Supplementary material to "A Global Inventory of Small Floating Plastic Debris"

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Supplementary Tables

Study	Years	# samples	Net type	Net mesh (mm)	Reported units		Locale
					Count	Mass	
Carpenter et al (1972)	*1972*	*20*	*NAS reference*	*0.333*	*#/m^3*		*Coastal North Atlantic*
Carpenter & Smith (1972)	*1971*	*11*	*Neuston*	*0.33*	*#/km^2*	*g/km^2*	*Western North Atlantic*
Collignon *et al* (2012)	2010	40	Manta	0.333	#/m^2	mg/m^2	NW Mediterranean Sea
Cozar *et al* (2014)	2009-2013	194	Neuston	0.2	#/km^2	g/km^2	Atlantic, Pacific and Indian Oceans
Day & Shaw (1987)	*1976, 1985*	*31*	*Ring*	*3.0, 0.333*		*mg/m^2*	*North Pacific and Bering Sea*
Doyle *et al* (2011)	2006-2007	271	Sameoto neuston & manta	0.505	#/m^3	mg/m^3	Eastern North Pacific and southeastern Bering Sea
Eriksen *et al* (2013)	2011	48	Manta	0.335	#/km^2	g/km^2	South Pacific
Eriksen *et al* (2014)	2007-2013	393	Manta	0.335	#/m^2	g/km^2	Atlantic, Pacific, Indian and Southern Oceans
Fossi *et al* (2012)	2011	23	WP2	0.2	#/m^3	*	Mediterranean (Ligurian & Sardinian Seas)
Galgani (unpubl.)	2011	36	Manta	0.333	#/m^2	mg/m^2	Mediterranean (Tyrrhenian Sea)
Galgani (unpubl.)	2012	29	Manta	0.333	#/m^2	mg/m^2	Northwestern Mediterranean Sea
Gilfillan *et al* (2009)	1984, 1994, 2007	193	Manta	0.505	#/m^3	mg/m^3	Eastern North Pacific
Goldstein et al (2012)	*1972, 1973*	*45*	*Ovoid & neuston*	*0.505*	*#/m^3*	*mg/m^3*	*Eastern North Pacific*
Goldstein *et al* (2012)	1987, 1999, 2000, 2006,	190	Manta	0.333, 0.505	#/m^3	mg/m^3	Eastern North Pacific

Lattin *et al* (2004)	2002	4	Manta	0.333	#/m^{3}	g/m^{3}	Coastal North Pacific
Law *et al* (2010)	1986, 1987, 1989-2008	6,162	Neuston	0.335	#/km^{2}	§	Western North Atlantic
Law *et al* (2014)	2001-2012	2,530	Neuston	0.335	#/km^{2}	§	North and South Pacific
Moore *et al* (2001)	1999	11	Manta	0.333	#/m^{3}	g/m^{3}	Eastern North Pacific
Moore *et al* (2002)	2000, 2001	10	Manta	0.333	#/m^{3}	g/m^{3}	Coastal North Pacific
Morris (1980)	1979	10	Neuston	0.32	#/km^{2}	^	South Atlantic (Cape Basin)
Reisser *et al* (2013)	2012	171	Manta	0.333, 0.335	#/km^{2}	§	Offshore of Australia
SEA/Law (unpubl.)	2008-2012	1,006	Neuston	0.335	#/km^{2}	§	Western North Atlantic
Shaw (1977)	*1974, 1975*	*71*	*Sameoto neuston*	*0.363*	*#/m^{2}*		*Gulf of Alaska and Bering Sea*
Shaw & Mapes (1979)	*1976*	*14*	*Sameoto neuston*	*0.308*		*mg/m^{2}*	*North Pacific*
Wilcox & Hardesty (unpubl.)	2011-2013	235	Neuston, manta & ring	0.333, 0.335	#/km^{2}	§	Offshore of Australia
Wong et al (1974)	*1972*	*30*	*Neuston*	*0.15*		*mg/m^{2}*	*North Pacific*

Table S1: Studies with available plastic abundance data collected using surface-towing plankton nets. Italics indicate studies that were omitted from analysis because data were collected prior to availability of ECMWF ERA-Interim wind speed data.

* Mass concentration computed from reported counts and average mass of 7.38 x 10^{-4} g/particle from Galgani (2011).

§ Mass concentration computed from reported counts and average mass of 1.36 x 10^{-2} g/particle from Morét-Ferguson *et al* (2010).

^ Mass concentration computed from reported counts and average mass of 6.47 x 10^{-2} g/particle from Carpenter & Smith (1972)

	Maximenko model			**Lebreton model**			**Van Sebille model**		
	Best Est	*Stand C.I.*	*Regr C.I.*	Best Est	*Stand C.I.*	*Regr C.I.*	Best Est	*Stand C.I.*	*Regr C.I.*
Total count unweighted	14.9	*2.1*	*0.5*	31.2	*3.4*	*1.7*	51.2	*3.9*	*2.5*
Total count weighted	14.8	*2.1*	*0.5*	29.6	*3.4*	*1.7*	36.2	*5.6*	*4.9*
Total mass unweighted	93.3	*13.9*	*14.0*	151.5	*21.9*	*25.0*	236.0	*30.7*	*32.0*
Total mass weighted	100.5	*14.1*	*13.0*	139.1	*19.6*	*21.9*	222.6	*30.6*	*27.6*

Table S2: Comparison of the integrated model solutions when weighing the individual observations by $1/n$ in the regression analysis, where n is the number of observations in each 1° x 1° grid cell, compared to the 'unweighted' solution as reported in Tables 2 and 3 in the main manuscript. Total count is given in 10^{12} particles, and total mass is given in thousand metric tons. For each of the three models, the best estimates as well as the 95% confidence intervals related to both the standardization (*Stand C.I.*) and regression (*Regr C.I.*) are given.

Supplementary Figures

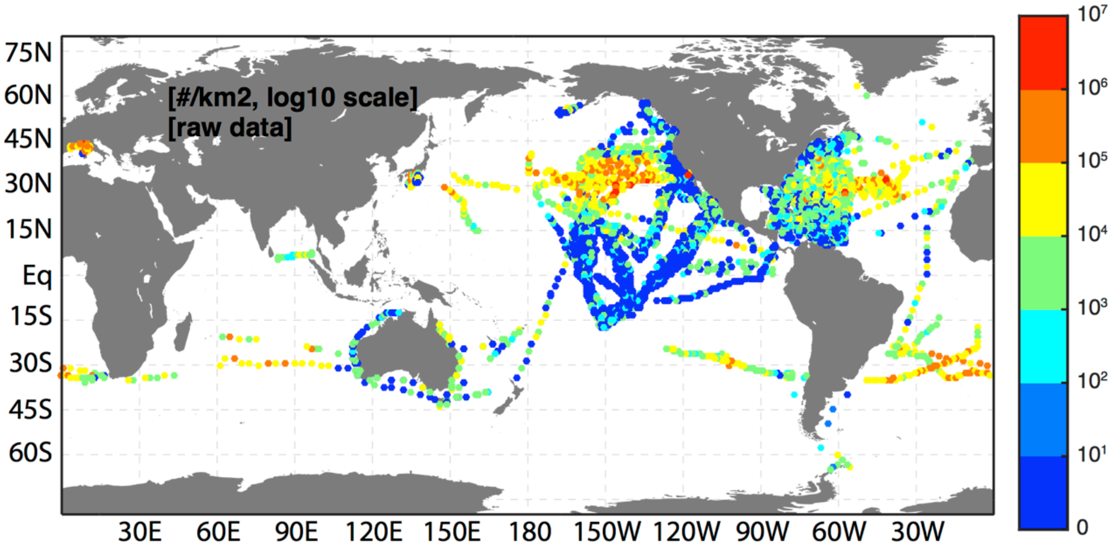

Figure S1: Map of the raw, non-standardized data. Compare with Figure 1a in the main manuscript for the effect of the standardization procedure.

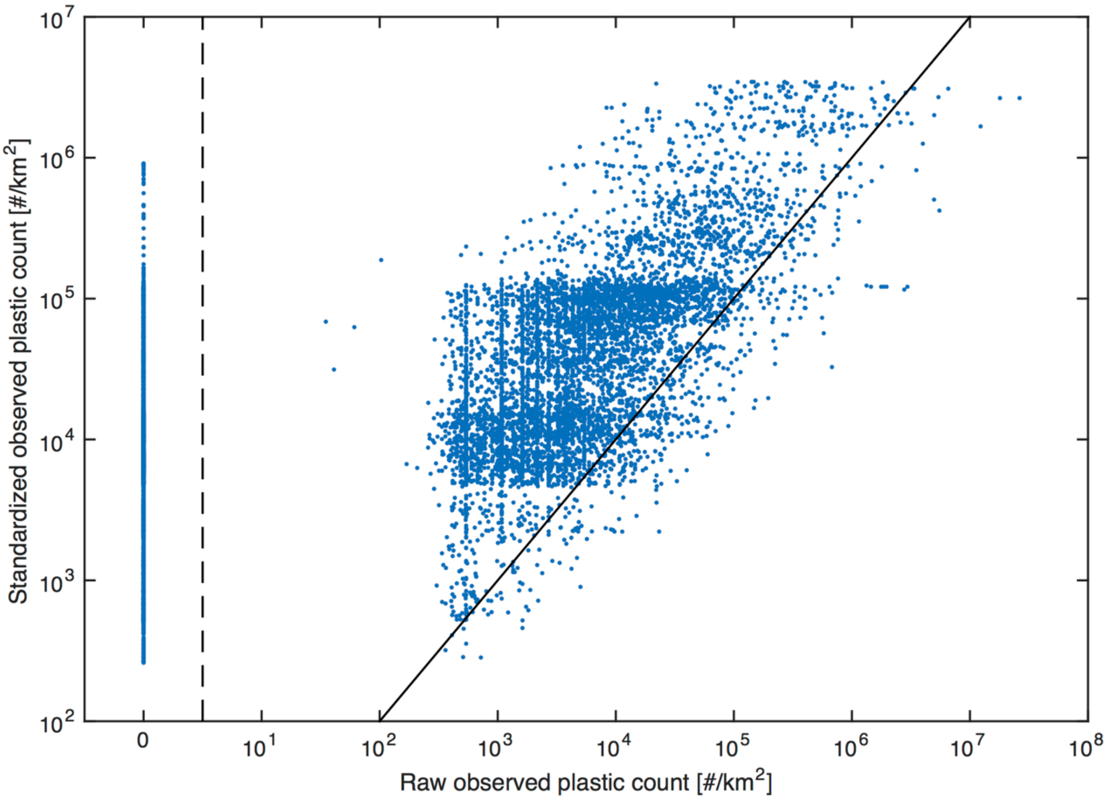

Figure S2: Comparison of standardized and raw values for plastic counts from at-sea samples, on a log-log scale (note that the empty trawls are shown separately, left of the dashed line). A line with a slope of 1 and intercept of 0 is provided for comparison. The standardization increases the plastics count for almost all samples, mainly because of the adjustment for sampling year. Also, the standardization increases the value of all original zeros counts, to at least 260 km^{-2}.

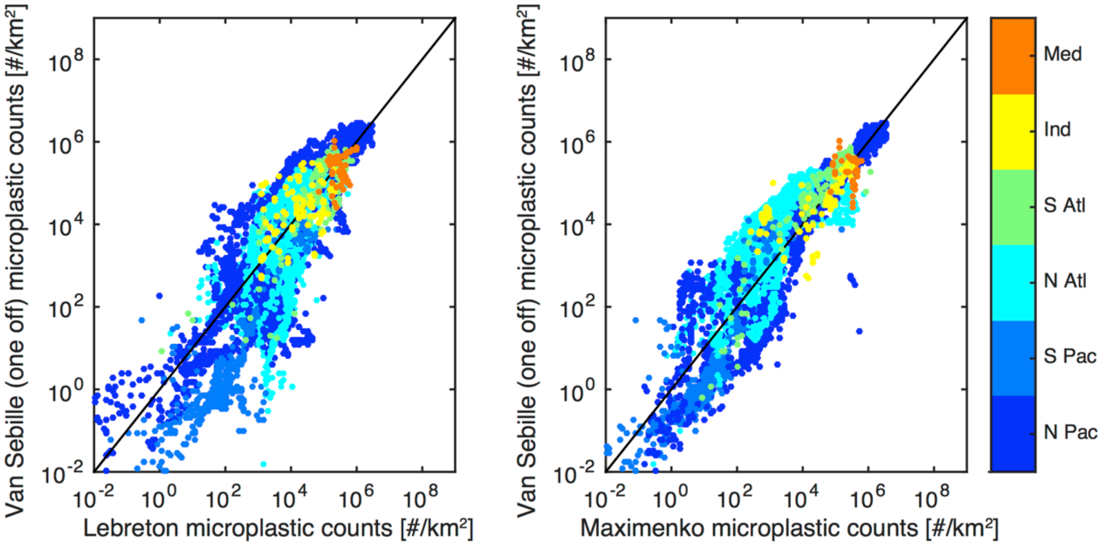

Figure S3: Inter-comparison between the three ocean models at each surface trawl location when the Van Sebille model is run with a one-time sourcing of plastics at the coastline, rather than a continuously increasing input in time. Compared to Figure 2b of the main manuscript, the bias between the Van Sebille model and the other two for low plastic counts has disappeared.

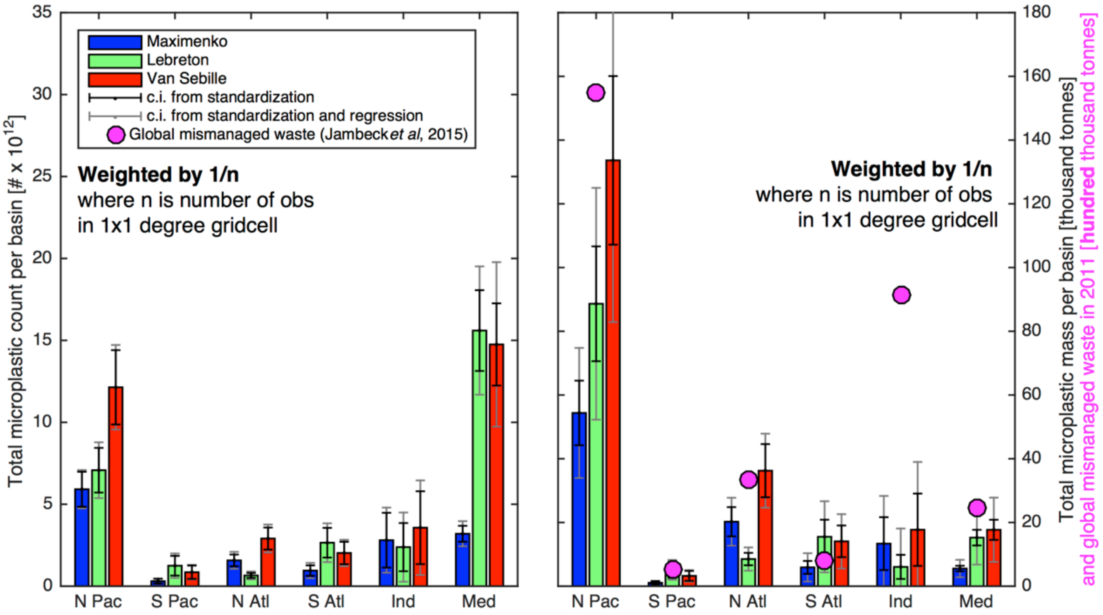

Figure S4: Analysis of the total microplastic count and mass when weighing the individual observations by 1/*n* in the regression analysis, where *n* is the number of observations in each 1° x 1° grid cell. Compared to the solution in Figure 5 of the main manuscript, this solution is less determined by regions where there are hundreds of observations, such as the center of the North Pacific and North Atlantic accumulation zones. In general, the estimates are slightly lower than in the unweighted solution, with the exception of the Maximenko mass estimates.

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