

**Table S1. Spearman correlation results of geography, Nitrate concentration and genome metrics from GOS sample sites. Spearman correlation results of genome metrics for the marine microbe data in Table S2.**

<b>GOS Data</b>		<b>Rho</b>	<b>Pval</b>
<b>Type1</b>	<b>Type 2</b>		
Med N ARSC	Distance from land	-0.7334	4.927E-08
Med N ARSC	Nitrate concentration	0.6993	3.658E-07
Med N ARSC	GC%	0.9204	1.694E-17
Distance from land	Nitrate concentration	-0.6297	1.03E-05
Distance from land	GC%	-0.5729	9.046E-05
Distance from land	Median average mass	0.3925	0.0111
GC%	Nitrate concentration	0.6905	5.859E-07
GC%	Median average mass	-0.7486	4.826E-08
Nitrate Concentration	Median average mass	-0.4617	0.0024

  

<b>Marine Microbe Data</b>		<b>Rho</b>	<b>Pval</b>
<b>Type1</b>	<b>Type 2</b>		
Median average mass	Med N ARSC	-0.4873	2.94E-10
Median average mass	GC%	-0.9364	7.05E-86
Median average mass	Med % Arg	-0.8730	1.08E-47
Median average mass	Med % Lys	0.9344	8.81E-68
Med N ARSC	GC%	0.6306	6.79E-18
Med N ARSC	Med % Arg	0.7727	8.09E-31
Med N ARSC	Med % Lys	-0.6396	1.64E-18
GC%	Med % Arg	0.9501	2.84E-76
GC%	Med % Lys	-0.9445	6.28E-73
GC%	Total minimum N	0.3182	7.65E-05
GC%	Total maximim N	0.3213	6.48E-05
Med % Arg	Med % Lys	-0.9352	3.59E-68