**Plastic in the Oceans: Sources and Solutions**

Between five and 13 million tons of plastic waste wind up in the world’s oceans every year, and researchers warn that this amount could increase tenfold in the next decade unless the international community improves its waste management practices. Jenna Jambeck and colleagues combined data on solid waste from 192 different coastal countries with factors such as population density and economic status to reach their conclusions. They estimated the amount of plastic that moved from land to sea in 2010 and identified the major sources of this ocean-bound plastic waste, listing the 20 countries -- from China to the United States -- that delivered the most plastic into the oceans that year. Although many studies have highlighted the presence and location of plastic debris in the world’s oceans over the years, the amount of plastic that enters the seas annually has been unknown. Using their new model, Jambeck and the other researchers suggest that the coastal countries they studied generated about 275 million tons of plastic waste in 2010, and that 4.8 to 12.7 million tons of that waste wound up in the world’s oceans. A country’s population size, along with the quality of its waste management systems, largely determines the amount of its waste that might reach the oceans, according to the researchers. Nations around the world need to reduce waste and adopt better management strategies, such as expanded waste recovery systems, in order to prevent the amount of plastic debris in the world’s oceans from increasing by a full order of magnitude by the year 2025, they say.  
  
**Article #15**: "Plastic waste inputs from land into the ocean," by J.R. Jambeck; M. Perryman at University of Georgia in Athens, GA; R. Geyer at University of California, Santa Barbara in Santa Barbara, CA; C. Wilcox at Commonwealth Scientific and Industrial Research Organization in Hobart, TAS, Australia; T.R. Siegler at DSM Environmental Services in Windsor, VT; A. Andrady at North Carolina State University in Raleigh, NC; R. Narayan at Michigan State University in East Lansing, MI; K.L. Law at Sea Education Association in Woods Hole, MA.  
  
[**DOWNLOAD**](http://www.eurekalert.org/jrnls/sci/emb_scipak/pdf/jambeck150213.pdf) Article #15  
  
[**DOWNLOAD**](http://www.eurekalert.org/jrnls/sci/emb_scipak/pdf/jambeckSOM150213.pdf) Supporting Online Material for Article #15  
  
[**DOWNLOAD**](http://www.eurekalert.org/jrnls/sci/emb_scipak/pdf/Jambeck-bycountry.pdf) Plastic Waste Inputs by Country  
  
**Contact**: Jenna R. Jambeck at [jjambeck@uga.edu](mailto:jjambeck@uga.edu) (email).  
  
**DOI Information**: Reporters wishing to link to this paper's abstract on sciencemag.org can use the following URL: <http://www.sciencemag.org/lookup/doi/10.1126/science.1260352>  
  
**Note:** Additional information on work conducted in Jambeck Laboratory is available [here](http://www.eurekalert.org/jrnls/sci/emb_scipak/pdf/jambeck-additional.pdf).  **Note:** For a list of third-party source recommendations, please contact UGA public information officer Stephanie Schupska at [schupska@gmail.com](mailto:schupska@gmail.com).  
  
**Podcast:** A segment of Science's weekly podcast with Jenna Jambeck, related to this research, will be available when the embargo lifts at [http://traffic.libsyn.com/sciencemag/SciencePodcast\_](http://traffic.libsyn.com/sciencemag/SciencePodcast_YYMMDD.mp3)[150123](http://traffic.libsyn.com/sciencemag/SciencePodcast_150123.mp3)[.mp3](http://traffic.libsyn.com/sciencemag/SciencePodcast_YYMMDD.mp3). Please see [the note below](http://www.eurekalert.org/jrnls/sci/summaries-02-13-15.php#notes) for information about using these broadcasts with appropriate attribution.  
  
**News Release:** A related [news release](http://www.eurekalert.org/emb_releases/2015-02/uog-nsp020515.php) is available from University of Georgia in Athens, GA.  
  
**News Release:** A related [news release](http://www.eurekalert.org/emb_releases/2015-02/sea-nsi020615.php) is available from Sea Education Association in Woods Hole, MA.  
  
**News Release:** A related [news release](http://www.eurekalert.org/emb_releases/2015-02/aaft-hmp020615.php) is available from American Association for the Advancement of Science in Washington, DC.   
  
**News Release:** A related [news release](http://www.eurekalert.org/emb_releases/2015-02/uoc--aoo021015.php) is available from University of California, Santa Barbara in Santa Barbara, CA.

**Images:**

Image 1:

Jenna Jambeck of the University of Georgia collects plastic samples from a beach near Caleta de Famara, Canary Islands, Spain, November 2014.

[Credit: Malin Jacob]

Image 2:

Marine debris and plastic pollution along the coastline of Haiti.

[Credit: Timothy Townsend]

Image3:

Marine debris and plastic pollution along the coastline of Haiti.

[Credit: Timothy Townsend]

Image 4:

Image captions, second row, left to right: Marine debris and plastic pollution along the coastline of Haiti.

[Credit: Timothy Townsend]

Image 5:

Informal solid waste management and recycling in rural India.

[Credit: Jenna Jambeck]

Image 6:

Informal solid waste management and recycling in rural India.

[Credit: Jenna Jambeck]

Image 7:

Landfilled waste in a developed country, the United States.

[Credit: Jenna Jambeck]

Image 8:

Landfilled waste in a developing country, New Delhi, India.

[Credit: Jenna Jambeck]

Image 9:

Plastic in the organic waste stream intended for composting.

[Credit: Jenna Jambeck]

Image 10:

Debris from urban activities and run-off accumulates at the edge of Lake Michigan.

[Credit: Jenna Jambeck]

Image 11:

Plastic samples collected by Jenna Jambeck from Caleta de Famara coast, Canary Islands, Spain in November 2014.

[Credit: Malin Jacob]

Image 12:

Plastic waste inputs from land into the ocean in 2010.

[Credit: Lindsay Robinson/University of Georgia]

**Videos:**

Video 1:

In this video, Jenna Jambeck rinses marine debris she collected from

Caleta de Samara coast, Canary Islands, in November 2014. Jambeck, an assistant professor of environmental engineering at the University of Georgia, visited the area as part of an eXXpedition voyage. All debris was recorded with GPS tags through an app known as Marine Debris Tracker, which Jambeck developed with UGA's Kyle Johnsen.

[Credit: Malin Jacob]