

### Appendix 3

Table A3.1. Output logistic regression  $AQF \sim \text{Site} + \text{Spring} + (1 \mid \text{SwanID})$ . Site B, C and D stands for Estonian coast, Gulf of Finland and Dvina Bay, respectively, with Site E (Cheskaya Bay) being the standard. Results visualized in Figure 1 main text.

	Estimate	Std. Error	z value	P
(Intercept)	-0.486	0.360	-1.349	0.177
Site B	1.634	0.475	3.443	<b>0.001</b>
Site C	0.163	0.404	0.404	0.686
Site D	1.153	0.437	2.638	<b>0.008</b>
Spring 2018	0.809	0.376	2.152	<b>0.031</b>
Spring 2019	0.523	0.388	1.348	0.178

Table A3.2. Output logistic regression  $AQF \sim \text{Number} + \text{Spring} + (1 \mid \text{SwanID})$ .  $\geq 1$ ,  $\geq 2$  and  $\geq 3$  stands for at least one, two and three sites, respectively, with  $\geq 4$ , at least four sites, being the standard. Results visualized in Figure 2 main text.

	Estimate	Std. Error	z value	P
(Intercept)	-2.985	0.714	-4.179	<b>0.000</b>
$\geq 1$	6.797	1.293	5.258	<b>0.000</b>
$\geq 2$	4.318	0.798	5.410	<b>0.000</b>
$\geq 3$	2.564	0.622	4.123	<b>0.000</b>
Spring 2018	1.486	0.570	2.609	<b>0.009</b>
Spring 2019	1.068	0.645	1.656	0.098