



Science
INSIGHTS®
Journal of The Bono Academy of Science & Education



From Science to Science: Lessons Learned from the Disappearing Plastic Gyres

Haibo Wu, Wei Wang, Shiqin Xu

Science Insights 2014; 9(2):237-238

doi: <http://dx.doi.org/10.15354/si.14.ps016>

Science Insights is published by The Bono Academy of Science & Education, Chapel Hill, NC 27510,
USA

Copyright © 2014 The Bono Academy of Science & Education. All rights reserved.

p-ISSN: 2372-8191

e-ISSN: 2329-5856

DOI: 10.15354/issn.2329-5856

The online version of this article, along with updated information and services, is located on the
World Wide Web at:

www.bonoi.org

Permissions: Requests for permissions to reproduce figures, tables, or portions of articles originally published in *Science Insights* can be obtained via our [Permission Application System](#), a service of the Copyright Clearance Center. If you cannot access to this system, you can request permission through toour Editorial Office. Once the online version of the published article for which permission is being requested is located, Request Permissions in the middle column of the Web page under Services. Further information about this process is available in the Permissions and Rights Question and Answer document.

Submission: Information about submission to *Science Insights* please see online [For Authors](#).

From Science to Science: Lessons Learned from the Disappearing Plastic Gyres

Haibo Wu,^{*,1} Wei Wang,^{*,1} Shiqin Xu^{*,Δ}

SUMMARY In scientific age we are experiencing daily changes with unbelievable speed, yet we are also paying back for the sequence that science caused. It is may be a joke for our human being. When the first plastic bag was used in the supermarket decades ago, people appraised it as a record-broken invention. We must say yes that plastic products truly help us much in each field, but are the benefits of the plastic really outweigh the harmful effect on our daily life and health? The newly reported report said it was hard to give an in-depth evaluation of the long-term impact of plastic debris consumed by marine creatures on our ecosystems. It is only an example, but the real thing we today should consider is that what the potential effect of the science development on us, and on the whole biological system. If we need pay two dollars back to solve the problems arose from the one-dollar original cost, is it reasonable? The fact we now facing is exactly as this. Today's scientific work potentiates us far more spending on the science-related acts. ■

*:Department of Anesthesiology, Nanjing Maternity and Child Health Care Hospital, Nanjing Medical University, Nanjing 210004, China

Δ:Correspondence to: Shiqin Xu, No. 123, Tianfei Xiang, Mochou Road, Nanjing 210004, Jiangsu, China. Tel: 025-5222-6112; Email: xusqnj@njmu.edu.cn

1. These authors contributed equally to this work.

Submitted: 16 May 2014
Revised: 21 June 2014
Accepted: 05 July 2014

Doi: 10.15354/si.14.ps016

SCIENCE INSIGHTS 2014;
9(2):237-238.

Copyright © 2014 The BASE. This is an open access article distributed under the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.



How to Cite This Paper: Wu J, Wang W, Xu S. From Science to Science: Lessons Learned from the Disappearing Plastic Gyres. Science Insights 2014;9(2):237-238.

DOI: <http://dx.doi.org/10.15354/si.14.ps016>

Keywords: Plastics - Lesson - Science - Cost

THE appearance of the plastics makes our daily life be convenient at the expense of the environment “white pollution”. The modern period has been dubbed the “Plastic Age”. People use it, but they do not know how to treat it at the earlier period of time the hard-to-be-decomposed material was made. Today, you can hear word “recyclable” everywhere, and also more and more nations recognize the potential hazard of plastic prod-

ucts on our health and the surrounding settings and consequently various regulations and laws were released for controlling the use of plastic, at least it should be made of recyclable material and labeled apparently on the products with the “Recyclable Logo”.

In the early time of the usage of the plastics, tones and tones of different plastic waste were discarded and eventually piled up or streamed down into ocean; some of the detritus were

carried by the storm water runoff. Ocean currents, acting as giant conveyor belts, then carry the plastic into several subtropical regions, such as the infamous vast midocean “gyres” – Pacific Ocean Garbage Patch. In the 1970s, the National Academy of Sciences of America estimated that about 45,000 tons of plastic reaches the oceans every year. Since then, the world's production of plastic has quintupled.

When people do not know what should be done on these giant floating mass, one interesting thing happened as reported by the scientists from the University of Cadiz in Spain and University of Western Australia in Australia: the plastic garbage littering the surface of the ocean may be disappearing. Decades ago, it was scientists made it – the plastic; decades later, it was also scientist said that it is disappearing. Exactly what is happening to this ocean debris is a mystery, though the researchers hypothesize that the trash could be breaking down into tiny, undetectable pieces. Alternatively, the garbage may be traveling deep into the ocean's interior.

Most of the ocean's floating plastic is expected to be microscopic in size due to broken down by the action of waves and radiation from the sun, but the scientists behind the study used very fine mesh nets that should have been able to pick up even these minuscule fragments. Instead, scientists considered the missing millions of tons could be entering the stomachs of marine animals. It is believable that the small sized were consumed by the ocean biological systems even they don't want to swallow the debris. One ascertained thing is that the plastic pollution in surface waters can more easily interact with the ocean life, because the surface layer of the ocean hosts most of the marine organisms as the researcher pointed out. In addition, small fish



like lanternfishes may be eating some of the small plastic pieces, dubbed microplastics, and breaking them down even more. However, as the important ecological link between plankton and small vertebrates, small fish are eaten by the bigger commercial fish such as swordfish and tuna. Therefore, it is of importance to understand whether the absorption of toxins from the plastic will impact these animals' health.

Scientists noted that the potential impact of the plastic is on us because we human being also are the part of the food web when the tiny plastic enter the global ocean food web. Given the suck-up property of plastic on the pollutants in the water, so it is hard to predict the possible damaging effect on our health when they consumed by parts of the living marine life of the food chain. This effect may be short-term or may be long-term. No matter what happened on the missing plastic, on ascertained fact is that fish and other marine creatures are eating the plastic waste is “indisputable”. With millions of tons of plastic going unaccounted for in our oceans, and the uncertain consequences of animals ingesting such material.

Researchers drew their conclusion about the disappearing trash by analyzing the amount of plastic debris floating in the ocean, as well as global plastic production and disposal rates. The study outlines the findings of scientists who trawled the waters around five large ocean gyres in 2010 and 2011. The data they obtained put them far short of the expected amount of plastic in the ocean – rather than millions of tons, the global load of ocean plastic was calculated at 40,000 tons at most. Because each large piece of plastic can break down



into many additional, smaller pieces of plastic, the researchers expected to find more tiny pieces of debris. But the vast majority of the small plastic pieces, measuring less than 0.2 inches (5 millimeters) in size, were missing, as the researchers said.

Even though the deep ocean is a great unknown, one thing needs to be assured is that our people is changing it using our so-called “scientific way”. When plastic materials were synthesized and different plastic products were slide out from the assembly line, and tons of used were thrown away into ocean, who considered the potential impact of such behavior on our life today? Scientists spent time and money to make them, but in turn scientists spent much more time and money to find their impact on our daily health. However, the worst thing is that it has been being deeply invaded into our life. Sadly, the chronic accumulation of plastic particles would be modifying our surrounding mysterious ecosystem, not only the ocean system, but also the whole biological system before we totally know it. ■

Conflict of Interests

None

Acknowledgements

This work is supported in part by the National Natural Scientific Foundation of China (81271242) to SX.

