

PLASTIC IN SWITZERLAND

DATA COLLECTION: Studies, surveys and estimates (see list of sources)

Wädenswil, January 2023

Plastic consumption in Switzerland

- In Switzerland, around 1 Mt of plastic are used per year (reference year 2010)¹. That makes, 127 kg/ per capita annually².
- Switzerland consumes an estimated 287.5 million disposable hot beverage cups annually (data for 2019). That is about 33 cups per person. Not included are disposable cups for cold drinks.
- Plastic bags:
 - The consumption of plastic bags in Switzerland decreased significantly after the conclusion of two industry agreements in 2016 and 2019. Since then, 56 million of the lightweight single-use plastic carrier bags are still in use annually. Usage thus fell by 86% between 2016 and 2018.
 - There are still 20 million reusable plastic bags in use, their use decreased between 2019 and 2020.
 - However, these data only concern the partners to the agreement. Takeaways, where single-use plastic bags are still ubiquitous, are not included. Also missing are figures on very thin plastic carrier bags, as they are often used for loose food (fruit, vegetables). Accordingly, the actual number of plastic bags handed out in Switzerland is not known and, in any case, higher than the published figures.
- 43.2% of plastics in Switzerland is used in the packaging industry³.

Plastic waste in Switzerland / Recycling

- Every Swiss resident produces an average of 95 kg of plastic waste per year⁴. That is around 0.26 kg of plastic waste per day.
- About 85-90% of plastic waste is incinerated instead of recycled.
- In the end, only about 10% of all plastics in Switzerland are recycled⁵. Since a considerable part of this plastic consists of PET bottles⁶, the quantities of other recycled plastics are even smaller
- Mixed plastics are being collected at a few separate collection points, but most of these are incinerated as they cannot be made usable.
- One of the largest applications for recycled material from (mixed) plastic collections in Switzerland is the pipe industry⁷.

Plastic pollution of the Swiss environment

- Every year around 14'000 tons of macro- and microplastics find their way into our soils, surface waters and their sediments. Most of this plastic input comes from tire abrasion (around 8'900 tons) followed by littering (around 2'700 tons) and other sources⁸.
- The waste problem does not only affect international coasts and waters. 100 tonnes of macroplastics, pieces larger than 5 mm, already end up in Swiss waters, according to the Swiss Federal Laboratories for Materials Testing and Research (Empa). Around 4,400 tonnes of macroplastics are deposited in our soils⁹.
- According to projections, every month an average of 10,000-13,000 kg of plastic ends up in Swiss lakes and rivers¹⁰.

- About 55 tonnes of plastic are estimated to end up in Lake Geneva every year. By now, an estimated 580 tonnes have accumulated in the lake¹¹.
- Packaging waste is the biggest problem for Swiss waters and soils.
- Over the past 30 years, from 1988 to 2018, around 200'000 tons of micro-rubber have accumulated in the Swiss environment; i.e., 0.96 kg/ person/year. 74% are deposited on road soils, 22% in surface waters, 4% in soils¹².
- Clean-up actions reveal the omnipresence of cigarette butts in the Swiss environment as a major source of plastic pollution. They are the most littered item in the country¹³.

Microplastics are everywhere in the Swiss environment: in all large lakes, in floodplains and nature reserves, up to remote mountain lakes - and even in alpine snow.

- It is estimated that there are 53 tons of microplastics in Swiss nature reserves. Microplastics were found in 90% of the floodplain soils examined. Where there was a lot of plastic waste, the concentration of microplastics in the soil was also high¹⁴. Huge quantities of macro- and microplastics end up in the Swiss environment every year, where they continuously accumulate.
- Microplastics are ubiquitous, and considerable amounts have been detected in the snow of the Alps¹⁵.
- Microplastic contamination even has been detected in the remote and uninhabited alpine lake of Sassolo (Tessin)¹⁶.
- A 2013 study in Swiss lakes found microplastics in almost every sample¹⁷.
- Microplastics (MP) were detected in these large Swiss water bodies:
 - Rhine: 240'000 MP particles / km²¹⁸.
 - Lake Neuchâtel: 61'000 MP / km² surface, 700 MP / m² sand
 - Lake Geneva: 220'000 MP / km² surface, 2'100 MP / m² sand
 - Lake Constance: 61'000 MP / m² surface, 320 MP / m² sand
 - Lake Brienz: 36'000 MP / km² surface, 2'500 MP / m² sand
 - Lake Zurich: 11'000 MP / km² surface, 460 MP / m² sand
 - Lake Maggiore: 220'000 MP / km² surface, 1'100 MP / m² sand¹⁹
- Compared to ocean eddies: 100'000-1'000'000 MP / km²²⁰ at least 2.5 times more. – Microplastic pollution in Swiss waters is at least as high, and arguably higher, than in the ocean.

Plastic in the ocean

- It is estimated that around 9 million tonnes of plastics enter the oceans each year worldwide via rivers and sewers, wind drift and tides, and through direct waste disposal²¹.
- However, these 9 million tonnes only refer to the annual plastic input by people living within 50 km of a coast²². In addition, 0.5 million tonnes of plastics enter the oceans annually from inland areas (i.e., landlocked countries), which include Switzerland²³.
- From Switzerland alone, around 20 tonnes of microplastics enter the oceans via rivers every year²⁴.
- The Rhone River is estimated to carry 10 kg of microplastics into France every day²⁵.

Plastics in food are harmful to health

- Particles of PET, polystyrene or polyethylene have been found in food produced in Switzerland. They have been retraced in apples, carrots, salt, or beer produced in Switzerland. The plastics in question are used in objects such as packaging, bottles, pipes and toys. Similar results have been found in other countries²⁶.
- Plastics consist of crude oil and natural gas. Chemicals are added during production, such as hormone-active plasticisers like phthalates or toxic flame retardants made from bromine. Food packaging contains up to 12,000 substances, some of which are toxic, and some are transferred from the

packaging to the food. When we eat, we consume an invisible cocktail of toxic substances. In certain quantities, they damage the nervous system, upset the metabolism, they can lead to obesity and thyroid disorders and also trigger diabetes and infertility.

The problem of plastic pollution in Switzerland is much bigger than the public generally perceives.

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- ¹ <https://www.bafu.admin.ch/bafu/de/home/themen/abfall/abfallwegweiser-a-z/kunststoffe.html> (consulted: 03.01.23).
- ² Own calculation
- ³ https://kunststoff.swiss/Downloads/Daten-und-Fakten/Swiss_Plastics_Wirtschaftsdaten_2017.pdf (consulted: 03.01.23)
- ⁴ 750,000 tonnes of post-consumer plastic waste as given by Schelker & Geisselhardt (2011), [Projekt „Kunststoff-Verwertung Schweiz“ - Bericht Module 1 Und 2 – Redilo](#), / residing population (OFS, [Population – 2010](#) = 7,870,134 persons).
- ⁵ Schelker & Geisselhardt (2011), *op cit*.
- ⁶ <https://www.bafu.admin.ch/dam/bafu/de/dokumente/abfall/statistik/verwertung-von-getraenkeverpackungen-2019.pdf.download.pdf/verwertung-von-getraenkeverpackungen-2019.pdf> (consulted: 03.01.23).
- ⁷ https://irp-cdn.multiscreensite.com/880ae1a0/files/uploaded/APPOLL-Forum_20201112_KST-Kreislaeufo-nachhaltig_SCHELKER_EN%5B148885%5D.pdf (consulted: 03.01.23);
also: <https://pubs.acs.org/doi/10.1021/acs.est.9b02900> (consulted: 03.01.23)
- ⁸ <https://www.bafu.admin.ch/bafu/de/home/themen/abfall/fachinformationen/abfallpolitik-und-massnahmen/kunststoffe-in-umwelt.html> (consulted: 03.01.23)
- ⁹ <https://doi.org/10.1021/acs.est.9b02900> (consulted: 03.01.23); also: <https://www.empa.ch/web/s604/mikroplastik-bafu> (03.01.23).
- ¹⁰ https://vsa.ch/wp-content/uploads/2020/06/Swiss-Litter-Report_2018.pdf (consulted: 03.01.23)
- ¹¹ <https://www.sciencedirect.com/science/article/pii/S0165993618304436?via%3Dihub> (consulted: 13.11.20)
- ¹² <https://www.sciencedirect.com/science/article/abs/pii/S0269749119333998?via%3Dihub> (consulted: 06.11.20); also: <https://www.empa.ch/web/s604/mikrogummi> (consulted: 06.11.20)
- ¹³ https://vsa.ch/wp-content/uploads/2020/06/Swiss-Litter-Report_2018.pdf (consulted: 03.01.23)
- ¹⁴ <https://pubs.acs.org/doi/10.1021/acs.est.7b06003> (consulted: 03.01.23)
- ¹⁵ <https://www.admin.ch/gov/en/start/documentation/media-releases.msg-id-86901.html> (consulted: 03.01.23); also: <https://www.rts.ch/info/monde/12815239-une-etude-montre-la-pollution-des-sommets-alpins-par-les-nanoplastiques.html> (consulted: 03.01.23)
- ¹⁶ <https://doi.org/10.3390/w12092410> (consulted: 03.01.23)
- ¹⁷ <https://www.admin.ch/gov/de/start/dokumentation/medienmitteilungen.msg-id-55628.html> (consulted: 03.01.23)
- ¹⁸ <https://www.nature.com/articles/srep17988> (consulted: 06.11.20)
- ¹⁹ <http://www.plongeplo.ch/documents/conferences/phagmann/csiro2015> (consulted: 06.11.20)
- ²⁰ <https://www.boell.de/de/2017/04/25/meeresatlas-daten-und-fakten-ueber-unseren-umgang-mit-dem-ozean> (consulted: 03.01.23)
- ²¹ <https://doi.org/10.1126/science.1260352> (consulted: 03.01.23)
- ²² *Ibid.*
- ²³ <https://www.news.admin.ch/news/message/attachments/73205.pdf> (consulted: 03.01.23)
- ²⁴ *Ibid.*
- ²⁵ <https://www.eawag.ch/en/research/water-for-ecosystem/pollutants/microplastics/swiss-waters/> (consulted: 03.01.23)
- ²⁶ <https://www.rts.ch/info/sciences-tech/12961644-des-residus-de-plastique-dans-nos-aliments.html> (consulted: 03.01.23)