

From: Melissa Gates <mgates@surfrider.org>
Sent: Friday, September 20, 2019 3:16 PM
To: Jacobson, Jonathan
Subject: Re: Straw and Foam

Jonathan: apologies for the add-on but I just saw my note to follow up with the citation for the claim that by 2050 there could be more plastic than fish (by weight) in the ocean, which I neglected to include in the packet I sent your way yesterday.. It's not a short answer but so you have it to pass along as you see fit (also included in the attached updated briefing packet).

This statistic is a projection **based** on findings of a this [study](#); the study itself was limited and uses a few assumptions (as does every life cycle analysis and global estimation study). Here are the issues to consider:

- Estimate of plastic mass in ocean by 2050
 - Assumptions were made to estimate the amount of plastics that enter the ocean in the original study, but as the first study of its kind, the authors are clear that this is an attempt to estimate marine debris from land based plastics using assumptions to make up for data gaps and unknowns (global plastic consumption and production is dependent on population growth, consumer demand, and fossil fuel production, to name a few, and projections will rely heavily on changes in developing countries)
 - The original study also only projected plastic mass until 2025 (ranging from 100-250 million metric tons)
 - [Ellen MacArthur Foundation](#) extended that analysis out to 2050 (not sure if they applied a linear growth model based on the report's findings or what, but it seems like it ranges from 850-950 million metric tons)
- Estimate of fish mass in ocean
 - As you may expect, trying to estimate the amount of fish mass in the ocean is insanely difficult - there is so much we don't know about the marine environment. Any estimate you see about fish biomass on a massive scale is just that - an estimate.
 - This estimate was again based on an actual study using marine primary production (phytoplankton) as a way to estimate the amount of fish biomass that it can support (find study [here](#)) which estimated 899 million metric tons
 - Note: this estimate is of current global fish mass, not the fish mass in 2050
 - Other studies estimate that the fish biomass may actually be in the billions of metric tons
- See [this Science article](#) for a summary of the issues regarding this statistic, which is a simplified version of the [BBC article you linked](#).
- Intended takeaways of the original study I cited to your committee on Tuesday are:

- "Without waste management infrastructure improvements, the cumulative quantity of plastic waste available to enter the ocean from land is predicted to increase by an order of magnitude by 2025."
- "Improving waste management infrastructure in developing countries is paramount and will require substantial resources and time. While such infrastructure is being developed, industrialized countries can take immediate action by reducing waste and curbing the growth of single-use plastics."

Honestly, as our marine life dwindles from destructive overfishing and ocean development practices, in addition to the stressors of a changing climate and increased pollution of all kinds while our production of plastic continues to increase significantly due to the shale boom/future tech advances, odds are not looking good for the marine environment if things don't change. We have the opportunity to change things in Stamford and beyond, and I again applaud your efforts.

Thanks,
Melissa

Melissa Gates | Northeast Regional Manager | [Surfrider Foundation](#) | 207.706.6378 | mgates@surfrider.org