14.4.2. Making Plastic Pollution More Visible and Preventable

Introduction

Marine plastic pollution begins long before litter is observed at sea. Waste-prevention policies, the pathways that carry debris through watersheds, and the accumulation of plastics in aquatic organisms each offer a different perspective on the same environmental problem. Building an evidence base across those perspectives can help research institutions and resource managers decide where to focus prevention, monitoring, and public education.

During Academic Year 2024–2025, Davao Oriental State University (DOrSU) contributed new local research on the possible seasonal movement of plastics from 39 rivers around Davao Gulf and on microplastic occurrence in rabbitfish from Pujada Bay. These research outputs sit alongside an existing university policy discouraging single-use plastics and earlier published work documenting debris in Pujada Bay mangrove forests.

The accounts distinguish activities and publications from older institutional measures. Computational simulations describe possible transport pathways, a study of fish gastrointestinal tracts provides local biological evidence, and the campus policy identifies an established prevention framework. None of these sources by itself measures a decline in plastic use or the amount of litter in coastal waters during the reporting year.

A Pre Existing Campus Framework for Reducing Disposable Plastics

DOrSU's Single-Use Plastic-Free policy provides an institutional starting point for waste prevention. Adopted under Board of Trustees Resolution No. 2019-25, its implementing rules took effect on February 3, 2023, before AY 2024–2025. The rules cover campus constituents, visitors, concessionaires, and caterers, and encourage reusable alternatives.

This policy is retained as background to the university's later pollution research. The cited advisory establishes the policy framework; records of enforcement and waste quantities during AY 2024–2025 would be needed to measure its implementation and effect.

The policy also identifies the campus as a setting where prevention can be discussed through everyday decisions about disposable materials. Its coverage of concessionaires and caterers connects institutional rules with services used by the university community. For the reporting year, the policy serves as an existing framework. The volume of plastics avoided and the consistency of implementation remain questions for operational records and monitoring (Davao Oriental State College of Science and Technology, 2019; DOrSU PIO, 2023).

References

Davao Oriental State College of Science and Technology (now Davao Oriental State University). Single-Use Plastic-Free DOSCST. Board of Trustees Resolution No. 2019-25. Institutional policy. Available through the university's official communication channels.

DOrSU-PIO. Public Advisory: Implementing Rules and Regulations (IRR) of the Single-Use Plastic-Free DOrSU Policy, enforced on February 3, 2023. Official Facebook page of Davao Oriental State University (dorsuofficial), official public communication. Retrieved from https://www.facebook.com/dorsuofficial/posts/pfbid02xq5BKamzihCGNqmg2JiYDg7NnHdGAMyqdvFY7W1zvBw9daM9iTPg2gEKpFiR4wSbl

Tracing Plastic From Rivers to the Gulf

DOrSU researchers used Python-based OpenDrift modelling to examine seasonal movement of plastic from 39 rivers around Davao Gulf. Supported by the United Nations Development Programme and ADDVentures Innovation Center, the work identified likely transport and accumulation patterns.

Led by Dr. Jonathan S. Cabrera with Wilkin Simo, Cindy Lasco, Lanie Laureano, and Danver Palmiano, the team received Best Paper recognition at InvENT on July 23–24, 2025. The model provides information for targeting monitoring and waste-management action; it does not measure a completed reduction in marine litter.

The model shifts attention from individual litter observations to possible connections among river outlets and coastal accumulation areas. This can help frame where field checks may be useful and which local governments may need to coordinate. Because the results are simulations, their strongest practical use is as a guide to investigation and prioritisation alongside observations; the award recognises the research contribution rather than a completed clean-up outcome (DOrSU PIO, 2025).

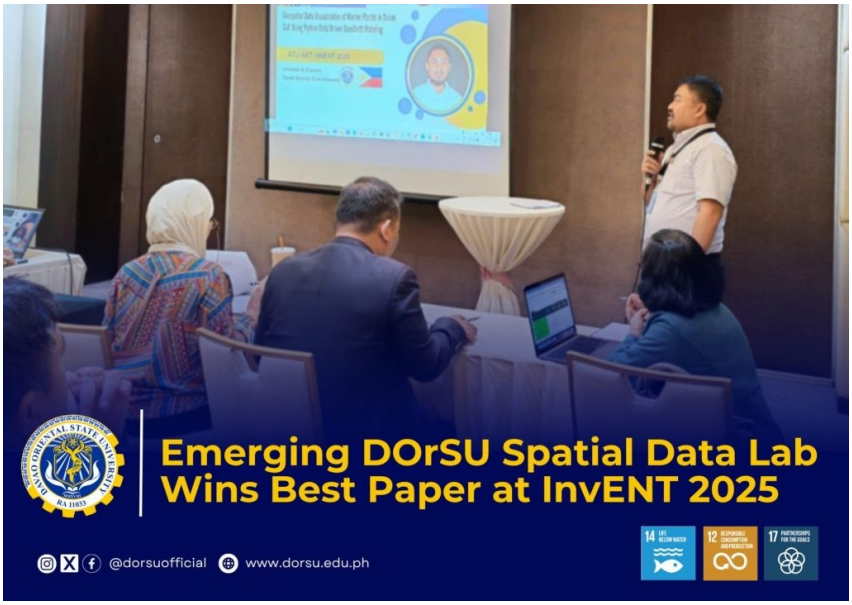

Figure 1. DOrSU's institutional presentation graphic documents the marine-plastic modelling research and Best Paper recognition at InvENT, July 23–24, 2025. It includes an actual event photograph. Photo/graphic credit: DOrSU–Public Information Office.

References

Davao Oriental State University, Public Information Office. (2025, July 24). Emerging DOrSU Spatial Data Lab Wins Best Paper at InvENT 2025. Retrieved from https://dorsu.edu.ph/emerging-dorsu-spatial-data-lab-wins-best-paper-at-invent-2025/

Documenting Plastic Contamination in Local Fisheries

Plastic pollution is also present in organisms that communities harvest for food. DOrSU researchers Lahoy and Antonio examined microplastic occurrence in the gastrointestinal tract of rabbitfish (Siganus canaliculatus) from Pujada Bay, with the study published in 2025.

Connected with the university's wider aquatic research and RIC-XI laboratory activities, the findings provide local evidence of plastic exposure in a commercially important fish. They strengthen the case for waste prevention and further monitoring.

Studying a locally harvested species connects marine pollution with an organism familiar to resource users. The research can help educators explain that plastic exposure is an ecological concern extending beyond visible shoreline litter. The finding concerns the gastrointestinal tract; it does not establish

contamination levels in edible muscle or quantify human health risk. Its immediate contribution is evidence supporting prevention and further investigation (Lahoy & Antonio, 2025).

References

Lahoy, N. M., & Antonio, E. S. (2025). Microplastic occurrence in the gastrointestinal tract of rabbitfish (Siganus canaliculatus) in Pujada Bay, Philippines. Davao Research Journal, 16(2), 49–61. https://doi.org/10.59120/drj.v16i2.377

Research Context for Plastic Prevention in Mangroves

Earlier research documented anthropogenic marine debris in Pujada Bay mangrove forests. This adds a habitat perspective to the current report: plastic prevention matters not only at the point of disposal, but also where debris reaches coastal vegetation and associated habitats.

Read with the newer fish-contamination study and plastic-drift presentation, the earlier work supports a connected view of pollution across habitats and organisms. Its evidence predates the academic year and is not used as a current estimate of litter abundance or policy effectiveness (Abreo et al., 2020).

References

Abreo, N. A. S., Siblos, S. K. V., & Macusi, E. D. (2020). Anthropogenic marine debris (AMD) in mangrove forests of Pujada Bay, Davao Oriental, Philippines. Journal of Marine and Island Cultures, 9(1), 38–53. https://doi.org/10.21463/jmic.2020.09.1.03

Scopus record in supplied export. Retrieved from https://www.scopus.com/pages/publications/85099004478?origin=resultslist

Conclusion

DOrSU's contribution under Indicator 14.4.2 links pollution prevention with research on the movement and occurrence of plastics in the coastal environment. The OpenDrift modelling study provides a basis for investigating potential river-to-gulf transport pathways, while the 2025 rabbitfish study adds evidence of microplastic exposure in a locally harvested species. Earlier work in mangrove habitats supplies ecological context for why prevention should address several connected parts of the coastal system.

The university's Single-Use Plastic-Free policy remains relevant as an existing institutional framework, but its 2019 adoption and 2023 implementation rules must not be reported as new AY 2024–2025 accomplishments. Likewise, simulations and contamination findings should not be mistaken for achieved litter reduction, demonstrated policy compliance, or measured health risk to seafood consumers.

Taken together, these sources strengthen the local scientific and institutional basis for responsible waste management. Translating that contribution into verified environmental improvement will depend on subsequent monitoring, field validation, documented prevention activities, and sustained coordination among local governments, researchers, campus stakeholders, and coastal communities.