**CASE STUDY**

**Marine Microplastics Pollution Analysis using Power BI**

**📌 Analysing Global Microplastics Distribution using Power BI**

**🎯 Objective**

The goal of this project was to visualize and analyse microplastic pollution across global marine environments using geospatial data. The analysis aimed to uncover patterns in plastic concentrations, identify high-risk zones, and communicate environmental impacts through interactive visuals.

**📁 Data Source**

The dataset was obtained from the **ArcGIS Open Data Portal**, and it contains global marine microplastic pollution measurements in **WGS84 coordinate format**. It includes:

* Latitude & longitude
* Microplastic counts (particles per cubic meter)
* Sample dates
* Sampling depth
* Collection method

**🛠 Tools & Techniques Used**

* **Power BI**: For interactive dashboard creation and reporting
* **Power Query**: For data cleaning and transformation
* **DAX**: For calculated columns and metrics
* **Mapping Visuals**: To represent geospatial data on world maps

**🧹 Data Cleaning & Preparation**

* Filtered out incomplete or null records (missing coordinates or counts)
* Standardized measurement units where required
* Converted geospatial values into numeric format for Power BI maps
* Grouped and aggregated data by region, year, and sampling depth

**📊 Visualizations Created**

* **World Map**: Showing microplastic concentrations using bubble maps
* **Bar Chart**: Top 10 regions with highest pollution levels
* **Line Chart**: Trends of pollution over time
* **Filters & Slicers**: For interactive analysis by year, region, or depth

**🔍 Key Insights**

* Coastal regions in **Asia and Europe** had notably higher microplastic concentrations.
* The **surface sampling depth (0–5m)** showed the most consistent presence of plastics.
* **2017–2019** had the highest number of recorded observations.
* Several data clusters appeared near industrial shipping lanes, indicating a possible link between maritime activity and pollution.

**📌 Conclusion**

This project demonstrates how Power BI can be used not only for business intelligence, but also for environmental awareness and public research. By analysing global microplastics data, the dashboard enables stakeholders to explore pollution trends and support data-driven marine protection initiatives.