SUPPLEMENTARY MATERIALS

I. Tables

Table 1S. *Sampling stations around KGI, in Hope Bay and in the Bransfield Strait (Antarctica). The names of the stations are those used during the second leg of the ANTARXXVII campaign.*

Station name	Longitude	Latitude	Location	Depth (m)	Equipment	Date	ICP-MS	FP-XRF
GANT20-01	58°27'00''	62°08'24''	Admiralty Bay	434	Van Veen grab	02-02-20	x	na
GANT20-02	57°00'36''	63°22'48''	Hope Bay	315	Van Veen grab	03-02-20	x	x
GANT20-03	57°00'36''	63°23'24''	Hope Bay	332	Van Veen grab	03-02-20	x	x
GANT20-04	56°58'48''	63°22'48''	Hope Bay	257	Van Veen grab	03-02-20	x	na
GANT20-05	56°57'36''	63°23'24''	Hope Bay	258	Van Veen grab	04-02-20	na	x
GANT20-06	58°30'40''	62°08'60''	Admiralty Bay	210	Van Veen grab	05-02-20	x	x
GANT20-07	58°28'48''	62°08'60''	Admiralty Bay	282	Van Veen grab	05-02-20	x	x
GANT20-08	58°50'24''	62°14'24''	Collins Bay	435	Van Veen grab	06-02-20	x	x
GANT20-09	58°50'24''	62°12'36''	Collins Bay	266	Van Veen grab	07-02-20	x	x
GANT20-10	58°49'48''	62°11'24''	Collins Bay	152	Van Veen grab	07-02-20	x	x
GANT20-11	58°40'48''	62°13'48''	Potter Cove	28	Van Veen grab	11-02-20	x	na
GANT20-15	61°16'48''	63°09'36''	Deception Island	482	Van Veen grab	17-02-20	x	x
GANT20-17	61°36'36''	63°11'24''	Deception Island	476	Van Veen grab	17-02-20	x	na
GANT20-18	61°15'36''	63°05'24''	Deception Island	458	Van Veen grab	17-02-20	x	x
GANT20-19	61°12'00''	63°04'48''	Deception Island	597	Van Veen grab	17-02-20	x	na
GANT20-20	61°12'00''	63°03'36''	Deception Island	429	Van Veen grab	18-02-20	x	x
GANT20-21	60°59'24''	63°00'00''	Deception Island	321	Van Veen grab	18-02-20	x	x
GANT20-22	60°53'24''	62°58'48''	Deception Island	298	Van Veen grab	18-02-20	x	na
RD 2	60°53'84''	63°28'63''	Deception Island	395	Rock dredge	18-02-20	x	na
GANT20-23	59°43'48''	62°54'36''	Little Point	936	Van Veen grab	18-02-20	x	x
GANT20-24	59°47'24''	62°52'48''	Little Point	673	Van Veen grab	19-02-20	x	x
GANT20-25	59°55'12''	62°52'12''	Little Point	468	Van Veen grab	19-02-20	na	x
GANT20-26	60°02'60''	62°53'60''	Little Point	938	Van Veen grab	19-02-20	x	x
GANT20-27	59°53'60''	62°49'12''	Little Point	675	Van Veen grab	19-02-20	x	x
GANT20-28	59°50'24''	62°51'00''	Little Point	542	Van Veen grab	19-02-20	x	x
GANT20-29	59°48'36''	62°49'48''	Little Point	602	Van Veen grab	21-02-20	na	x
GANT20-30	59°45'00''	62°50'24''	Little Point	904	Van Veen grab	21-02-20	x	x
RD 6	58°22'05''	62°26'09''	Orca	736	Rock dredge	25-02-20	x	na
RD 7	58°21'34''	62°30'72''	Orca	1316	Rock dredge	25-02-20	x	na
GANT20-31	58°16'82''	62°23'32''	Orca	1358	Van Veen grab	26-02-20	x	na
RAUSCHERT 3	58°17'03''	62°15'06''	Orca	663	Rauschert dredge	26-02-20	x	na

Table 2S. *Concentrations of trace elements (µg/g) in surface sediments for each station around King George Island, in Hope Bay and in the Bransfield Strait (Antarctica) measured by ICP-MS. The combined precision (±1sd) was estimated by analysing duplicate test samples in 7 successive runs as explained in Table 1. Underlined values were considered as outliers.*

µg/g	Al	As	Cd	Cd	Cr	Cu	Fe	Hg	Mn	Ni	Pb	V	Zn
Gant20-01	62104	8	0.28	19	40	69	33378	0.031	918	19	9	206	90
	±3568	±1	±0.04	±1	±2	±5	±1376	±0.004	±54	±1	±0.4	±8	±6
Gant20-02	54857	5	0.16	10	40	12	21328	0.039	523	23	8	118	45
	±3152	±1	±0.02	±1	±2	±1	±879	±0.005	±30	±1	±0.4	±5	±3
Gant20-03	53202	6	0.12	10	36	11	21203	0.016	522	20	8	122	43
	±3056	±1	±0.02	±1	±1	±1	±874	±0.002	±30	±1	±0.4	±5	±3
Gant20-04	56986	5	0.16	17	76	18	26649	0.021	654	42	9	150	64
	±3274	±1	±0.02	±1	±3	±1	±1099	±0.002	±38	±3	±0.4	±6	±4
Gant20-06	56606	12	0.35	19	32	81	35,317	0.278	951	15	10	206	89
	±3252	±1	±0.06	±1	±1	±6	±1456	±0.033	±55	±1	±0.5	±8	±6
Gant20-07	61973	9	0.27	19	31	80	32892	0.022	919	15	9	207	84
	±3560	±1	±0.04	±1	±1	±6	±1356	±0.003	±54	±1	±0.4	±9	±6
Gant20-08	34214	5	0.20	26	22	41	39057	0.016	1234	15	8	258	90
	±1965	±1	±0.03	±1	±1	±3	±1610	±0.002	±72	±1	±0.4	±11	±6
Gant20-09	51373	8	0.27	29	36	51	48372	0.035	2118	21	10	299	115
	±2951	±1	±0.04	±2	±1	±4	±1994	±0.004	±123	±1	±0.5	±12	±8
Gant20-10	50701	11	0.42	20	25	78	35459	0.037	879	14	10	217	89
	±2913	±1	±0.06	±1	±1	±1	±1462	±0.004	±51	±1	±0.5	±9	±6
Gant20-11	59822	9	0.21	17	17	81	31006	0.014	903	9	7	195	74
	±3437	±1	±0.03	±1	±1	±6	±1278	±0.002	±53	±1	±0.3	±8	±5
Gant20-15	46583	3	0.20	20	58	35	33369	0.035	1004	25	6	203	84
	±2676	±0.4	±0.03	±1	±2	±2	±1376	±0.004	±59	±2	±0.3	±8	±6
Gant20-17	45730	4	0.22	18	61	30	32782	0.029	1000	24	6	198	77
	±2627	±0.5	±0.03	±1	±3	±2	±1352	±0.003	±58	±1	±0.3	±8	±5
Gant20-18	31279	5	0.19	29	59	39	36393	0.019	1273	28	6	242	80
	±1797	±0.6	±0.03	±2	±2	±3	±1501	±0.002	±74	±2	±0.3	±10	±5
Gant20-19	47083	4	0.15	20	62	37	34156	0.040	1089	26	7	195	90
	±2705	±0.5	±0.02	±1	±3	±3	±1408	±0.005	±63	±2	±0.3	±8	±6
Gant20-20	32555	3	0.17	22	44	37	34180	0.021	1238	21	7	226	87
	±1870	±0.4	±0.03	±1	±2	±3	1409	±0.002	±72	±1	±0.3	±9	±6
Gant20-21	36473	5	0.17	27	77	40	33877	0.017	1046	49	6	210	82
	±2095	±0.6	±0.03	±2	±3	±3	±1397	±0.002	±61	±3	±0.3	±9	±5
Gant20-22	34785	17	0.22	25	34	38	37886	0.020	1106	16	5	238	80
	±1998	±2.0	±0.03	±1	±1	±3	±1562	±0.002	±64	±1	±0.2	±10	±5
Gant20-23	48348	6	0.28	14	44	40	29088	0.059	652	20	11	157	97
	±2777	±0.7	±0.04	±1	±2	±3	±1199	±0.007	±38	±1	±0.5	±6	±6
Gant20-24	41873	4	0.18	17	37	40	31321	0.034	796	17	8	186	92
	±2405	±0.5	±0.03	±1	±2	±3	±1291	±0.004	±46	±1	±0.4	±8	±6
Gant20-26	36735	5	0.19	28	27	43	41090	0.020	1280	16	8	274	94
	±2110	±0.6	±0.03	±2	±1	±3	±1694	±0.002	±75	±1	±0.4	±11	±6
Gant20-27	43980	8	0.24	17	26	64	29476	0.034	776	13	7	183	75
	±2526	±0.9	±0.04	±1	±1	±5	±1215	±0.004	±45	±1	±0.3	±8	±5
Gant20-28	45509	11	0.25	19	39	66	33752	0.025	898	17	8	209	86
	±2614	±1.3	±0.04	±1	±2	±5	±1392	±0.003	±52	±1	±0.4	±9	±6
Gant20-30	37149	4	0.19	25	24	38	38788	0.016	1158	12	7	260	88
	±2134	±0.5	±0.03	±1	±1	±3	±1599	±0.002	±68	±1	±0.3	±11	±6
Gant20-31	49019	6	0.19	20	40	44	36477	0.053	1025	19	14	220	102
	±2816	±0.7	±0.03	±1	±2	±3	±1504	±0.006	±60	±1	±0.7	±9	±7
RAUSCHERT 3	47620	5	0.23	19	46	52	31657	0.025	911	19	8	206	83
	±2736	±0.6	±0.04	±1	±2	±4	±1305	±0.003	±53	±1	±0.4	±8	±6
RD 2	32094	9	0.25	23	28	29	31301	0.075	989	14	6	218	73
	±1844	±1.1	±0.04	±1	±1	±2	±1291	±0.009	±58	±1	±0.3	±9	±5
RD 6	38191	4	0.23	22	34	46	39229	0.034	1146	16	7	218	101
	±2194	±0.5	±0.04	±1	±1	±3	±1617	±0.004	±67	±1	±0.3	±9	±7
RD 7	45891	6	0.20	16	43	46	31322	0.074	795	19	10	181	97
	±2636	±0.7	±0.03	±1	±2	±3	±1291	±0.009	±46	±1	±0.5	±7	±6

***Table 3S**. Concentrations of trace elements (µg/g) in surface sediments for each station around King George Island, in Hope Bay and in the Bransfield Strait (Antarctica) measured by FP-XRF.*

µg/g	As	Ca	Co	Cr	Cu	Fe	Mo	Mn	Nb	Ni	Pb	Rb	Sb	Sn	Sr	Th	Ti	Y	Zn	Zr
Gant20-02	6	10197	10	23	-	23418	29	316	6	10	8	62	5	2	238	6	2249	23	85	122
Gant20-03	7	10737	8	13	2	20671	34	306	6	9	8	60	6	3	246	6	2413	18	105	129
Gant20-04	6	9944	13	23	-	26711	34	343	5	16	9	56	5	2	209	5	2675	22	87	108
Gant20-05	6	9825	10	24	-	24693	29	329	5	12	8	65	7	3	216	6	2369	21	83	86
Gant20-06	7	13123	15	8	28	34048	32	520	4	4	9	37	5	2	226	4	2678	24	109	82
Gant20-07	6	13825	13	17	25	33294	36	508	4	3	9	30	5	2	294	4	2845	22	103	72
Gant20-08	7	15389	14	19	21	35402	34	512	4	6	9	30	5	2	234	4	3211	25	91	71
Gant20-09	7	12617	23	7	27	37124	42	501	3	-	8	30	5	2	205	3	2792	24	110	65
Gant20-10	7	11081	15	15	25	32752	46	462	3	5	8	29	5	2	175	4	2610	23	97	59
Gant20-15	8	19130	19	11	13	38886	25	636	4	9	8	25	5	2	218	3	3655	28	132	90
Gant20-18	7	13972	16	-	6	36172	34	555	4	6	8	20	7	3	218	3	3192	24	110	73
Gant20-20	9	16086	13	-	5	28571	27	798	2	2	14	21	6	3	263	3	2937	25	106	79
Gant20-21	7	15583	17	8	12	38238	32	566	3	7	8	22	6	3	228	3	3413	25	113	75
Gant20-23	7	8778	10	5	-	24809	47	332	4	3	8	34	5	3	125	4	2363	25	101	72
Gant20-24	8	15753	18	-	13	39316	25	531	4	3	8	21	5	2	215	3	4205	28	133	97
Gant20-25	8	17584	22	-	13	40116	38	596	3	-	8	17	6	3	215	3	4174	27	115	94
Gant20-26	7	9045	11	5	4	27113	49	350	4	1	9	32	6	3	129	4	2485	23	90	70
Gant20-27	8	18881	21	-	16	41914	29	612	3	-	7	18	5	3	226	3	4406	28	127	100
Gant20-28	8	15775	17	-	16	38208	30	539	4	3	8	21	5	3	210	3	4067	27	121	98
Gant20-29	9	11892	23	42	41	38645	23	549	9	14	7	31	6	2	257	5	2872	33	159	131
Gant20-30	8	10823	18	4	7	35715	30 ±	499	3	5	8	23	6	3	198	3	2946	28	117	90

Table 4S. *p-values for ANOVA, Kruskal-Wallis, Tukey and Dunn's tests for differences in trace element concentrations (ICP-MS) around KGI, in Hope Bay and in the Bransfield Strait (Antarctica). Significant differences are indicated by bold numbers and non-normally distributed elements are indicated by a *.*

	Al	As*	Cd*	Co	Cr*	Cu*	Fe	Hg*	Mn*	Ni	Pb	V	Zn*
ANOVA/ Kruskal-Wallis	**≤ 0.001**	0.27	**0.01**	**0.02**	**0.03**	**≤ 0.001**	**≤ 0.01**	0.69	**0.05**	**0.02**	**0.01**	**≤ 0.01**	**0.02**
Tukey/Dunn													
Admiralty Bay - Collins Bay	0.07	na	0.59	0.51	0.46	0.37	0.31	na	0.30	1.00	1.00	0.35	0.37
Admiralty Bay - Deception Island	**≤ 0.001**	na	**0.01**	0.76	0.10	**≤ 0.001**	1.00	na	0.22	0.20	0.06	1.00	0.36
Collins Bay - Deception Island	0.57	na	0.07	0.98	**0.01**	**0.03**	0.18	na	0.98	0.30	0.08	0.38	**0.05**
Admiralty Bay - Hope Bay	0.93	na	**≤ 0.001**	0.36	0.30	**≤ 0.001**	**0.03**	na	0.11	0.59	1.00	**0.05**	**0.04**
Collins Bay - Hope Bay	0.45	na	**0.01**	**0.01**	0.07	**0.01**	**≤ 0.001**	na	**0.01**	0.72	1.00	**≤ 0.001**	**≤ 0.01**
Deception Island - Hope Bay	**0.01**	na	0.13	**0.01**	0.70	0.29	**0.01**	na	**≤ 0.001**	1.00	0.23	**≤ 0.01**	0.11
Admiralty Bay - Little Point	**0.00**	na	0.11	1.00	0.91	0.09	1.00	na	0.91	1.00	0.98	1.00	0.80
Collins Bay - Little Point	0.99	na	0.34	0.51	0.46	0.51	0.18	na	0.19	1.00	0.99	0.31	0.44
Deception Island - Little Point	0.87	na	0.29	0.76	**0.03**	0.06	1.00	na	0.09	**0.04**	0.11	1.00	0.14
Hope Bay - Little Point	0.07	na	**0.02**	0.13	0.19	**0.01**	**0.01**	na	0.09	0.36	1.00	**0.01**	**0.01**
Admiralty Bay - Orca	**0.04**	na	0.12	1.00	0.35	0.25	1.00	na	0.84	0.98	1.00	1.00	0.32
Collins Bay - Orca	1.00	na	0.33	0.50	0.08	0.84	0.37	na	0.36	1.00	1.00	0.28	0.97
Deception Island - Orca	0.50	na	0.41	0.75	0.52	**0.03**	1.00	na	0.26	0.56	**0.01**	1.00	**0.02**
Hope Bay - Orca	0.34	na	**0.05**	0.24	0.86	**0.01**	**0.01**	na	0.06	0.93	0.97	**0.03**	**≤ 0.001**
Little Point - Orca	0.99	na	0.92	1.00	0.22	0.63	1.00	na	0.72	0.92	0.88	1.00	0.37
Admiralty Bay - Potter Cove	1.00	na	0.29	1.00	0.28	0.92	0.99	na	0.75	0.51	0.90	1.00	0.25
Collins Bay - Potter Cove	0.38	na	0.50	0.56	0.57	0.46	0.32	na	0.29	0.42	0.93	0.52	0.07
Deception Island - Potter Cove	**0.03**	na	0.65	0.76	**0.03**	**0.03**	0.98	na	0.26	**0.02**	0.99	0.99	0.50
Hope Bay - Potter Cove	0.99	na	0.19	0.94	0.07	**0.01**	0.57	na	0.42	0.06	0.99	0.48	0.75
Little Point - Potter Cove	0.13	na	0.93	0.99	0.28	0.22	0.99	na	0.79	0.48	0.99	1.00	0.16
Orca - Potter Cove	0.33	na	0.98	1.00	0.08	0.37	0.98	na	0.64	0.21	0.81	1.00	0.06

***Table 5S**. Enrichment Factor in surface sediments (green: deficiency to minimal enrichment; light yellow: moderate enrichment; yellow: significant enrichment), Geo-accumulation index (green: uncontaminated; light green: uncontaminated to moderately contaminated; light yellow: moderately contaminated; yellow: moderately to heavily contaminated) and Ecological Risk Index (RI) (green: low ecological risk; light yellow: moderate ecological risk) for stations around KGI, in Hope Bay and in the Bransfield Strait (Antarctica).*

	Enrichment Factor								Geo-accumulation Index								RI
	As	Cd	Hg	Cu	Zn	Pb	Cr	Ni	As	Cd	Hg	Cu	Zn	Pb	Cr	Ni	
GANT20-01	5.03	3.41	0.68	6.01	0.64	0.64	1.44	1.24	1.43	0.87	-1.46	1.68	0.20	-1.54	-0.38	-0.59	179.9
GANT20-02	3.57	2.17	0.99	1.14	1.21	0.69	1.62	1.71	0.75	0.04	-1.10	-0.89	-0.81	-1.61	-0.39	-0.31	115.1
GANT20-03	4.05	1.65	0.41	1.16	1.21	0.71	1.48	1.59	0.89	-0.40	-2.42	-0.91	-0.85	-1.63	-0.56	-0.46	87.8
GANT20-04	3.60	2.11	0.52	1.72	1.69	0.73	2.94	3.07	0.82	0.05	-1.98	-0.25	-0.27	-1.49	0.53	0.59	114.0
GANT20-06	8.35	4.75	0.65	7.76	2.33	0.83	1.26	1.12	2.03	1.21	-1.66	1.92	0.18	-1.31	-0.71	-0.87	223.2
GANT20-07	5.43	3.25	0.48	6.96	2.01	0.64	1.11	0.99	1.53	0.79	-1.96	1.89	0.10	-1.54	-0.76	-0.93	174.6
GANT20-08	5.24	4.32	0.63	6.43	3.92	1.03	1.45	1.80	0.63	0.35	-2.42	0.92	0.21	-1.72	-1.23	-0.91	115.1
GANT20-09	5.81	3.98	0.94	5.38	3.35	0.88	1.56	1.71	1.36	0.82	-1.26	1.25	0.57	-1.37	-0.53	-0.40	173.4
GANT20-10	8.26	6.25	1.01	8.32	2.63	0.87	1.11	1.18	1.85	1.45	-1.18	1.86	0.20	-1.40	-1.05	-0.96	240.4
GANT20-11	5.72	2.61	0.32	7.32	1.84	0.56	0.65	0.59	1.56	0.43	-2.61	1.91	-0.08	-1.79	-1.59	-1.71	149.7
GANT20-15	2.62	3.22	1.03	4.10	2.68	0.62	2.78	2.23	0.07	0.37	-1.28	0.72	0.10	-2.01	0.16	-0.16	124.5
GANT20-17	3.03	3.57	0.88	3.56	2.52	0.60	2.94	2.15	0.25	0.49	-1.52	0.49	-0.01	-2.07	0.21	-0.24	125.7
GANT20-18	6.32	4.50	0.84	6.68	3.81	0.86	4.16	3.73	0.77	0.28	-2.14	0.85	0.04	-2.11	0.16	0.01	121.4
GANT20-19	3.38	2.37	1.19	4.29	2.85	0.71	2.93	2.34	0.46	-0.06	-1.05	0.80	0.21	-1.81	0.25	-0.08	120.4
GANT20-20	4.12	4.06	0.87	6.18	3.96	0.96	3.02	2.63	0.21	0.19	-2.03	0.79	0.15	-1.89	-0.24	-0.44	108.0
GANT20-21	5.15	3.44	0.63	5.91	3.34	0.77	4.69	5.59	0.69	0.11	-2.35	0.89	0.07	-2.04	0.56	0.81	119.5
GANT20-22	19.25	4.86	0.80	5.85	3.43	0.72	2.19	1.93	2.53	0.54	-2.05	0.81	0.04	-2.22	-0.61	-0.79	189.0
GANT20-23	5.03	4.46	1.70	4.45	2.98	1.01	2.04	1.75	1.07	0.89	-0.50	0.89	0.31	-1.24	-0.24	-0.46	184.3
GANT20-24	3.40	3.21	1.13	5.16	3.26	0.89	1.97	1.65	0.30	0.21	-1.30	0.89	0.23	-1.64	-0.49	-0.75	119.6
GANT20-26	5.07	3.86	0.74	6.37	3.82	1.03	1.63	1.78	0.68	0.29	-2.10	1.01	0.27	-1.61	-0.95	-0.83	118.1
GANT20-27	6.80	4.12	1.07	7.84	2.54	0.77	1.31	1.21	1.36	0.64	-1.30	1.57	-0.06	-1.78	-1.01	-1.13	163.9
GANT20-28	9.53	4.22	0.76	7.85	2.80	0.85	1.90	1.57	1.90	0.73	-1.75	1.62	0.13	-1.59	-0.43	-0.70	182.3
GANT20-30	4.66	3.90	0.60	5.59	3.53	0.90	1.44	1.40	0.57	0.32	-2.38	0.84	0.18	-1.80	-1.12	-1.16	111.9
GANT20-31	4.54	2.91	1.50	4.90	3.10	1.26	1.82	1.60	0.94	0.29	-0.66	1.05	0.39	-0.91	-0.38	-0.57	150.7
RAUSCHERT 3	4.15	3.60	0.74	5.94	2.58	0.74	2.12	1.63	0.77	0.56	-1.72	1.28	0.08	-1.72	-0.20	-0.58	139.9
RD 2	11.00	5.98	3.25	4.86	3.39	0.86	1.92	1.84	1.60	0.72	-0.15	0.43	-0.10	-2.08	-0.91	-0.98	192.5
RD 6	4.38	4.50	1.22	6.53	3.94	0.84	1.94	1.80	0.53	0.57	-1.31	1.10	0.37	-1.85	-0.65	-0.76	138.8
RD 7	5.37	3.32	2.22	5.42	3.16	0.96	2.08	1.74	1.09	0.39	-0.19	1.10	0.32	-1.39	-0.28	-0.54	171.9

II. Figures

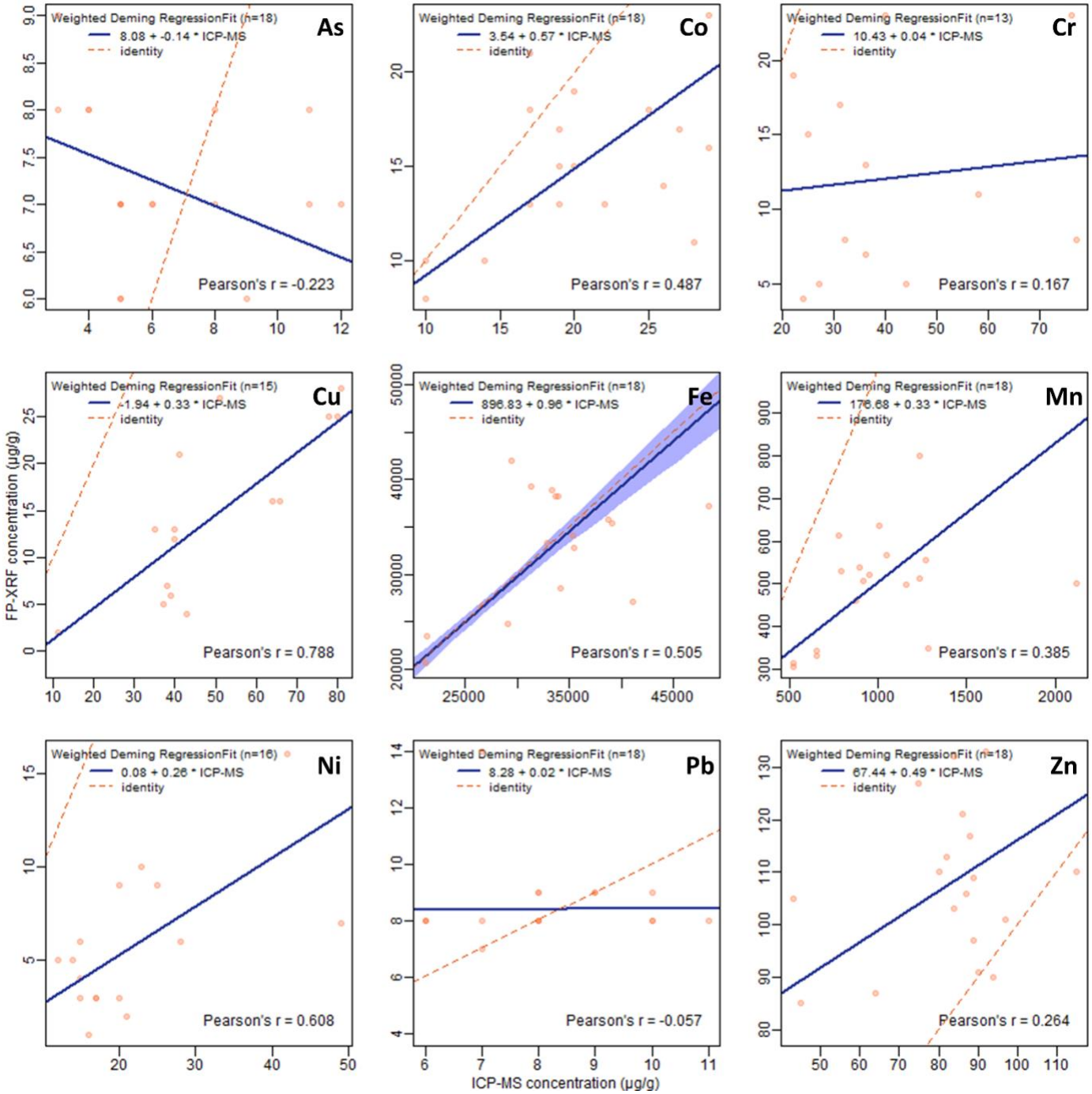

Figure 1S. *Weighted Deming regressions of the concentrations (µg/g) of As, Co, Cr, Cu, Fe, Mn, Ni, Pb and Zn measured by FP-XRF and ICP-MS. P-values are: As = 0.373, Co = 0.041, Cr = 0.741, Cu = 0.000, Fe = 0.032, Mn = 0.115, Ni = 0.012, Pb = 0.823, Zn = 0.289.*

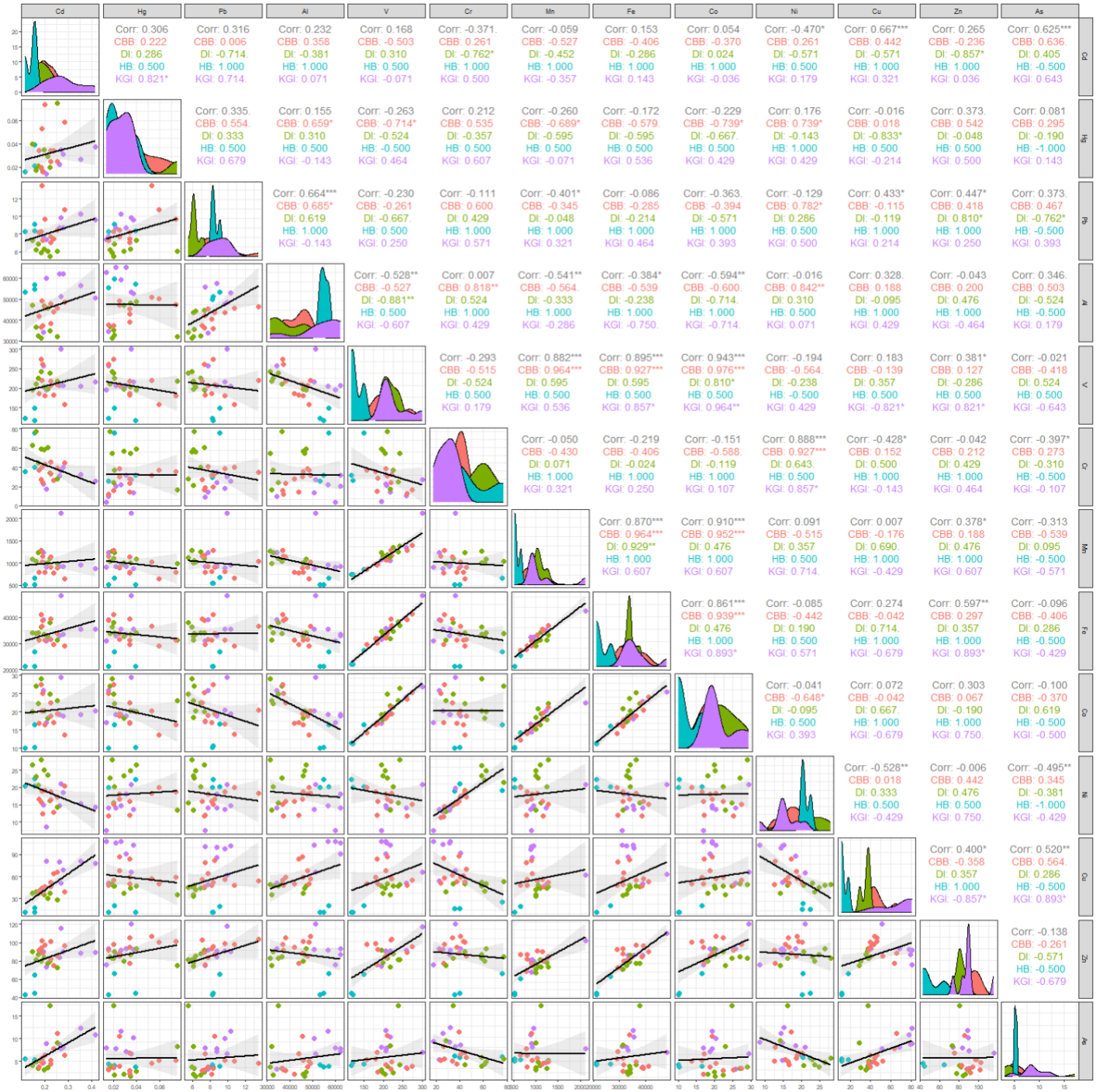

Figure 2S. *Pairwise regressions (lower triangle) and Spearman rank values (upper triangle) of trace elements (ICP-MS) at sampling stations calculated over the entire study area and by geochemically distinct region. DI = Deception Island, HB = Hope Bay, KGI = King George Island, CBB = Central Bransfield Basin (including Orca and Little Point). Stars indicate significant values.*

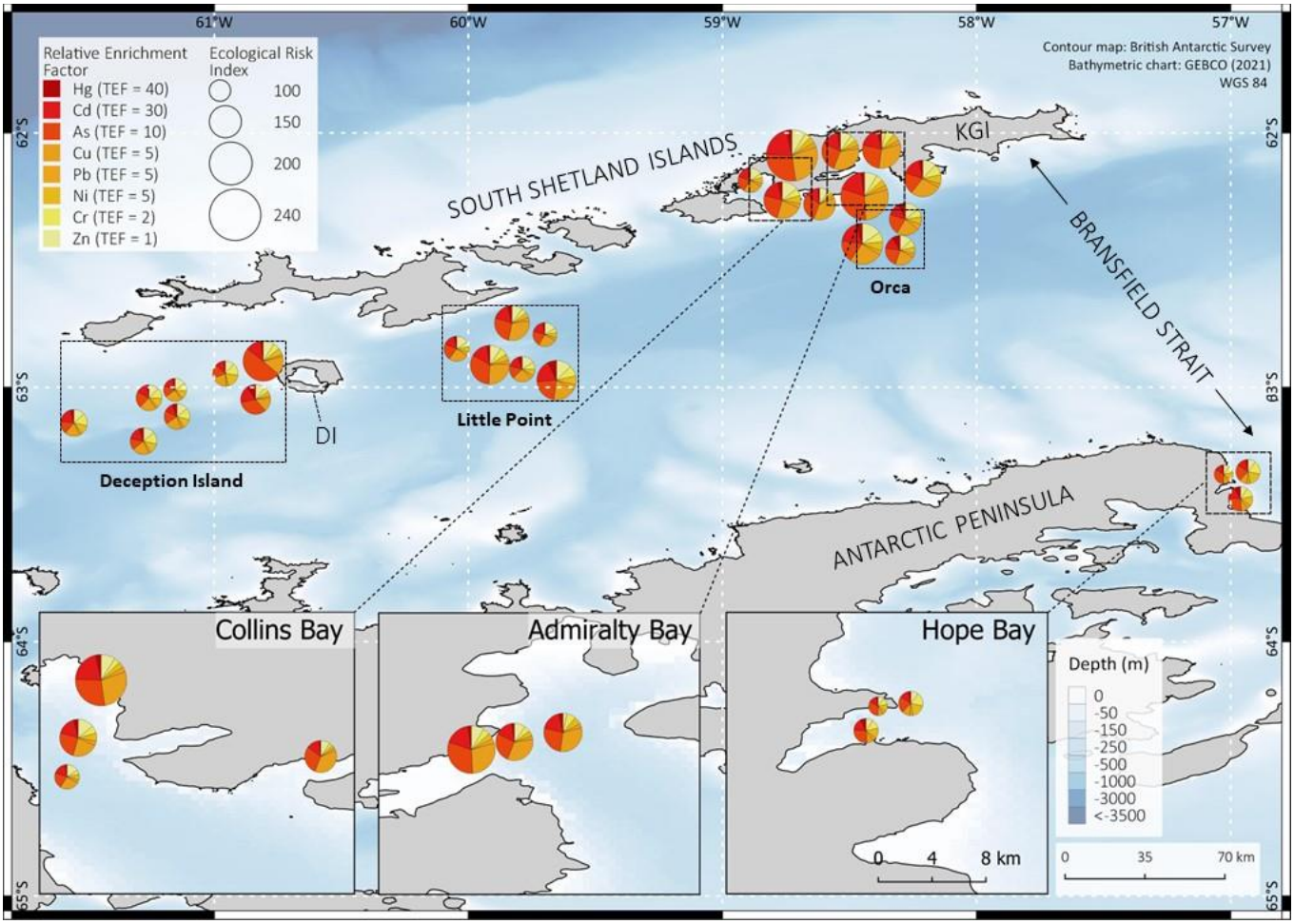

***Figure 3S**. Relative importance of the enrichment factors (for Hg, Cd, As, Cu, Pb, Cr and Zn) in surface sediments at each sampling station around King George Island, in Hope Bay and in the Bransfield Strait (Antarctica). The gradient of colours reflects the toxicity of the elements based on the TEF (Toxicity Equivalency Factor; from light yellow – least toxic (TEF = 1) to dark red – more toxic (TEF = 40)) and the size of the pie chart is proportional to the value of the Ecological Risk Index. KGI = King George Island, DI = Deception Island.*