

Title of Research: 23-5-08

Assessing sources, emissions and environmental risk of microplastics in support of effective risk reduction strategies

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Summary of Research:

The objective of this research project is to facilitate realistic and effective risk management strategies against microplastic (MP) pollution by analyzing the load and sources of MP, and conducting practical risk assessments focused on Tokyo Bay. Specifically, leveraging material flow analysis and precise field data, our goal is to quantitatively assess the sources of MP pollution in marine environments and their respective contributions. Additionally, we aim to quantify the temporal changes in MP-related environmental risks and the efficacy of various mitigation measures. Moreover, we propose an environmental risk assessment methodology tailored to the unique characteristics of MP, drawing from practical case studies in Tokyo Bay and the latest insights from both domestic and international sources.

Timeline:

March 2025 – February 2026

Topics:

Presented at the LRI annual research meeting of JCIA. August 29, 2025.

Publications:

I Ueda K, Kameda Y, Fujita E, Fujimura G, Fukazawa E, Numazawa Y, Iwasaki Y, Naito W. (2025). Size-specific distribution, morphology, and polymer composition of microplastic particles in surface water and sediments of Tokyo Bay. *Microplastics and Nanoplastics*, 5(1), 47.
<https://doi.org/10.1186/s43591-025-00168-z>

Iwasaki Y, Takeshita K, Ueda K, Naito W. Bayesian species sensitivity distribution modeling for microplastic particles: integrating particle characteristics and intra-species variation. *Environmental Toxicology and Chemistry (ET&C)*, Accepted (10 March, 2026)

Naito W, Ueda K, Iwasaki Y. Ueda K., Comparison of species sensitivity distribution modeling approaches for assessing risk of microplastic particles using monitoring data from Tokyo Bay. SETAC Europe 35th Annual Meeting, 11-15 May 2025, Vienna, Austria