



# **Mississippi River Plastic Pollution Initiative**

## **QUAD CITIES SCIENCE REPORT**

DAVENPORT, IA; ROCK ISLAND, IL; BETTENDORF, IA; MOLINE, IL; EAST MOLINE, IL

**University of Georgia**

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# Foreword

The Mississippi River is America's most essential inland waterway, providing hundreds of billions of gallons of water each day to key industries, as well as drinking water to 20 million people in 50 cities in 10 states. The river is rich in biodiversity, supporting the livelihoods of people living along the river as well as a wide range of plant and animal species.

But the river also hosts a threatening foreign substance—plastic pollution. Plastic litter that continuously enters the Mississippi River poses a large threat to environmental quality and ecosystem health, and these impacts extend far beyond the river valley. Up to 80% of marine plastic originates from land-based sources, and as the drainage system for 40% of the continental United States, this pollution travels through storm drains and smaller waterways into the river and its tributaries, ultimately making its way to the Gulf of Mexico and into the ocean.

Approximately 11 million metric tons of plastic enters the oceans each year, so understanding the extent of the plastic pollution problem is key to devising effective solutions. The United Nations Environment Programme's North America Office, the Mississippi River

Cities and Towns Initiative and University of Georgia's Debris Tracker have come together through the Mississippi River Plastic Pollution Initiative to generate a first ever snapshot of plastic pollution along the River.

Using a citizen science approach, this initiative facilitated and supported data collection at key sites along the river in the Spring of 2021. The aim was to understand the movement and accumulation of plastic pollution while painting as rich a picture as possible within a small amount of time of the extent, type, and brand of plastic litter along the river. Following a successful phase of initial data collection in three pilot cities, the initiative expanded to the Quad Cities.

The intention of this Mississippi River Plastic Pollution Initiative Quad Cities Science Report is to generate information about plastic waste concentrations in specific areas, which all stakeholders—from policy makers, to businesses and citizens—can use to take action within their communities. We hope that this research will not only help cities and towns in Iowa and Illinois, but also provide an example of what can be done collectively to address the plastic pollution crisis around the world.

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**On behalf of:**

The Mississippi River Plastic Pollution Initiative

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## Executive Summary

The United Nations Environment Programme (UNEP) North America Office, the Mississippi River Cities and Towns Initiative (MRCTI), the University of Georgia's Debris Tracker, and other local and national partners are working together as part of the Mississippi River Plastic Pollution Initiative to generate a first-ever snapshot of the state of plastic pollution along the Mississippi River.

Hundreds of community volunteers surveyed targeted areas in the Quad Cities to understand the movement and accumulation of plastic pollution, generating key data through a citizen science approach. Community members collected data with Debris Tracker, an open data citizen science movement and free mobile phone app.

The cities that participated in this phase of data collection included: Davenport, Iowa; Bettendorf, Iowa; Rock Island, Illinois; Moline, Illinois; and East Moline, Illinois. The data gathered in the Quad Cities was examined to understand the state of plastic litter, generating as rich a picture as possible, within a dedicated timeframe, of the extent and type of litter that can make its way to the river.

This project consisted of scientific strategy development and refinement, volunteer training and outreach, field data collection, and data analysis and reporting. The community training and data collection occurred from September–October, 2021. The initiative was successful in engaging citizen scientists with 24,943 total litter items logged in the Quad Cities from October 1–31, 2021. Plastic was the top material found, comprising 76% of the items logged in the Quad Cities.

While there was some variation of litter across the cities as described in more detail in the report, the top ten items remained relatively consistent: cigarette butts, food wrappers, paper and cardboard, film/foam/hard plastic fragments, aluminum cans, beverage bottles, and plastic bags were some of the most common items found. Personal Protective Equipment (PPE), an emerging contaminant in the environment and waterways, was a consistent 1-2% of the items found (by count).

Each of the Quad Cities was successful in collecting adequate data to provide a baseline snapshot of the litter in each city. The average litter density (calculated by the number of litter items over the area surveyed in count/m<sup>2</sup>) across all sites in the Quad Cities is 0.53 items/m<sup>2</sup>. To visualize this density, imagine that when observing a 1-m (3-ft) wide path while walking along a 100 m city block, one would see 53 litter items. The litter densities are similar for Rock Island, Moline, and East Moline, but are relatively lower in Davenport and Bettendorf (Table ES-1). Litter densities of 0.6–0.7 items/m<sup>2</sup> are consistent with findings in Baton Rouge (0.61 items/m<sup>2</sup>) and St. Louis (0.69 items/m<sup>2</sup>) during the initial pilot phase of the initiative conducted in April 2021. The litter density in Bettendorf is similar to that found in St. Paul (0.28 items/m<sup>2</sup>) during the pilot phase as well. Further analysis of data and influencing factors could help to better evaluate both the similarities and the differences in the litter density data, and repeated surveying could help establish trends and further verify initial findings.

**Table ES 1: Quad Cities Litter Summary Data**

City	Items (Count)	# of Sites Surveyed (square kilometers)	Average Litter Density (items/m <sup>2</sup> )
Davenport	17,460	41	0.50
Bettendorf	1,168	12	0.20
Rock Island	1,935	10	0.73
Moline	3,263	13	0.71
East Moline	1,107	5	0.61

Community volunteers reported brand information for 470 items, about 2% of the total items logged. Of these, 192 unique brand names were identified. These brand names were then associated with their parent companies. In total, 113 parent companies were identified in the litter in the Quad Cities, representing an opportunity to engage a myriad of stakeholders to address plastic pollution in the region.

Essential to the success of this project is the participation of communities, especially the leadership and engagement of the Mayors and Mayors' offices. Results from the Quad Cities initiative were presented to the Mayors and city officials, as well as city partners, in November 2021. Based upon the project core partners and discussions with the cities and local partners, the following opportunities for reducing plastic pollution in the Mississippi River have been identified:

- Items like PET bottles and aluminum cans are highly recyclable. Access to recycling in public spaces could be further examined.
- Improved automation and access to return centers might enhance the existing deposit return program in Iowa.
- Straws found in commercial and mixed-use areas might present an opportunity for changes to business practices, such as straw by request policies.
- Litter found in parking lots might suggest the need to expand availability of waste management services at these locations.
- The wide variety of brands identified means there is potential to engage numerous brand stakeholders in solutions.
- Municipal contracts could be used to enforce cleanup prior to mowing, require litter cleanup at construction sites, and require waste collectors to reduce leakage from automated garbage collection.
- Local policy could help support installation of cigarette receptacles.
- Exploring new materials could reduce plastic consumption, although waste management capacity for new materials needs to be taken into account.
- Expanded communication and messaging around plastic pollution in the Quad Cities could bring together new partners to address this issue.

The next steps for this initiative are to continue dialogues in the pilot cities, as well as between stakeholders, to take action in order to address plastic pollution in their communities, protect their local environments, the Mississippi River, the global ocean and beyond.

## Introduction

### Background

The Mississippi River flows over 2,000 miles from its headwaters in Minnesota to the Gulf of Mexico. The basin drains 40% of the United States and encompasses 32 states. It is one of America's most essential inland waterways, supporting the livelihoods of people along the river, and it is home to diverse plant and animal species. The Mississippi River generates over \$400 billion in revenue and supports over 1.5 million jobs.<sup>1</sup> But plastic pollution is a significant problem throughout the Mississippi River Basin, and the river is often impacted by our actions on land. Items that we use every day – like disposable coffee cups, water bottles, masks and plastic bags – can end up in the environment and ultimately be blown by wind or washed by rainfall into the river.

Recognizing the urgency of the plastic pollution problem, state legislators and mayors of cities and towns along the Mississippi River made a commitment to reduce plastic waste in the Mississippi River Valley in September 2018. Under the leadership of the Mississippi River Cities and Towns Initiative (MRCTI), mayors invited public and private entities to reduce their plastic use or waste stream by 20% by 2020.

To support this commitment, [The United Nations Environment Programme \(UNEP\) North America Office](#), the [Mississippi River Cities and Towns Initiative \(MRCTI\)](#), the [University of Georgia's Debris Tracker](#), and other partners are working together on the Mississippi River Plastic Pollution Initiative to generate a first-ever snapshot of the state of plastic pollution along the Mississippi River. Following an initial pilot phase in April 2021, data collection was expanded to the Quad Cities region in October 2021. Hundreds of community volunteers surveyed targeted areas

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