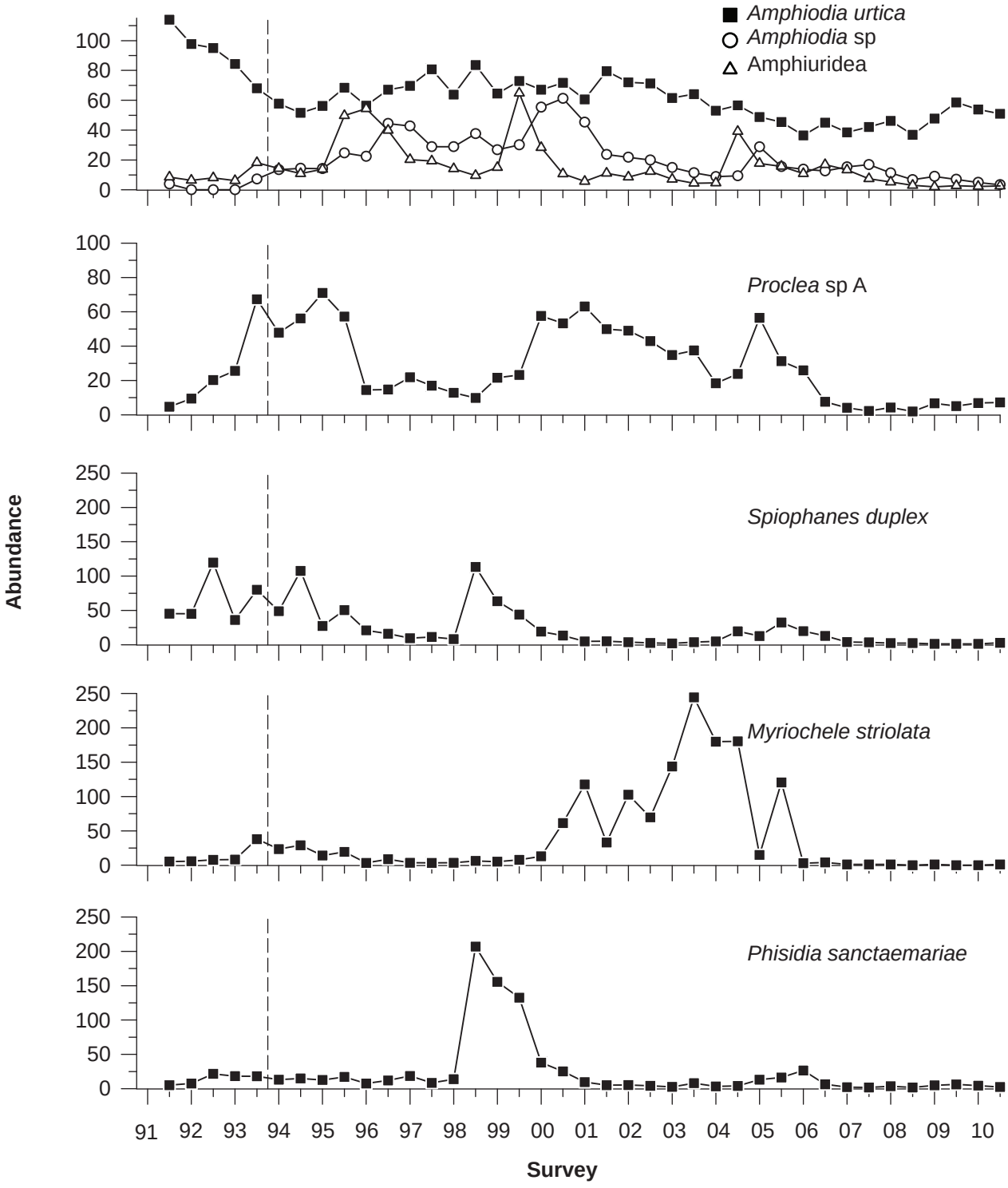
Appendix D

Supporting Data

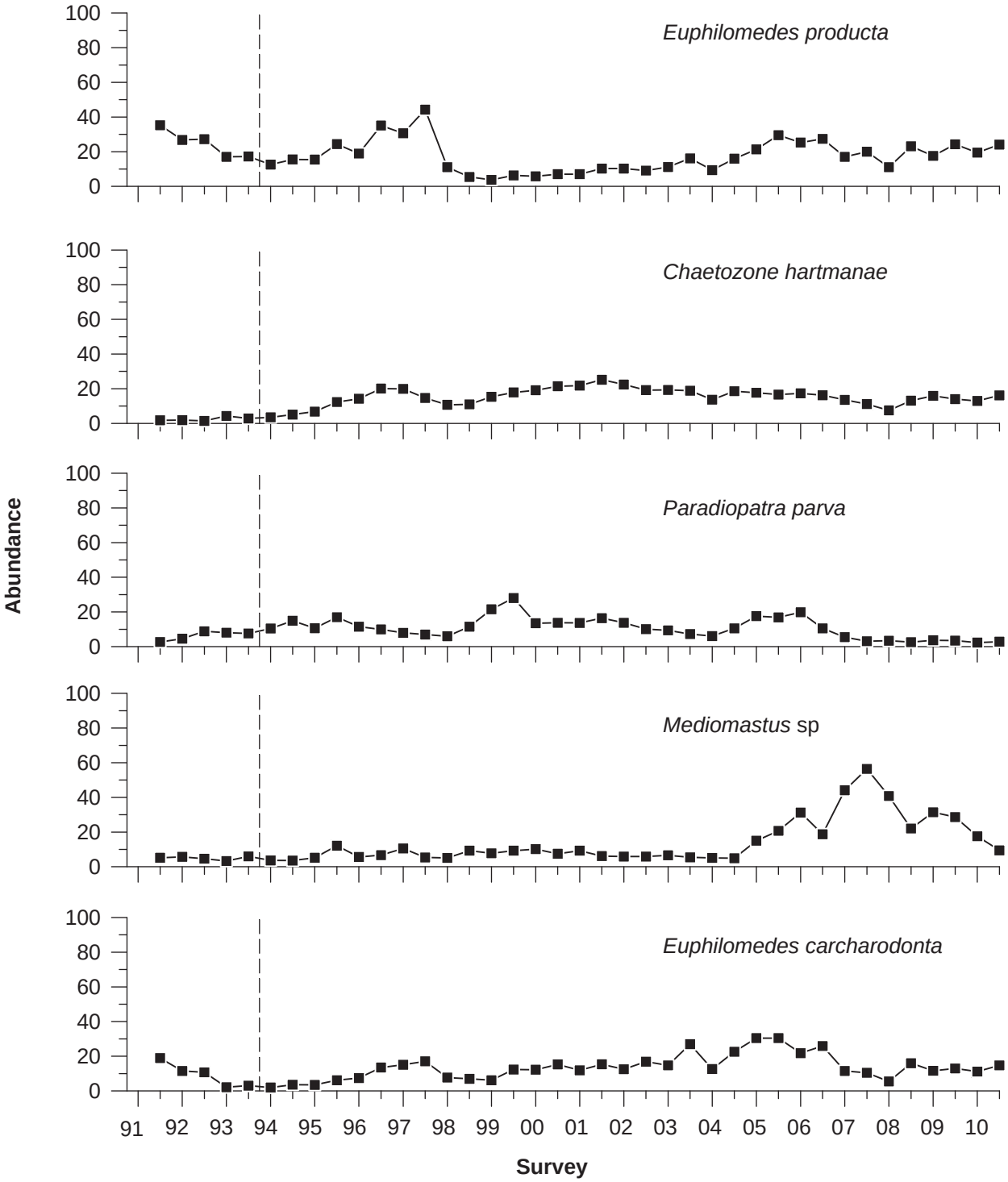
2010 PLOO Stations

Macrobenthic Communities



Appendix D.1

Abundance per survey for each of the 10 most abundant species (taxa) at PLOO benthic stations sampled between 1991 and 2010. Species listed in order of decreasing abundance. *Amphiodia urtica* and unidentifiable juveniles (*Amphiodia* sp and Amphiuridea) graphed together; note expanded scale for *Spiophanes duplex*, *Myriochele striolata*, and *Phisidia sanctaemariae*. Data are expressed as mean values of biannual (i.e., first and third quarters) samples during each survey ($n = 22$); sampling was limited to primary core stations ($n = 12$) during the quarters 03-3, 04-3, 05-1, 08-3, and 09-1 due to regulatory relief to accommodate special projects. Dashed lines indicate onset of discharge from the PLOO.



Appendix D.1 *continued*

Appendix D.2

Abundance (# individuals/0.1-m^2) of common organisms within groups defined by cluster analysis (Figure 5.4). Data are expressed as means ± SE. Colored boxes provide partial explanation of SIMPROF support for each clade. Gray shaded boxes show abundances of select invertebrates that occurred ubiquitously across the PLOO sampling region. Blue shaded boxes indicate the absence of many common taxa from one grab at site E21 in January (cluster group E). Pink boxes indicate high abundances of select organisms at deep sites B12, E3, and E9 (cluster group D). Yellow boxes highlight select species whose abundances at the PLOO (site E14) site differed from other survey sites (cluster group A). Green boxes show high populations of the ophiuroid *Amphiodia urtica* at mid-depth sites.

	E14 Jan (1 grab), Jul	B10 Jul	B11	B10 Jan	B9	E9 Jul	E2	E14 Jan (1 grab)	E5, E7, E8, E11, E15, E17, E19, E20, E23, E25, E26, E21 Jan (1 grab), Jul	B8	E1	E21 Jan (1 grab)	B12	E3 Jul	E3 Jan, E9 Jan
Cluster Group	**A**	**B**	**C**	**F**	**F**	**F**	**F**	**F**	**F**	**G**	**G**	**E**	**D**	**D**	**D**
Number of Grabs	3	2	4	2	4	2	4	1	47	4	4	1	4	2	4
Annelida (Polychaeta)															
Aphelochaeta glandaria Cmplx	18.33 (9.96)	28.5 (0.5)	1.75 (1.03)	10 (4)	1.5 (0.29)	2 (1)	1 (1)	4	7.04 (0.79)	0.75 (0.48)	1.25 (0.48)	3	3 (1.08)	6 (1)	6 (1.15)
Aphelochaeta sp LA1	2 (0.58)	6 (2)	8.5 (2.10)	5.5 (1.5)	2 (1.68)	3.5 (1.5)	7.75 (2.25)	1	2.34 (0.40)	0.25 (0.25)	2.75 (0.63)	1	4.5 (2.22)	5 (1)	5 (1.83)
Aricidea (*Acmira*) *catherinae*	3 (0.58)	2.5 (2.5)	1.75 (1.03)	13.5 (2.5)	6.5 (1.5)	39.5 (18.5)	12.5 (3.77)	36	8.53 (1.19)	0.25 (0.25)	2 (0.41)	1	8 (4.71)	5 (1)	2 (1.35)
Chaetozone hartmanae	13 (3.21	5.5 (1.5)	14.25 (2.10)	8.5 (5.5)	14.5 (2.60)	8.5 (2.5)	7 (1.22)	15	7.60 (0.84)	1 (0.41)	1 (0.71)	4	2 (0.71)	1 (0)	2 (1.22)
Lumbrineris sp Group I	2 (0.58)	1 (0)	0.25 (0.25)	0.5 (0.5)	4 (1)	10.5 (0.5)	12.25 (2.25)	9	5.68 (0.83)	1 (0.58)	3.5 (1.44)	7	0.25 (0.25)	2.5 (2.5)	1.75 (0.85)
Lysippe sp A	2.67 (1.45)	0.5 (0.5)	3.25 (1.31)	3 (2)	3.5 (0.96)	18.5 (3.5)	6.5 (1.55)	5	4.79 (0.50)	1.75 (1.03)	2.75 (0.75)	7	7 (3.19	14.5 (4.5)	6.5 (0.87)
Prionospio (*Prionospio*) *jubata*	1.33 (0.88)	6.5 (0.5)	2.25 (0.63)	1.5 (0.5)	1.5 (0.65)	1.5 (0.5)	2.25 (1.03)	2	2.98 (0.32)	7 (6.04)	0.75 (0.75)	3	3.75 (2.14)	3 (2)	3.25 (0.85)
Sternaspis fossor	1 (0.58)	3 (1)	4 (1.91)	8.5 (2.5)	2.5 (0.87)	3 (0)	2 (0.41)	6	5.36 (0.41)	3.5 (1.55)	4 (1.08)	6	0.75 (0.48)	1 (0)	3 (0.82)
Arthropoda															
Caecognathia crenulatifrons	2 (1.15)	4 (2)	1.5 (0.65)	6 (3)	5 (1.47)	2 (0)	1.25 (0.75)	5	4.32 (0.56)	1 (0.41)	1 (0.41)	1	4.5 (0.5)	4 (2)	0.75 (0.25)
Annelida (Polychaeta)															
Aphelochaeta monilaris	10 (1.53)	11.5 (1.5)	2.25 (0.25)	22.5 (1.5)	1.5 (0.65)	3 (2)	3 (1.35)	2 (2)	2.87 (0.42)	0.75 (0.48)	1.5 (0.65)	0	1.25 (0.25)	2.5 (1.5)	0.5 (0.29)
Clymenura gracilis	2 (1.15)	0.5 (0.5)	3 (0.71)	1 (1)	3.5 (0.65)	1.5 (1.5)	5.25 (1.38)	1	3.19 (0.35)	5 (1.58)	5.25 (0.48)	0	0.75 (0.48)	2 (0)	2.75 (1.03)
Prionospio (*Prionospio*) *dubia*	4 (0.58)	1 (1)	5 (1.35)	4 (0)	2.25 (0.48)	4 (2)	9.5 (1.19)	2	4.62 (0.48)	5.5 (1.55)	3.5 (1.26)	0	3.25 (1.03)	5.5 (0.5)	4 (0.82)
Arthropoda															
Ampelisca pugetica	2 (0)	2 (1)	6 (1.78)	1 (1)	3.75 (1.93)	2 (1)	0.75 (0.75)	3	1.43 (0.20)	0.75 (0.25)	0.5 (0.29)	0	2.25 (1.03)	3 (1)	1 (0.41)

Appendix D.2 *continued*

Mollusca															
Axinopsida serricata	6.67	15.5	31.5	39	23.5	0.5	1.5	15	9	28.25	1.5	0	9.75	1	1
	(3.53)	(1.5)	(6.08)	(1)	(4.73)	(0.5)	(0.29)		(2.14)	(10.19)	(0.5)		(4.01)	(0)	(0.41)
Ennucula tenuis	0.33	1.5	6	1.5	1.5	4.5	7.5	2	3.40	4.25	11.25	0	0.25	3	2.75
	(0.33)	(1.5)	(1.15)	(1.5)	(0.87)	(2.5)	(0.32)		(0.37)	(1.49)	(1.03)		(0.25)	(1)	(1.44)
Annelida (Polychaeta)															
Aricidea (*Acmira*) *lopezi*	0	0	0.25	0	1.25	1	0	0	5.09	0.25	2.25	0	3.75	0	14.75
			(0.25)		(1.25)	(1)			(1.03)	(0.25)	(1.44)		(1.89)		(4.82)
Mollusca															
Micranellum crebricinctum	0	0	0	0	0	0	0	0	0	0	0	0	13.75	1.5	2.5
													(1.49)	(1.5)	(1.5)
Annelida (Polychaeta)															
Capitella teleta	15.33	0	0.25	0	0	0	0.25	26	0.36	0	0	0	0.25	0	0
	(3.28)		(0.25)				(0.25)		(0.12)				(0.25)		
Notomastus sp A	27.33	1.5	1	0.5	0	1.5	1	0	0.26	0	0.25	0	0.75	1	1.25
	(7.31)	(1.5)	(0.41)	(0.5)		(0.5)	(0.71)		(0.07)		(0.25)		(0.48)	(0)	(0.48)
Polycirrus californicus	0	0	0	0	0	0	0	0	0.28	0	0	0	0	0	0.25
									(0.19)						(0.25)
Polycirrus sp A	6	0	4.25	36.5	12.25	1.5	9.25	32	10.72	2.25	5.25	8	7.25	13	6.25
	(4.16)		(0.63)	(12.5)	(2.72)	(0.5)	(1.75)		(1.44)	(1.11)	(0.95)		(3.86)	(1)	(1.44)
Polycirrus sp I	0	0	0.5	1.5	0	0.5	0	0	0.13	0	0	0	0.25	0	0
			(0.5)	(0.5)		(0.5)			(0.05)				(0.25)		
Polycirrus sp OC1	6.3	8.5	0.75	0	0	0	0	0	2.50	0	0.5	0	0.25	1	0.25
	(0.88)	(8.5)	(0.75)						(0.99)		(0.5)		(0.25)	(1)	(0.25)
Polycirrus sp	40.33	9	4.75	0	2.25	16.5	9.5	8	2.83	1	0.25	0	5.5	1	0
	(19.80)	(1)	(0.85)		(1.44)	(3.5)	(5.74)		(0.69)	(0.58)	(0.25)		(4.01)	(0)	
Arthropoda															
Ampelisca pacifica	1.33	5.5	3	3.5	5	4.5	3.25	0	4.81	7	2.75	2	2	3	3.25
	(0.88)	(2.5)	(1.22)	(0.5)	(0.71)	(1.5)	(1.44)		(0.52)	(2.12)	(0.85)		(0.41)	(0)	(0.75)
Eyakia robusta	0	2	1.5	2	4	3	1.75	0	1.51	4.25	2	0	1.75	1	1.5
		(0)	(0.65)	(2)	(0.41)	(0)	(0.25)		(0.27)	(0.95)	(1.22)		(0.63)	(0)	(0.29)
Echinodermata															
Amphiodia digitata	0	3	0.25	2	0.75	9.5	1.25	0	0.40	0.25	0.25	0	8.25	15.5	12.25
		(2)	(0.25)	(0)	(0.48)	(0.5)	(0.48)		(0.10)	(0.25)	(0.25)		(2.56)	(5.5)	(2.02)
Amphiodia urtica	0	1.5	4.75	3.5	15.75	7.5	42.5	8	27.89	56.25	95.75	14	1.75	5.5	4.5
		(0.5)	(1.44)	(0.5)	(2.43)	(1.5)	(3.77)		(2.11)	(5.31)	(4.48)		(1.03)	(1.5)	(2.53)

Appendix D.3

Summary of taxa that distinguish between cluster groups according to SIMPER analysis. Shown are the five taxa with the greatest percent contribution to overall average Bray-Curtis dissimilarity between each group.

Species/Taxa	Average Dissimilarity/ Standard Deviation	Percent Contribution	Cumulative Percent Contribution
Groups A & B			
Notomastus sp A	0.37	1.68	1.68
Capitella teleta	0.18	1.54	3.23
Polycirrus sp	0.37	1.52	4.75
Euclymeninae	0.24	1.36	6.11
Euclymeninae sp A	0.09	1.26	7.37
Groups A & C			
Adontorhina cyclia	0.20	1.79	1.79
Decamastus gracilis	0.39	1.72	3.51
Notomastus sp A	0.33	1.72	5.23
Polycirrus sp	0.56	1.65	6.88
Chloeia pinnata	0.62	1.5	8.38
Groups A & D			
Polycirrus sp	0.84	1.95	1.95
Notomastus sp A	0.34	1.7	3.65
Capitella teleta	0.19	1.49	5.14
Euclymeninae	0.23	1.47	6.61
Chloeia pinnata	0.59	1.35	7.96
Groups A & E			
Polycirrus sp	1.30	2.41	2.41
Notomastus sp A	0.42	2.26	4.66
Chloeia pinnata	1.23	1.78	6.44
Decamastus gracilis	0.52	1.75	8.19
Euclymeninae	0.29	1.73	9.92
Groups A & F			
Amphiodia urtica	0.41	1.97	1.97
Notomastus sp A	0.32	1.92	3.89
Polycirrus sp	0.77	1.87	5.76
Decamastus gracilis	0.45	1.55	7.3
Chloeia pinnata	0.68	1.47	8.78
Groups A & G			
Amphiodia urtica	0.44	3.49	3.49
Polycirrus sp	0.97	2.03	5.51
Notomastus sp A	0.34	2.01	7.52
Decamastus gracilis	0.41	1.94	9.47
Chloeia pinnata	0.90	1.61	11.07
Groups B & C			
Aphelochaeta glandaria Cmplx	0.30	2.01	2.01

Appendix D.3 *continued*

Species/Taxa	Average Dissimilarity/ Standard Deviation	Percent Contribution	Cumulative Percent Contribution
Groups B & C			
Adontorhina cyclia	0.25	1.56	3.57
Aricidea (*Acmira*) *rubra*	0.04	1.51	5.08
Chaetozone sp SD5	0.08	1.33	6.41
Polycirrus sp A	0.08	0.93	7.34
Groups B & D			
Aricidea (*Acmira*) *rubra*	0.04	1.71	1.71
Aphelochaeta glandaria Cmplx	0.24	1.69	3.4
Polycirrus sp A	0.38	1.34	4.74
Aphelochaeta monilaris	0.20	1.26	6
Polycirrus sp	0.30	1.25	7.24
Groups B & E			
Axinopsida serricata	0.02	2.21	2.21
Aphelochaeta glandaria Cmplx	0.09	2.03	4.25
Aphelochaeta monilaris	0.02	1.9	6.15
Aricidea (*Acmira*) *rubra*	0.02	1.86	8.01
Polycirrus sp	0.20	1.7	9.71
Groups B & F			
Amphiodia urtica	0.49	1.93	1.93
Aphelochaeta glandaria Cmplx	0.42	1.65	3.58
Aricidea (*Acmira*) *rubra*	0.20	1.6	5.18
Polycirrus sp A	0.52	1.52	6.71
Chaetozone sp SD5	0.11	1.49	8.19
Groups B & G			
Amphiodia urtica	0.57	3.77	3.77
Aphelochaeta glandaria Cmplx	0.26	2.31	6.08
Aricidea (*Acmira*) *rubra*	0.04	1.67	7.75
Chaetozone sp SD5	0.09	1.48	9.23
Chloeia pinnata	0.12	1.41	10.63
Groups C & D			
Adontorhina cyclia	0.33	2.03	2.03
Axinopsida serricata	0.53	1.9	3.93
Amphiodia digitata	0.32	1.47	5.4
Chaetozone hartmanae	0.28	1.28	6.68
Euphilomedes producta	0.33	1.05	7.73
Groups C & E			
Axinopsida serricata	0.49	3.02	3.02
Adontorhina cyclia	0.32	2.6	5.62
Ennucula tenuis	0.19	1.31	6.93

Appendix D.3 *continued*

Species/Taxa	Average Dissimilarity/ Standard Deviation	Percent Contribution	Cumulative Percent Contribution
Groups C & E			
Lumbrineris sp Group I	0.19	1.3	8.23
Ampelisca pugetica	0.31	1.3	9.53
Groups C & F			
Adontorhina cyclia	0.51	1.81	1.81
Axinopsida serricata	0.56	1.73	3.54
Euphilomedes producta	0.43	1.57	5.11
Amphiodia urtica	0.48	1.46	6.57
Aricidea (*Acmira*) *catherinae*	0.47	1.05	7.62
Groups C & G			
Amphiodia urtica	0.56	3.56	3.56
Axinopsida serricata	0.65	1.7	5.26
Chaetozone hartmanae	0.29	1.61	6.86
Adontorhina cyclia	0.75	1.4	8.26
Rhepoxynius bicuspidatus	0.18	1.06	9.33
Groups D & E			
Amphiodia digitata	0.44	2.08	2.08
Amphiodia urtica	0.53	1.42	3.5
Aricidea (*Acmira*) *lopezi*	0.79	1.36	4.86
Micranellum crebricinctum	0.70	1.33	6.19
Chloeia pinnata	0.74	1.25	7.44
Groups D & F			
Amphiodia urtica	0.61	1.95	1.95
Amphiodia digitata	0.39	1.57	3.52
Micranellum crebricinctum	0.52	1.18	4.7
Monticellina siblina	0.63	1.17	5.86
Aricidea (*Acmira*) *lopezi*	0.52	1.11	6.97
Groups D & G			
Amphiodia urtica	0.71	4.09	4.09
Amphiodia digitata	0.41	1.72	5.81
Monticellina siblina	0.73	1.4	7.21
Adontorhina cyclia	0.73	1.34	8.55
Axinopsida serricata	0.74	1.29	9.84
Groups E & F			
Axinopsida serricata	0.92	1.83	1.83
Prionospio (*Prionospio*) *dubia*	0.39	1.49	3.32
Praxillella pacifica	0.53	1.47	4.79
Aricidea (*Acmira*) *catherinae*	0.58	1.46	6.25
Lumbrineris cruzensis	0.73	1.3	7.55

Appendix D.3 *continued*

Species/Taxa	Average Dissimilarity/ Standard Deviation	Percent Contribution	Cumulative Percent Contribution
Groups E & G			
Amphiodia urtica	0.77	3.95	3.95
Axinopsida serricata	1.26	2.4	6.34
Ennucula tenuis	0.51	2.14	8.48
Mediomastus sp	0.43	2.1	10.59
Adontorhina cyclia	1.24	1.94	12.53
Groups F & G			
Amphiodia urtica	0.71	2.52	2.52
Euphilomedes producta	0.54	2	4.52
Axinopsida serricata	0.75	1.67	6.19
Adontorhina cyclia	0.73	1.57	7.76
Euphilomedes carcharodonta	0.52	1.46	9.22