

Plastic Pollution and Circular Economy

Georgian Triangle Lifelong Learning Lecture

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Our plastic consumption habit, powered by the endless supply of disposable products has outpaced waste management, which has resulted in a huge amount of plastic waste escaping our waste systems and reaching the environment. We will discuss how circular economy can promote solutions to the plastic pollution problem.

Overview of key points and references:

1. ***History of plastic.*** *Plastic was first invented to replace demand for items that were becoming difficult to find. However, its proliferation helped to create a growing market to a modern consumer society.*
 - Jeffrey L. Meikle, *American Plastic: A Cultural History* (New Brunswick, NJ: Rutgers University Press, 1995), 26.
 - Heather Davis, *Life & Death in the Anthropocene: A Short History of Plastic* <https://heathermdavis.com/wp-content/uploads/2014/08/Life-and-Death-in-the-Anthropocene.pdf>
 - Roland Geyer, *A Brief History of Plastics, Mare Plasticum - The Plastic Sea*, 2020, p.31-47; Cham: Springer International Publishing.
2. ***Plastic in the environment.*** *Plastic waste enters the world's oceans, rivers and lakes, accumulating in the environment and threatening wildlife. Microplastics are also becoming part of planetary cycles.*
 - Borrelle SB, Ringma J, Law KL, et al. Predicted growth in plastic waste exceeds efforts to mitigate plastic pollution. *Science*. 2020;369(6510):1515-1518. doi:10.1126/science.aba3656
 - J. R. Jambeck, R. Geyer, C. Wilcox, T. R. Siegler, M. Perryman, A. Andrady, R. Narayan, K. L. Law, Marine pollution. Plastic waste inputs from land into the ocean. *Science* **347**, 768–771 (2015).
 - Munno, K., Helm, P.A., Rochman, C., George, T., Jackson, D.A. (2022). Microplastic contamination in Great Lakes fish. *Conservation Biology*, 36, e13794. <https://doi.org/10.1111/cobi.13794>
 - McIlwraith, H.K., Kim, J., Helm, P., Bhavsar, S.P., Metzger, J.S., Rochman, C.M. 2021. Evidence of microplastic translocation in wild-caught fish and implications for microplastic accumulation dynamics in food webs. *Environmental Science and Technology*.

3. ***Recycling.*** *Costs associated with collecting and handling plastics often outweigh their potential value in recycling markets. Actions need to happen to incentivize investment in recycling programs.*
- Avalon Diggle, Tony R. Walker, Implementation of harmonized Extended Producer Responsibility strategies to incentivize recovery of single-use plastic packaging waste in Canada, Waste Management, Volume 110, 2020, Pages 20-23, ISSN 0956-053X, <https://doi.org/10.1016/j.wasman.2020.05.013>.
 - Calvin Lakhan, Diversion, but at what cost? The economic challenges of recycling in Ontario, Resources, Conservation and Recycling, Volume 95, 2015, Pages 133-142, ISSN 0921-3449, <https://doi.org/10.1016/j.resconrec.2014.12.007>.
 - Canada. Science assessment of plastic pollution, 2020 <https://www.canada.ca/en/environment-climate-change/services/evaluating-existing-substances/science-assessment-plastic-pollution.html>
 - Canada. Objectives, Guidelines and Codes of Practice, 2021. <https://laws-lois.justice.gc.ca/eng/acts/c-15.31/page-5.html#h-6379>
4. ***Single-use plastics and circular economy.*** *Single-use plastics are one of the most common types of macroplastics found on shorelines internationally. Actions can reduce single-use plastics as we move toward a circular economy.*
- Canada. Single-use Plastics Prohibition Regulations – Overview, 2022. <https://www.canada.ca/en/environment-climate-change/services/managing-reducing-waste/reduce-plastic-waste/single-use-plastic-overview.html>
 - Toronto. Reducing Single-use & Takeaway items, 2022. <https://www.toronto.ca/services-payments/recycling-organics-garbage/long-term-waste-strategy/reducing-single-use-takeaway-items/>
 - U of T Trash Team. Ditching disposables: Single-use Foodware, 2022. <https://uofttrashteam.ca/singleusefoodware/>

Short Videos to watch

The life of Plastic: <https://youtu.be/LoGejM9eIDM>

What happens to your recycling? https://youtu.be/Y_C0HmYOTzE

Are bioplastics an answer? https://youtu.be/O_hMAnU39I8

Cigarette Butts are plastics. <https://www.youtube.com/watch?v=Yuftex4oLQc>