

Microplastics in bivalves and their habitat in relation to shellfish aquaculture proximity in coastal British Columbia, Canada

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Table S1

A. Effect of site type (aquaculture vs. reference) on MP concentrations in clams

Formula: `glmmadmb(sum ~ site.type + (1 | site/quad) + offset(log(error * tiss.dry.weight)), family = "poisson", link = "log", zeroInflation = TRUE)`

	Coefficient estimate	SE	z value	p
Intercept	-1.521	0.197	-7.95	<0.001
site.type = non-aquaculture	-0.241	0.271	-0.89	0.37

n=170; site=17; site:quad =51

B. Effect of site type (aquaculture vs. reference) on MP concentrations in oysters

Formula: `glmmadmb(sum ~ site.type + (1 | site/quad) + offset(log(error * tiss.dry.weight)), family = "poisson", link = "log", zeroInflation = TRUE)`

	Coefficient estimate	SE	z value	p
Intercept	-3.167	0.151	-20.97	<0.001
site.type = non-aquaculture	-0.114	0.197	-0.58	0.56

n=189; site=19; site:quad=57

C. Effect of region on MP concentrations in clams

Model 1: `sum ~ 1 + offset(log(error * tiss.dry.weight))`

Model 2: `sum ~ region + offset(log(error * tiss.dry.weight))`

Model	Log-likelihood	Difference in degrees of freedom	Deviance	p
1	-266.83			
2	-261.55	5	10.56	0.06

D. Effect of region on MP concentrations in oysters

Model 1: $\text{sum} \sim 1 + \text{offset}(\log(\text{error} * \text{tiss.dry.weight}))$

Model 2: $\text{sum} \sim \text{region} + \text{offset}(\log(\text{error} * \text{tiss.dry.weight}))$

Model	Log-likelihood	Difference in degrees of freedom	Deviance	p
1	-327.27			
2	-322.61	5	9.33	0.10

E. Effect of distance to nearest shellfish aquaculture site on MP concentrations in clams

Formula: $\text{glmmadmb}(\text{sum} \sim \text{aqua_nearest_km} + \text{offset}(\log(\text{error} * \text{tiss.dry.weight})) + (1 | \text{site/quad}), \text{family} = \text{"poisson"}, \text{link} = \text{"log"}, \text{zeroInflation} = \text{TRUE})$

	Coefficient estimate	SE	z value	p
Intercept	-1.570	0.199	-7.87	<0.001
aqua_nearest_km	-0.304	0.699	-0.44	0.66

n=170; site=17; site:quad=51

F. Effect of distance to nearest shellfish aquaculture site on MP concentrations in oysters

Formula: $\text{glmmadmb}(\text{sum} \sim \text{aqua_nearest_km} + \text{offset}(\log(\text{error} * \text{tiss.dry.weight})) + (1 | \text{site/quad}), \text{family} = \text{"poisson"}, \text{link} = \text{"log"}, \text{zeroInflation} = \text{TRUE})$

	Coefficient estimate	SE	z value	p
Intercept	-3.148	0.140	-22.91	<0.001
aqua_nearest_km	-0.491	0.551	-0.89	0.37

n=189; site=19; site:quad=57

G. Effect of site type (aquaculture vs. reference) on MP concentrations in seawater

Formula: $\text{glmmadmb}(\text{sum} \sim \text{site.type} + (1 | \text{site}) + \text{offset}(\log(\text{error})), \text{family} = \text{"poisson"}, \text{zeroInflation} = \text{TRUE})$

	Coefficient estimate	SE	z value	p
Intercept	-0.951	0.309	-3.08	0.002
site.type = non-aquaculture	0.193	0.419	0.46	0.65

n=44; site=16

H. Effect of region on MP concentrations in seawater

Model 1: $\text{sum} \sim 1 + \text{offset}(\log(\text{error}))$ Model 2: $\text{sum} \sim \text{region} + \text{offset}(\log(\text{error}))$

Model	Log-likelihood	Difference in degrees of freedom	Deviance	p
1	-107.13			
2	-103.04	3	8.18	0.04

I. Effect of distance to nearest shellfish farm on MP concentrations in seawater

Formula: $\text{glmmadmb}(\text{sum} \sim \text{aqua_nearest_km} + \text{offset}(\log(\text{error})) + (1 \mid \text{site}), \text{family} = \text{"poisson"}, \text{link} = \text{"log"}, \text{zeroInflation} = \text{TRUE})$

	Coefficient estimate	SE	z value	p
Intercept	-0.639	0.272	-2.35	0.02
aqua_nearest_km	-1.256	1.102	-1.14	0.25

n=44; site=16

J. Effect of MP concentrations in seawater on MP concentrations in clams

Formula: $\text{glmmadmb}(\text{sum} \sim \text{wat.av} + (1 \mid \text{site/quad}) + \text{offset}(\log(\text{error} * \text{tiss.dry.weight})), \text{family} = \text{"poisson"}, \text{link} = \text{"log"}, \text{zeroInflation} = \text{FALSE})$

	Coefficient estimate	SE	z value	p
Intercept	-1.852	0.298	-6.21	<0.001
water.av	-0.095	0.337	-0.28	0.78

n=118; site=12, site:quad=36

K. Effect of MP concentrations in seawater on MP concentrations in oysters

Formula: $\text{glmmadmb}(\text{sum} \sim \text{wat.av} + (\text{wat.av} \mid \text{site/quad}) + \text{offset}(\log(\text{error} * \text{tiss.dry.weight})), \text{family} = \text{"poisson"}, \text{link} = \text{"log"}, \text{zeroInflation} = \text{FALSE})$

	Coefficient estimate	SE	z value	p
Intercept	-5.350	0.321	-16.65	<0.001
water.av	-0.175	0.458	0.38	0.7

n=68; site=10, site:quad=20

L. Effect of site type (aquaculture vs. reference) on MP concentrations in sediment

Formula: $\text{glmmadmb}(\text{formula} = \text{sum} \sim \text{site.type} + (1 \mid \text{site}) + \text{offset}(\log(\text{error})), \text{family} = \text{"poisson"}, \text{zeroInflation} = \text{TRUE})$

	Coefficient estimate	SE	z value	p
Intercept	-0.883	0.182	-4.84	<0.001
site.type = non-aquaculture	-0.132	0.255	-0.52	0.60

n=93; site=16

M. Effect of region on MP concentrations in sediment

Model 1: sum ~ 1 + offset(log(error))

Model 2: sum ~ region + offset(log(error))

Model	Log-likelihood	Difference in degrees of freedom	Deviance	p
1	-220.00			
2	-216.55	3	6.89	0.08

N. Effect of distance to nearest shellfish farm on MP concentrations in sediment

Formula: glmmadmb(sum ~ aqua_nearest_km + offset(log(error)) + (1 | site), family = "poisson", link = "log", zeroInflation = TRUE)

	Coefficient estimate	SE	z value	p
Intercept	-0.843	0.165	-5.12	<0.001
aqua_nearest_km	-0.676	0.690	-0.98	0.33

n=93; site=16

O. Effect of beach slope and sediment grain size on MP concentrations in clams

Formula: glmmadmb(sum ~ beach.slope.deg + PC1 + PC2 + offset(log(error * tiss.dry.weight)) + (1 | site/quad), family = "poisson", link = "log", zeroInflation = TRUE)

	Coefficient estimate	SE	z value	p
Intercept	-1.557	0.220	-7.09	<0.001
beach.slope.deg	-0.023	0.056	-0.42	0.68
PC1	0.114	0.094	1.21	0.23
PC2	0.134	0.136	0.99	0.32

n=148; site=15, site:quad=45

P. Effect of beach slope and sediment grain size on MP concentrations in oysters

Formula: glmmadmb(sum ~ beach.slope.deg + PC1 + PC2 + offset(log(error * tiss.dry.weight)) + (1 | site/quad), family = "poisson", link = "log", zeroInflation = TRUE)

	Coefficient estimate	SE	z value	p
Intercept	-3.315	0.110	-30.15	<0.001
beach.slope.deg	-0.006	0.032	0.20	0.84
PC1	-0.010	0.047	-0.21	0.83
PC2	-0.184	0.066	-2.78	0.01

n=163; site=17, site:quad=50

Q. Effect of beach slope and sediment grain size on MP concentrations in water

Formula: `glmmadmb(sum ~ beach.slope.deg + PC1 + PC2 + offset(log(error)) + (1 | site), family = "poisson", link = "log", zeroInflation = FALSE)`

	Coefficient estimate	SE	z value	p
Intercept	-0.925	0.284	-3.26	0.001
beach.slope.deg	0.038	0.082	0.47	0.64
PC1	-0.158	0.147	-1.07	0.28
PC2	0.085	0.175	0.49	0.63

n=41; site=15

R. Effect of beach slope and sediment grain size on MP concentrations in sediment

Formula: `glmmadmb(sum ~ beach.slope.deg + PC1 + PC2 + offset(log(error)) + (1 | site), family = "poisson", link = "log", zeroInflation = FALSE)`

	Coefficient estimate	SE	z value	p
Intercept	-1.219	0.155	-7.86	<0.001
beach.slope.deg	-0.048	0.044	1.08	0.28
PC1	0.079	0.048	1.66	0.10
PC2	0.009	0.059	-0.15	0.88

n=91; site=16

S. Effect of amount of plastic on site on MP concentrations in clams

Model 1: `sum ~ 1 + offset(log(error * tiss.dry.weight))`

Model 2: `sum ~ plastic + offset(log(error * tiss.dry.weight))`

Model	Log-likelihood	Difference in degrees of freedom	Deviance	p
1	-266.83			
2	-265.15	3	3.37	0.34

T. Effect of amount of plastic on site on MP concentrations in sediment

Model 1: `sum ~ 1 + offset(log(error))`

Model 2: `sum ~ plastic + offset(log(error))`

Model	Log-likelihood	Difference in degrees of freedom	Deviance	p
1	-223.36			
2	-220.51	3	5.70	0.13

U. Effect of amount of plastic on site on MP concentrations in seawater

Model 1: $\text{sum} \sim 1 + \text{offset}(\log(\text{error}))$

Model 2: $\text{sum} \sim \text{plastic} + \text{offset}(\log(\text{error}))$

Model	Log-likelihood	Difference in degrees of freedom	Deviance	p
1	-116.27			
2	-115.21	3	2.13	0.55

V. Effect of amount of plastic on site on MP concentrations in oysters

Model 1: $\text{sum} \sim 1 + \text{offset}(\log(\text{error} * \text{tiss.dry.weight}))$

Model 2: $\text{sum} \sim \text{plastic} + 1 + \text{offset}(\log(\text{error} * \text{tiss.dry.weight}))$

Model	Log-likelihood	Difference in degrees of freedom	Deviance	p
1	-333.96			
2	-324.63	4	18.65	<0.001

W. Model output from Model 2 (from V)

Formula: $\text{glmmadmb}(\text{sum} \sim \text{plastic} + 1 + (1 | \text{site/quad}) + \text{offset}(\log(\text{error} * \text{tiss.dry.weight})), \text{family} = \text{"poisson"}, \text{link} = \text{"log"}, \text{zeroInflation} = \text{TRUE})$

	Coefficient estimate	SE	z value	p
Intercept	-3.640	0.275	-13.25	<0.001
plastic-Low	0.305	0.312	0.98	0.33
plastic-Medium	0.539	0.313	1.72	0.09
plastic-High	0.711	0.337	2.11	0.04

n=189; site=19; site:quad=57
