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PLASTIC SMOG ALERT:

**NEW RESEARCH PAPER REVEALS THERE ARE MORE THAN 170 TRILLION PIECES OF PLASTIC AFLOAT
IN THE WORLD'S OCEANS**

An Analysis of Ocean Plastic Trends Over Time Reveals an Urgent Need for Policy Interventions

SANTA MONICA, CALIFORNIA (March 8, 2023) – A research paper published today in PLOS ONE¹ reveals there are more than 170 trillion plastic particles, weighing approximately 2 million tonnes, afloat in the world's oceans. By evaluating trends of ocean plastic from 1979 to 2019, the authors observe a rapid increase of marine plastic pollution and make an urgent call for policy measures focused on source reduction and reuse rather than recycling and cleanup.

Understanding occurrence and trends of plastic in the environment are foundational to assessing current and potential future risks to humans and ecosystems. The co-authors used previously published and new data (11,777 samples) of floating ocean plastics to create a global time series that estimates the average counts and mass of microplastics in the ocean surface layer. The paper also offers a historic overview of international policy measures aimed at reducing plastic pollution to evaluate their effectiveness.

From 2005 onward, there is a rapid increase in the mass and abundance of ocean plastic, which may reflect exponential increases in plastic production, fragmentation of existing plastic pollution, or changes in terrestrial waste generation and management. Without immediate action, the rate of plastic entering aquatic environments is expected to increase approximately 2.6 fold from 2016 to 2040². This acceleration of marine plastic pollution demands urgent international policy intervention at the source of plastic production and product manufacture – before waste is generated – in order to minimize ecological, social, and economic harm.

“The exponential increase in microplastics across the world's oceans is a stark warning that we must act now at a global scale, stop focusing on cleanup and recycling, and usher in an age of corporate responsibility for the entire life of the things they make,” said Dr. Marcus Eriksen, Co-Founder of The 5 Gyres Institute. “Cleanup is futile if we continue to produce plastic at the current rate, and we have

¹ <https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0281596>

² <https://www.science.org/doi/10.1126/science.aba3656>

heard about recycling for too long while the plastic industry simultaneously rejects any commitments to buy recycled material or design for recyclability. It's time to address the plastic problem at the source.”

We are at a turning point in history, with United Nations Member States adopting a resolution to end plastic pollution at UNEA 5.2 last year³. Existing international policies on plastic are fragmented, lack specificity, and do not include measurable targets. Creating binding and enforceable international agreements focused on source reduction is the best long-term solution. As treaty negotiations are underway, it's crucial to establish a legally binding global treaty that addresses the full life cycle of plastic, from extraction and manufacturing to its end of life.

The 5 Gyres Institute published the first Global Estimate of Marine Plastic Pollution in 2014⁴, which determined there were more than 5 trillion plastic particles afloat in the ocean. The updated paper brings together many of the same co-authors and scientists who are leaders in ocean plastic research, including Edward Carpenter, who published the first paper on plastic in the ocean in 1972; Robert Day, who first discovered plastic in the North Pacific in 1985; and Charles Moore, who discovered the Great Pacific Garbage Patch in 1997.

For more information, visit 5gyres.org/plasticmog.

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About The 5 Gyres Institute

The 5 Gyres Institute is a leader in the global movement against plastic pollution with more than 10 years of expertise in scientific research and engagement on plastic pollution issues. Since 2009, the team has completed 19 expeditions, bringing more than 300 citizen scientists, corporate executives, brands, and celebrities to the gyres, lakes, and rivers to conduct first-hand research on plastic pollution. Through this research, 5 Gyres engages diverse stakeholders in understanding the science to drive impact as well as conduct community outreach and citizen science to implement data-driven solutions. With over 1,400 Ambassadors in 66 countries, 5 Gyres supports and is supported by community members with information, tools and connections to help drive local change to fight this global crisis.

³<https://www.unep.org/news-and-stories/press-release/historic-day-campaign-beat-plastic-pollution-nations-commit-develop>

⁴ <https://journals.plos.org/plosone/article/authors?id=10.1371/journal.pone.0111913>

Author Quotes:

“The exponential increase in microplastics across the world’s oceans is a stark warning that we must act now at a global scale, stop focusing on cleanup and recycling, and usher in an age of corporate responsibility for the entire life of the things they make. Cleanup is futile if we continue to produce plastic at the current rate, and we have heard about recycling for too long while the plastic industry simultaneously rejects any commitments to buy recycled material or design for recyclability. It’s time to address the plastic problem at the source.” – **Dr. Marcus Eriksen, Co-Founder of The 5 Gyres Institute**

“We know that microplastics are everywhere, and as far as solutions go, they’re going upstream -- finding ways to limit emissions that are close to the source. But, what we’ve learned in the past fifteen years is that there can be harm from plastic all the way from the extraction of fossil fuels to the disposal of products at their end of life. So, in developing solutions, the full lifecycle of plastic must be taken into account.” – **Dr. Lisa Erdle, Director of Research and Innovation at The 5 Gyres Institute**

“The increasing accumulation of plastic particles in our environments and bodies will eventually lead to the inability for the planet to sustain life as we know it. Now is the time for governments worldwide to unite in their efforts to reduce plastic production and further prevent its escape into the environment.” – **Dr. Scott Coffin, Research Scientist at the California State Water Resources Control Board**

“The presence of plastics, in all sizes, shapes, and forms, is increasing uncontrollably everywhere. It is imperative that we think of plastics as a wicked social and environmental problem. It is a material that creates damage all along its life cycle, from drilling up fossil fuels to the spread of microplastics in waterways, the soil, and the atmosphere. To tackle plastics pollution effectively, we must address it in a *systemic* way.” – **Patricia Villarrubia Gomez, PhD Candidate, Stockholm Resilience Centre, Stockholm University**

"We know the ocean is a vital ecosystem and we have solutions to prevent plastic pollution. But, plastic pollution continues to grow and has a toxic effect on marine life. There must be legislation to limit the production and sale of single-use plastics or marine life will be further degraded. Humans need healthy oceans for a liveable planet." – **Dr. Edward J. Carpenter, Professor, Estuary & Ocean Science Center, San Francisco State University**

"We need decision makers' help in solving the plastic pollution crisis. Corporations need to choose materials that are sustainable for the environment and designed to last beyond one lifetime. As a global society, we can learn to thrive while being happy with less stuff." – **Dr. Martin Thiel, Director of Citizen Science Program Cientificos de la Basura, Coquimbo, Chile**

“This research opened my eyes to how challenging plastic in the ocean is to measure and characterize and underscores the need for real solutions to the problem. Let's transition to a zero waste future!” – **Dr. Win Cowger, Research Scientist at Moore Institute for Plastic Pollution Research**

Break Free From Plastic Partner Quotes:

“The same industry that plays a role in plastic plays a role in the climate crisis. Time is vital; extreme climate disasters hit our area with growing frequency, and the danger of explosions and emissions from chemical disasters from oil, gas, and petrochemical facilities multiplies—toxic emissions from plastic production cause reproductive, developmental, and other mutagenic and multigenerational harm in our communities.” – **Yvette Arellano, Founder and Director of Fenceline Watch (Houston, Texas)**

“Each plastic particle you find in the ocean is inextricably linked to communities like mine through the fracking that produced the raw materials, and the land, water, and air pollution that accompanies that extraction. Pollution from the extraction and production phases of the plastic life cycle are often invisible, but the human health impacts and downstream pollution are not. Addressing the full life cycle is the only way to protect not only our oceans, but also our communities.” – **Sarah Martik, Deputy Director at Center for Coalfield Justice (Southwestern Pennsylvania)**

"Historically, vulnerable populations have consistently played a major role in plastic waste management despite being neglected in waste management systems and being significantly affected by plastic production. In the case of Tanzania, companies with revenue higher than the country's GDP produce plastic that we don't have the capacity to manage, neither should it be our responsibility, and send it to our markets. These products do not make goods available to people unless they can afford them, so we face the contradiction of people drinking untreated water while their environment and waterways are filled with plastic bottles.

The Global Plastic Treaty is the otherwise missing opportunity to design a legally binding instrument that addresses the full lifecycle of plastics and promotes environmental justice. Vulnerable communities, mostly in the Global South, must not continue to be profit enablers for companies and countries, mostly in the Global North. We must have our dignity respected and valued." – **Ana Rocha Executive Director, Nipe Fagio (Tanzania)**

"There is microplastic contamination on land and in 68 rivers spread across 24 provinces on 9 islands in Indonesia. This pollution is caused by local sources and by plastic waste imports from western countries. It is time for global governments to create a legally binding plastics treaty that addresses the full life-cycle of plastic, so plastic pollution does not leak into the environment in Indonesia anymore." – **Prigi Arisandi, Co-founder of ECOTON (East Java, Indonesia)**

“Almost all plastics are derived from petrochemicals, and communities of color are disproportionately surrounded by petrochemical facilities. Unfortunately, our communities often lack access to the resources and infrastructure needed to address the problem. We need to create more green spaces, invest in renewable energy sources, and encourage businesses to switch to sustainable materials. We need to create more educational opportunities for individuals in our communities to understand the environmental impact of plastic and petrochemicals. And finally, we need to advocate for greater resources and support to help communities of color address the issue of plastic pollution. By working

together, we can help protect our environment and ensure that everyone has access to clean air and water.” – **Roishetta Sibley Ozane, Founder of The Vessel Project of Louisiana**