

## Calculations for Harbor Efficiency

Plastic Abundance:  $5114 \text{ g/km}^2 = 5.114 \times 10^{-6} \text{ kg/m}^2$   
<http://www.algalita.org/pdf/1999%20sciencegyre.pdf>

Density of Collected Plastic:  $\approx$  density of seawater  $\Rightarrow 1030 \text{ kg/m}^3$   
[http://www.epa.gov/owow/oceans/debris/plasticpellets/plastic\\_pellets\\_final\\_report.pdf](http://www.epa.gov/owow/oceans/debris/plasticpellets/plastic_pellets_final_report.pdf)

Current Speeds:  
Kuroshio:  $\approx 1.8 \text{ m/s}$   
Everywhere Else:  $\approx 0.4 \text{ m/s}$   
<http://tidesandcurrents.noaa.gov/currents09/tab2pc1.html>

Width of One Harbor: 10 m

Kilograms per ton: 907.2  
<http://www.ookingdom.com/metric/factors>

(Plastic Abundance) x (Width of One Harbor) x (Current Speed) = Collection Rate (kg/s)

### Collection Rate\*:

Kuroshio:	$9.205 \times 10^{-5} \text{ kg/s}$	=	2863 kg/yr*	=	2.779 m <sup>3</sup> /yr
Elsewhere:	$2.046 \times 10^{-5} \text{ kg/s}$	=	636.3 kg/yr	=	0.618 m <sup>3</sup> /yr

### In Four Years:

Kuroshio:	11449	kg	=	11.116	m <sup>3</sup>	=	12.621 U.S. tons
Elsewhere:	2545	kg	=	2.471	m <sup>3</sup>	=	2.805 U.S. tons

\*Numbers are for one harbor, multiply by five for array collection rates

\*Assumes: 30 days = 1 month