

# LITTER ON GREAT LAKES BEACHES

## Citizen science datasets reveal drivers of spatial and temporal variation for anthropogenic litter on Great Lakes beaches

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This study investigated patterns of distribution and abundance of anthropogenic litter on Great Lakes beaches to infer the dominant sources of litter and inform management strategies. The Alliance for the Great Lakes used data collected by citizen scientist (2,298 volunteers, 445 hours, and 157 individual datasets). Results suggest improved management of local litter sources is key for litter reduction on Great Lakes beaches. *Vincent, et al. (2017) Sci Total Environ. 577:105–12*

### Aims

The main objective was to identify the source and quantity anthropogenic litter (AL) in Great Lake ecosystems. Litter is a major human impact in freshwater bodies. More information is necessary to develop efficient management strategies to reduce AL on a local and global scale. The study aimed to:

- quantify AL composition to infer the dominant sources on different beach types.
- compare AL density according to land-use.
- examine seasonal variations in AL density.

### Approach

This study used citizen scientist data to analyze AL distribution on 9 Great Lakes Beaches in Illinois and New York. Beaches were selected where data collection was completed by volunteers with identical training including citizen scientists participating in the HSBC Water Programme.

Citizen scientists collected and analysed all AL observed and uploaded this data to an open database. Minimum AL collection size was approximately 1 cm. Spatial analysis of the surrounding lake catchment was used to determine impervious surface cover, location of wastewater treatment discharges and catchment area.

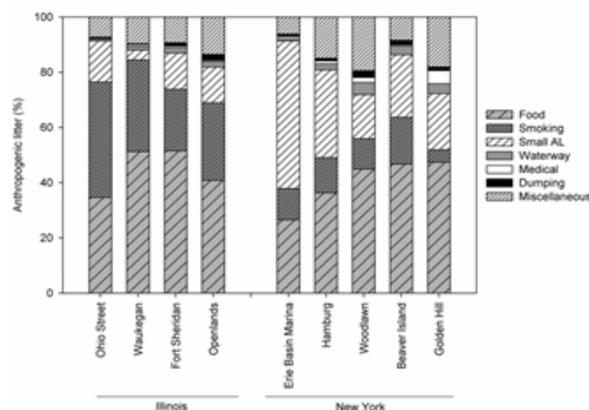
### Impacts

The results suggest that datasets generated by citizen scientists provide fundamental information for the ecological research into the impacts of anthropogenic litter, its distribution and fate in freshwater systems across the entire watershed of the Great Lakes.



### Key results

- Results suggest local land management is the most effective for litter reduction on Great Lakes beaches.
- Density of AL was higher in urban beaches, regardless of which lake the beach was on, suggesting on site littering was a primary source of AL.
- Summer has the lowest amount of litter.
- To increase the reliability of citizen science data, paired beach surveys could be conducted by research professionals to determine effect of the sampling bias.



Relative distribution of anthropogenic litter collected at 9 Great Lakes beaches in Illinois and New York.