Sources of aquatic microplastic pollution include microbeads used in personal care products such as facial scrubs and toothpastes, pellets from personal care products and plastic fibers from clothing, fragments of plastic products, and microfiber foams used in the manufacturing of synthetic sports wear. The Pollution Monitoring Program for Water Quality in San Francisco Bay (RMP) characterized Bay surface water and wastewater treatment plant (WWTP) influent for microplastics and found that Bay surface water and WWTP influent samples were enriched in FOAM, FRAGMENT, and FIBER. Two-hour sea surface samples of effluent were collected from eight WWTPs discharging to the Bay. Microplastics in samples were characterized by size, type, and abundance. Forensic analysis of the source for plastic pollution in the San Francisco Bay is presented.

**RESULTS**

- **WWTP EFFLUENT**
  - The night WWTPs discharged on average 30,000,000 particles of microplastic per day (Table 1).
- **Surface Water Samples**
  - About 1/3 of all plastic particles per gallon were smaller than 0.999 mm and were missed by microscopy, offering a potential underestimate of the true microplastic levels in surface water. However, the average abundance of plastic per gallon was higher than observed in the San Francisco Estuary, although still low compared to the Great Lakes (Lam et al. 2015). By contrast, other estuarine regions show much higher microplastic abundances. The Great Lakes have the highest microplastic abundance, with an average of 6,900,000 particles of microplastic per gallon, as compared to the San Francisco Estuary with an average of 6,990,000 ± 4,700,000 particles of microplastic per gallon. The San Francisco Estuary has the greatest abundance of microplastics, followed by Europe’s English Channel and the Great Lakes. These differences in microplastic abundance may be due to differences in local pollution sources or differences in WWTP treatment technologies. WWTPs employing more advanced wastewater treatment technologies did not have an impact on the abundance of microplastics in the Bay. Plastic particles were also observed in wastewater treatment facilities that use older treatment technologies, such as sedimentation and filtration. WWTPs employing more advanced wastewater treatment technologies did not have an impact on the abundance of microplastics in the Bay.
  - Extrapolations using the average discharge per day (0.33 vs. 0.08 particles per gallon), as observed in the San Francisco Estuary, are likely too low, due to the significant contribution of microplastics from other pollution pathways (e.g., plastics from other pollution pathways (e.g., plastics from the San Francisco Estuary, although still low compared to the Great Lakes (Lam et al. 2015). By contrast, other estuarine regions show much higher microplastic abundances. The Great Lakes have the highest microplastic abundance, with an average of 6,900,000 particles of microplastic per gallon, as compared to the San Francisco Estuary with an average of 6,990,000 ± 4,700,000 particles of microplastic per gallon. The San Francisco Estuary has the greatest abundance of microplastics, followed by Europe’s English Channel and the Great Lakes. These differences in microplastic abundance may be due to differences in local pollution sources or differences in WWTP treatment technologies. WWTPs employing more advanced wastewater treatment technologies did not have an impact on the abundance of microplastics in the Bay. Plastic particles were also observed in wastewater treatment facilities that use older treatment technologies, such as sedimentation and filtration. WWTPs employing more advanced wastewater treatment technologies did not have an impact on the abundance of microplastics in the Bay.
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