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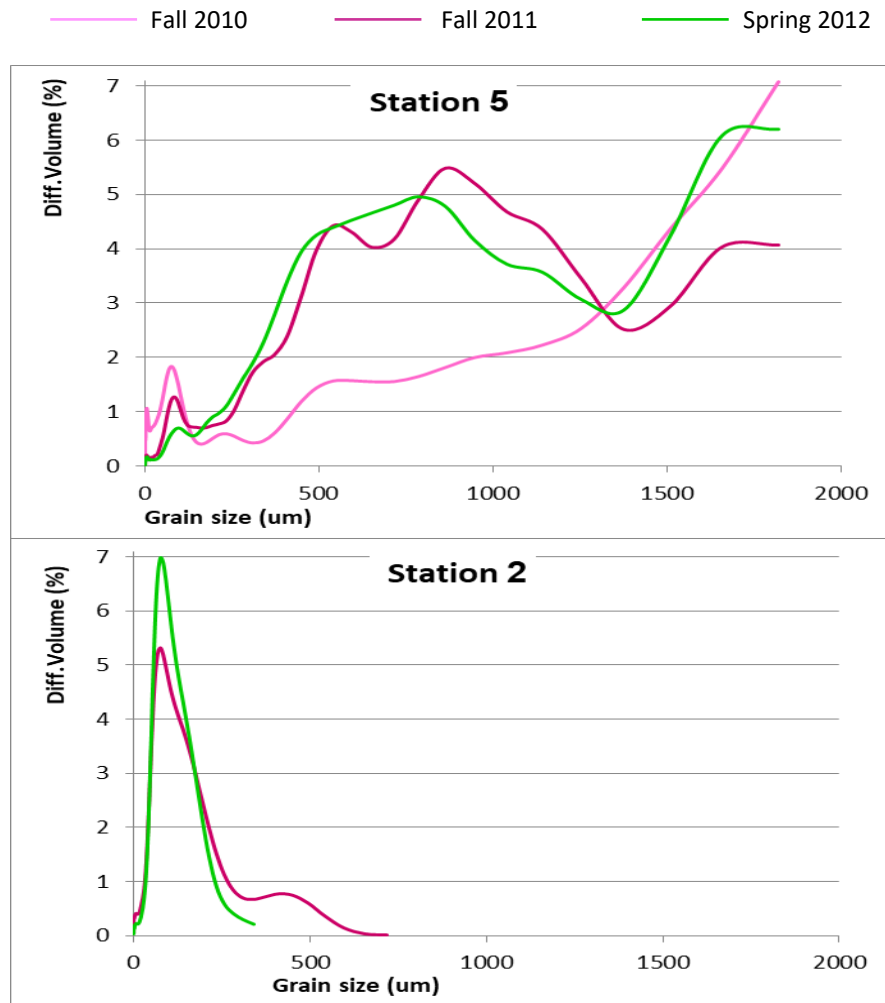
Supplementary Data

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**Fig. 1S:** Grain size relative volumes in ASC entrance stations (St. 2, 5) by seasons. Representations of % volume along the X axis are not equally spaced (the counter issues a value after counting a given number of particles) such that the area under the curve gets exaggerated at larger (and less frequent) grain sizes and the contribution of sand is over-portrayed. Therefore, one cannot visually compare areas under different curves in a panel, even though they all sum up to 100%.

**Table S1.** Benthic samples (500 ml of wet sediment) list with bottom depth, season, number of taxa and specimens and Shannon's diversity index ( $H'$ ). ASC east channel in green, ASC west channel in blue, and AS in red.

Station	Depth (m)	Season	# Taxa	# Specimens	$H'$
3	174	Fall 2010	3	4	1.04
3	203	Summer 2011	6	14	1.04
3	160	Fall 2011	3	3	1.10
3	163	Winter 2012	7	17	1.61
3	177	Spring 2012	4	8	0.80
3	178	Summer 2012	4	14	0.93
3	160	Spring 2013	6	17	1.08
4	420	Fall 2010	3	11	0.33
4	420	Fall 2011	1	1	0
4	338	Spring 2012	3	8	0.97
4	400	Summer 2012	13	96	1.35
4	364	Spring 2013	3	7	1.00
6	155	Fall 2010	1	1	0
6	145	Fall 2011	5	8	1.49
6	144	Winter 2012	0	0	0
6	157	Spring 2012	4	12	0.84
6	152	Summer 2012	10	26	1.62
6	135	Spring 2013	5	12	1.10
7	220	Winter 2012	1	1	0
7	376	Spring 2012	1	1	0
7	440	Summer 2012	12	23	2.17
7	458	Spring 2013	4	5	1.04
8	167	Fall 2011	2	4	0
8	134	Winter 2012	0	0	0
8	140	Spring 2012	5	10	1.42
8	150	Summer 2012	3	5	1.06
8	135	Spring 2013	1	1	0
9	350	Winter 2012	1	1	0
9	300	Spring 2012	1	1	0
9	360	Summer 2012	4	4	1.39
9	285	Spring 2013	0	0	0

**Table S2.** Results (p values) of the Generalized Linear Modelling tests on granulometry, TOC and BMF. Significant and highly significant effects are lightly and darkly shaded, respectively.

	TOC	Mode grain size	Sand content (%)	Abundance (specimens /500ml)	Richness (# taxa)	Diversity Phylum ( $H'$ )	Polychaete abundance (specimens /500ml)
Intercept	<0.001	<0.001	<0.001	<0.001	<0.001	0.019	<0.001
Depth	0.071	0.001	0.018	0.376	0.808	0.620	0.011
Site	0.002	<0.001	0.160	0.004	0.040	0.146	<0.001
Season	0.086	0.102	0.166	0.011	0.001	0.034	0.013

**Table S3.** Correlation matrix. Correlation coefficient values and p values above and below the diagonal, respectively. Significant and highly significant correlations are lightly and darkly shaded, respectively.

	Abund	Abund P	Richness	DiversT	ModeGS	% sand	Bfrac	TOC	Depth
<b>Abund</b>		0.945	0.935	0.779	0.169	0.524	0.457	-0.071	0.082
<b>Abund P</b>	<0.001		0.886	0.736	0.138	0.428	0.512	-0.142	-0.046
<b>Richness</b>	<0.001	<0.001		0.890	0.094	0.573	0.417	-0.052	0.007
<b>DiversT</b>	<0.001	<0.001	<0.001		0.037	0.097	0.389	-0.037	-0.051
<b>ModeGS</b>	0.419	0.510	0.655	0.861		0.468	0.390	0.029	0.596
<b>% sand</b>	0.007	0.033	0.003	0.645	0.018		0.304	-0.205	0.478
<b>Bfrac</b>	0.025	0.010	0.042	0.060	0.049	0.134		-0.206	0.254
<b>TOC</b>	0.736	0.499	0.804	0.860	0.889	0.326	0.313		0.182
<b>Depth</b>	0.664	0.808	0.971	0.761	0.002	0.016	0.210	0.385	

Abund – abundance; P – polychaete; DiversT – taxon diversity; GS – grain size, Bfrac – biogenic fraction of sand/

**Table S4.** Sediment granulometry (clay = < 2µm, silt = > 2 to < 63µm, sand = > 63µm) and TOC. ASC east channel in green, ASC west channel in blue, and AS in red. \*For technical reasons, sampling of St. 7 in winter 2012 was at half the intended depth.

**Canyon**

Station No.	Season	Depth (m)	Clay (%)	Silt (%)	Sand (%)	Mode grain size (µm)	TOC (%)
3	Fall 2010	174	27.6	69.7	2.7	7.1	0.82
3	Summer 2011	203	10.2	70.7	19.1	7.1	0.83
3	Fall 2011	160	29.8	69.5	0.7	6.5	1.08
3	Winter 2012	163	11.3	84.2	4.5	7.8	0.87
3	Spring 2012	177	20.5	68.2	11.3	60.5	0.69
3	Summer 2012	178	13.9	79.7	6.3	55.1	0.88
4	Fall 2010	420	20.4	69.3	10.3	60.5	0.77
4	Fall 2011	420	18.1	64.2	17.7	66.5	0.95
4	Spring 2012	338	26.9	68.4	4.8	60.5	1.10
4	Summer 2012	400	12.3	52.0	35.8	80.1	0.88
6	Fall 2010	155	27.0	70.9	2.1	5.9	0.81
6	Fall 2011	145	26.9	70.6	2.4	6.5	0.84
6	Winter 2012	144	26.9	70.2	3.0	7.8	1.05
6	Spring 2012	157	15.3	78.5	6.3	5.4	1.07
6	Summer 2012	152	26.7	70.2	3.0	6.5	1.18
7	Winter 2012	220*	17.3	78.6	4.1	7.8	0.88
7	Spring 2012	376	11.8	83.6	4.6	9.4	1.15
7	Summer 2012	440	19.8	64.6	15.6	8.5	1.15

**Slope**

StationNo.	Season	Depth (m)	Clay (%)	Silt (%)	Sand (%)	Mode grain size (µm)	TOC (%)
8	Fall 2011	167	25.8	66.2	8.0	6.5	0.80
8	Winter 2012	134	16.0	83.8	0.2	7.8	0.94
8	Spring 2012	140	17.5	75.2	7.3	6.5	1.04
8	Summer 2012	150	24.0	67.8	8.2	7.1	0.78
9	Summer 2011	483	12.1	74.1	13.8	6.5	0.89
9	Winter 2012	350	11.9	84.1	4.1	6.5	1.07
9	Spring 2012	300	15.9	81.1	3.1	6,5	0.64
9	Summer 2012	360	28.6	70.5	0.9	8.5	1.00

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**Canyon entrance**

<b>Station No.</b>	<b>Season</b>	<b>Depth (m)</b>	<b>Clay (%)</b>	<b>Silt (%)</b>	<b>Sand (%)</b>	<b>Mode grain size (µm)</b>	<b>TOC (%)</b>
2	Fall 2011	46	4.1	35.5	60.4	72.9	0.44
2	Spring 2012	46	2.3	31.9	65.9	72.9	0.58
5	Fall 2010	45	7.3	34.2	58.6	5.35	0.48
5	Fall 2011	47	2.1	8.9	89.0	80.1	0.80
5	Spring 2012	46	1.1	5.5	93.7	9.37	0.50