from 2016 that Canada discards around 3.3 kilotonnes of plastic each year. Of this total, about 9%, or 305 thousand tonnes, is recycled, 4% is incinerated, and the remaining 87% is left to accumulate in landfills (1). Approximately 1% of total plastics discarded each year are released into the environment (1). The unrecovered plastic represents a waste of \$7.7 billion annually (1).

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