MODEL RESULTS SUMMARY

The model is set up for PCB 118. However, the LWG data only includes PCB 106&118, so we used those values (i.e., treated them as if they were PCB 118) for calculating stormwater loads.

The data below is arranged to coincide with the 37 model segments, as shown here:

West	1	4	7	10	13	16	19	22	25	28	31	34
Center	2	5	8	11	14	17	20	23	26	29	32	35
East	3	6	9	12	15	18	21	24	27	30	33	36
Lagoon					37							
RM 12.0	RM 10.4	RM 10.0	RM 9.4	RM 8.3	RM 7.5	RM 6.85	RM 6.05	RM 5.35	RM 4.7	RM 4.05	RM 3.4	RM 1.8

SEDIMENT

Starting with clean sediments and upstream flow being the only source of PCBs, how much did the sediment concentration increase when stormwater was added to the system? [Scenario #1 and #2]

West	0	0	0	0	0	0	0	0	0	0	0	0
Center	0	0	0	0	0	0	0	0	0	0	0	0
East	0	0	0	0	0	0	0	0	0	0	0	0
Lagoon					0							

NOTE: In actuality, these numbers are >0 but are so small they round to zero. However, because there is considerable +/- uncertainty, they should not be treated as absolutes.

FISH TISSUE

What percentage of the modeled fish tissue concentration can be attributed to stormwater when stormwater and upstream are the only sources? [Scenario #1 and #2]

West	0.30%	4.85%	6.41%	14.41%	14.85%	13.86%	14.48%	14.24%	13.78%	13.15%	16.16%	16.85%
Center	1.04%	-1.45%	-2.02%	0.17%	-0.11%	-0.25%	0.60%	-0.55%	-1.97%	-0.23%	-0.80%	-1.02%
East	2.56%	0.79%	3.75%	2.85%	3.74%	4.90%	5.92%	3.84%	8.51%	41.50%	52.77%	53.48%
Lagoon					98.39%							

What percentage of the modeled fish tissue concentration can be attributed to stormwater when sediment concentration throughout the harbor is set at a hypothetical clean up value? [Scenario #4 and #5] [In an attempt to represent what the average sediment concentration in the harbor would be if "hot spots" were cleaned up, the initial total concentration in sediment for each model segment was derived by averaging the 90th percentile of the values in all 105 model segments.]

West	-1.17%	2.19%	2.59%	9.47%	9.47%	7.37%	11.01%	9.58%	6.08%	8.17%	8.81%	9.51%
Center	-0.50%	1.56%	0.46%	1.44%	0.81%	-1.92%	-0.63%	-0.90%	0.40%	-1.21%	1.45%	0.66%
East	1.18%	-0.60%	1.45%	2.09%	1.19%	2.05%	3.66%	2.11%	2.70%	26.86%	39.08%	42.34%
Lagoon					52.52%							

What percentage of the modeled fish tissue concentration can be attributed to stormwater when sediment concentrations are set at currently observed levels? [Scenario #6 and #7]

West	3.11%	2.94%	5.75%	2.57%	10.29%	8.22%	6.07%	10.94%	12.77%	5.16%	14.43%	15.61%
Center	-0.41%	-1.46%	-0.96%	-0.14%	-1.29%	-1.08%	1.10%	0.91%	-0.10%	0.36%	-1.85%	-1.58%
East	2.97%	3.48%	2.99%	0.99%	2.14%	2.99%	1.98%	0.11%	7.96%	43.04%	-1.71%	6.08%
Lagoon					27.73%							

BOLD > 5%

NOTE: Several of the food web model parameters are expressed as uniform random variables, meaning their value is not fixed and changes with every iteration of the model. For this reason, and because of unexpressed uncertainty, anything less than a ~5% difference should not be considered meaningful.

Modeled average tissue concentrations (ug/kg)

Segments	*1-3*	*4-6*	*7-9*	*10-12*	*13-15 37*	*16-18*	*19-21*	*22-24*	*25-27*	*28-30*	*31-33*	*34-36*		
West	**1**	**4**	**7**	**10**	**13**	**16**	**19**	**22**	**25**	**28**	**31**	**34**		
Center	**2**	**5**	**8**	**11**	**14**	**17**	**20**	**23**	**26**	**29**	**32**	**35**		
East	**3**	**6**	**9**	**12**	**15**	**18**	**21**	**24**	**27**	**30**	**33**	**36**		
Lagoon					**37**									
	RM 12.0	**RM 10.4**	**RM 10.0**	**RM 9.4**	**RM 8.3**	**RM 7.5**	**RM 6.85**	**RM 6.05**	**RM 5.35**	**RM 4.7**	**RM 4.05**	**RM 3.4**	**RM 1.8**	
Scenario #1: Upstream load only													FCAV = 5.9	
	5.93	5.92	5.89	5.75	5.78	5.72	5.67	5.63	5.60	5.63	5.54	6.66	10.8%	exceeding
	4.43	4.49	4.58	4.43	4.39	4.42	4.33	4.33	4.33	4.34	4.32	1.74	5.26	harbor average
	5.90	5.98	5.81	5.82	5.74	5.72	5.60	5.69	5.53	5.53	5.53	6.71	0.92	stdev
					0.09									
Scenario #2: Upstream load plus stormwater load													FCAV = 5.9	
	5.95	6.22	6.30	6.72	6.79	6.64	6.63	6.56	6.49	6.48	6.61	8.01	59.5%	exceeding
	4.48	4.42	4.49	4.44	4.39	4.41	4.36	4.31	4.25	4.33	4.29	1.72	6.08	harbor average
	6.06	6.03	6.04	6.00	5.96	6.02	5.96	5.91	6.05	9.45	11.71	14.43	2.20	stdev
					5.31									
Scenario #3: Upstream load plus stormwater load plus sediment at SLV (0.12 ug/kg)													FCAV = 5.9	
	6.14	6.56	6.47	6.77	6.83	6.90	6.86	6.82	6.74	6.71	6.83	8.13	59.5%	exceeding
	4.72	4.68	4.61	4.63	4.58	4.52	4.56	4.52	4.57	4.52	4.47	1.92	6.26	harbor average
	6.22	6.25	6.23	6.21	6.23	6.20	6.03	6.09	6.22	9.54	11.66	14.43	2.16	stdev
					5.39									
Scenario #4: Upstream load plus sediment at harbor average less "hot spots" (sediment 2.86 ug/kg)													FCAV = 5.9	
	10.49	10.38	10.35	10.08	10.07	10.10	9.97	10.06	10.50	10.38	10.18	11.24	89.2%	exceeding
	8.78	8.68	8.83	8.69	8.87	8.98	8.73	8.94	8.74	8.87	8.69	6.01	9.71	harbor average
	10.45	10.50	10.17	10.17	10.14	10.11	9.96	9.91	10.39	10.37	9.95	10.87	0.97	stdev
					4.63									
Scenario #5: Upstream load plus stormwater load plus sediment at harbor average less "hot spots" (sediment 2.86 ug/kg)													FCAV = 5.9	
	10.37	10.61	10.62	11.13	11.13	10.90	11.20	11.12	11.18	11.30	11.17	12.42	89.2%	exceeding
	8.74	8.82	8.87	8.82	8.94	8.81	8.68	8.86	8.77	8.76	8.82	6.05	10.53	harbor average
	10.58	10.44	10.32	10.39	10.26	10.32	10.34	10.12	10.68	14.18	16.33	18.85	2.24	stdev
					9.75									
Scenario #6: Upstream load plus sediment at presently observed concentrations													FCAV = 5.9	
	7.22	10.41	5.90	92.22	8.39	13.90	11.27	8.62	5.92	15.63	7.12	7.35	56.8%	exceeding
	4.45	4.84	4.44	4.40	4.44	5.55	12.12	5.18	4.97	4.67	4.39	2.48	40.39	harbor average
	6.64	7.01	5.87	7.47	15.29	7.42	11.21	13.63	6.18	5.42	591.80	520.38	127.96	stdev
					13.51									
Scenario #7: Upstream load plus stormwater load plus sediment and presently observed concentrations													FCAV = 5.9	
	7.45	10.73	6.26	94.65	9.35	15.14	11.99	9.68	6.79	16.48	8.32	8.71	62.2%	exceeding
	4.43	4.77	4.40	4.40	4.38	5.49	12.25	5.23	4.97	4.68	4.31	2.45	41.54	harbor average
	6.84	7.27	6.06	7.55	15.62	7.65	11.44	13.64	6.72	9.52	581.87	554.07	130.38	stdev
					18.69									

Modeled Fish Tissue Concentrations with Attribution to Various Sources

Under Observed Sediment Concentrations

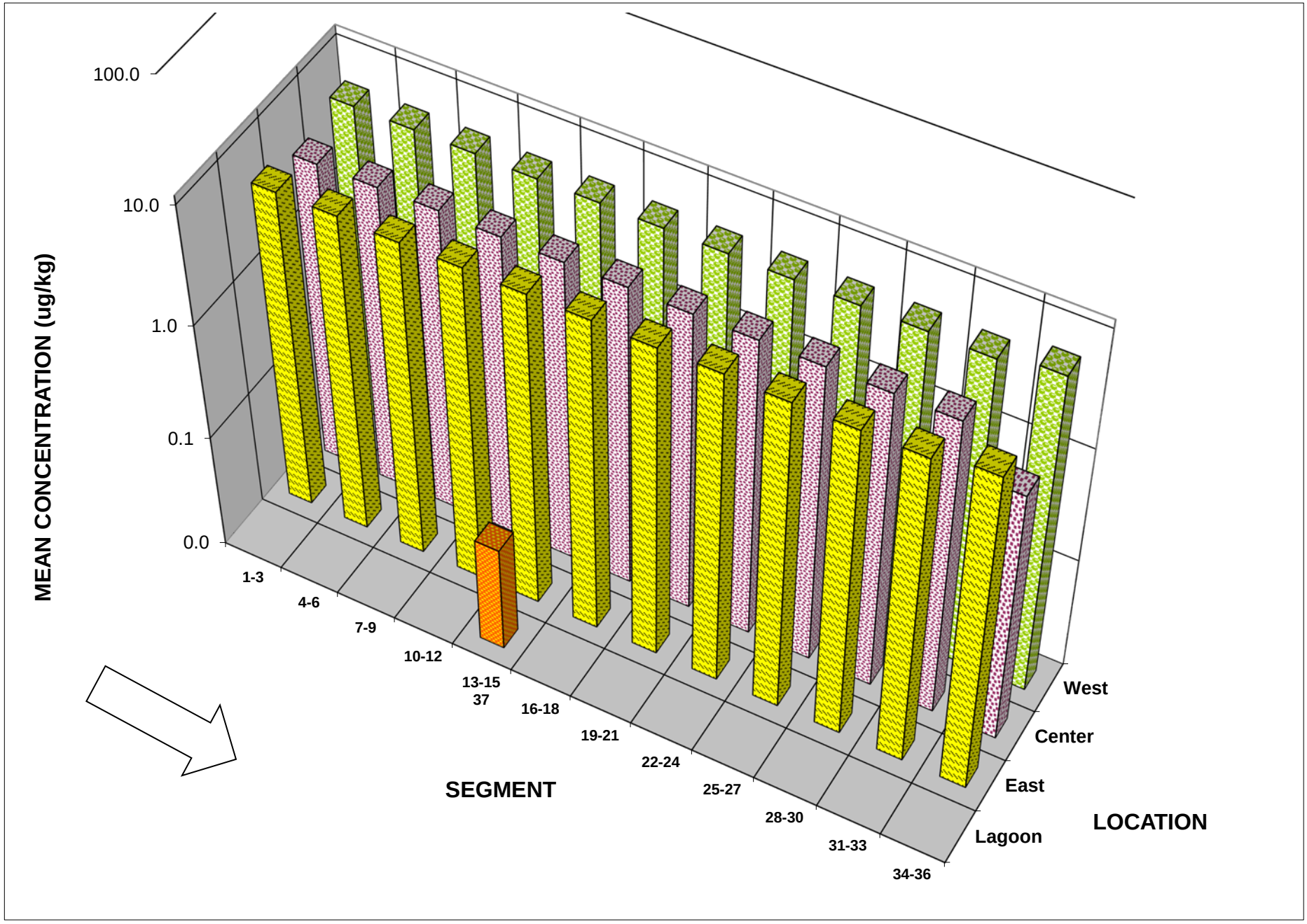
Upstream Component Scenario #1)											
5.93	5.92	5.89	5.75	5.78	5.72	5.67	5.63	5.60	5.63	5.54	6.66
4.43	4.49	4.58	4.43	4.39	4.42	4.33	4.33	4.33	4.34	4.32	1.74
5.90	5.98	5.81	5.82	5.74	5.72	5.60	5.69	5.53	5.53	5.53	6.71
				0.09							
Sediment Component (Scenario #6 - Scenario #1)											
1.29	4.49	0.01	86.47	2.61	8.18	5.59	2.99	0.32	9.99	1.58	0.69
0.02	0.35	-0.14	-0.03	0.04	1.13	7.78	0.85	0.64	0.33	0.06	0.74
0.74	1.03	0.07	1.65	9.55	1.70	5.61	7.94	0.65	-0.10	586.27	513.67
				13.42							
Stormwater Component (Scenario #7 - Scenario #6)											
0.23	0.32	0.36	2.43	0.96	1.24	0.73	1.06	0.87	0.85	1.20	1.36
-0.02	-0.07	-0.04	-0.01	-0.06	-0.06	0.14	0.05	-0.01	0.02	-0.08	-0.04
0.20	0.25	0.18	0.07	0.33	0.23	0.23	0.01	0.53	4.10	-9.93	33.69
				5.18							

Under Harbor Average Less "Hot Spots"

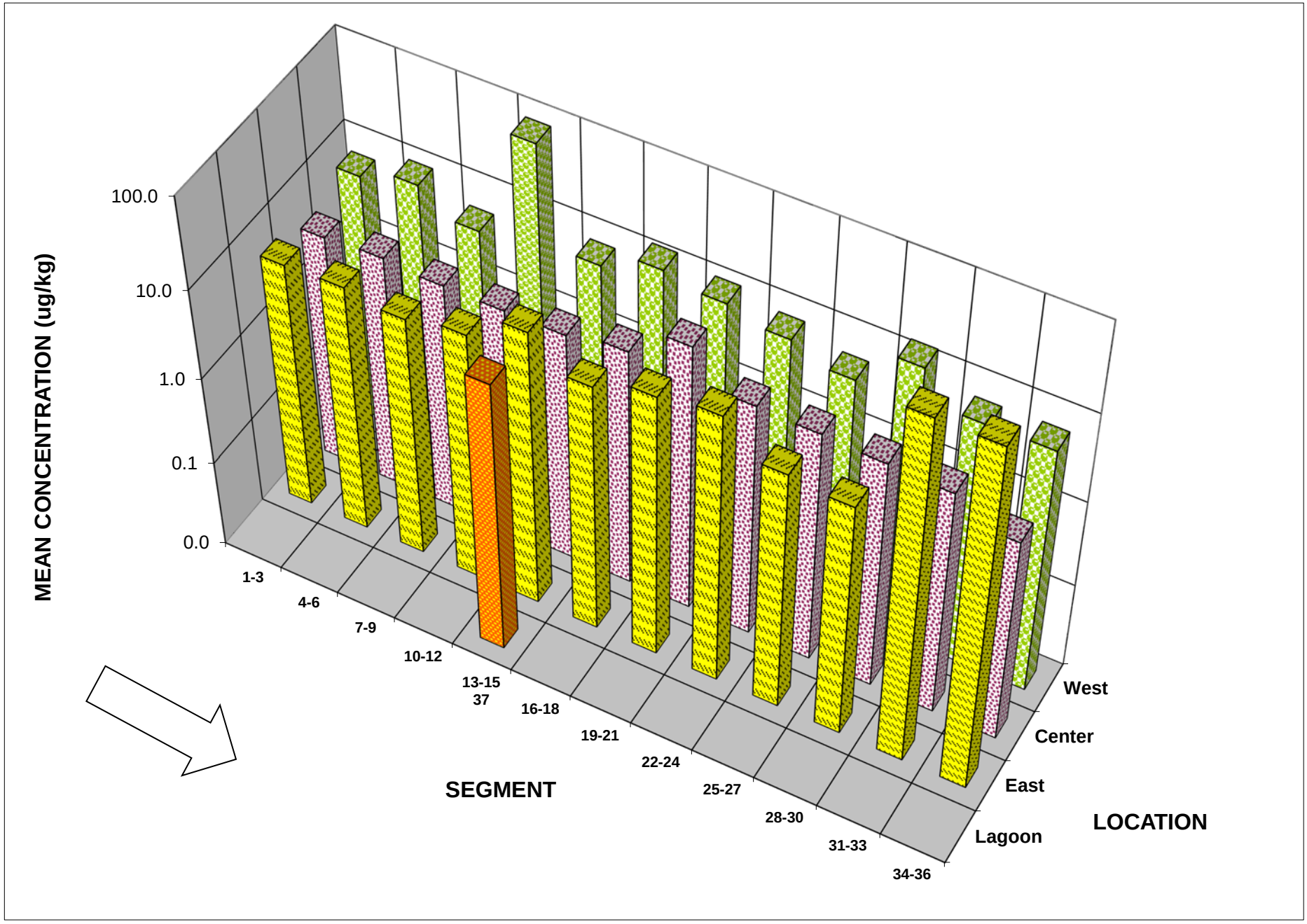
Upstream Component Scenario #1)											
5.93	5.92	5.89	5.75	5.78	5.72	5.67	5.63	5.60	5.63	5.54	6.66
4.43	4.49	4.58	4.43	4.39	4.42	4.33	4.33	4.33	4.34	4.32	1.74
5.90	5.98	5.81	5.82	5.74	5.72	5.60	5.69	5.53	5.53	5.53	6.71
				0.09							
Sediment Component (Scenario #4 - Scenario #1)											
4.56	4.46	4.46	4.32	4.29	4.38	4.30	4.43	4.90	4.75	4.65	4.58
4.35	4.20	4.25	4.26	4.48	4.56	4.40	4.60	4.41	4.53	4.37	4.27
4.55	4.52	4.36	4.34	4.40	4.39	4.36	4.22	4.86	4.85	4.42	4.16
				4.54							
Stormwater Component (Scenario #5 - Scenario #4)											

-0.12	0.23	0.27	1.05	1.05	0.80	1.23	1.07	0.68	0.92	0.98	1.18
-0.04	0.14	0.04	0.13	0.07	-0.17	-0.05	-0.08	0.03	-0.11	0.13	0.04
0.13	-0.06	0.15	0.22	0.12	0.21	0.38	0.21	0.29	3.81	6.38	7.98
				5.12							

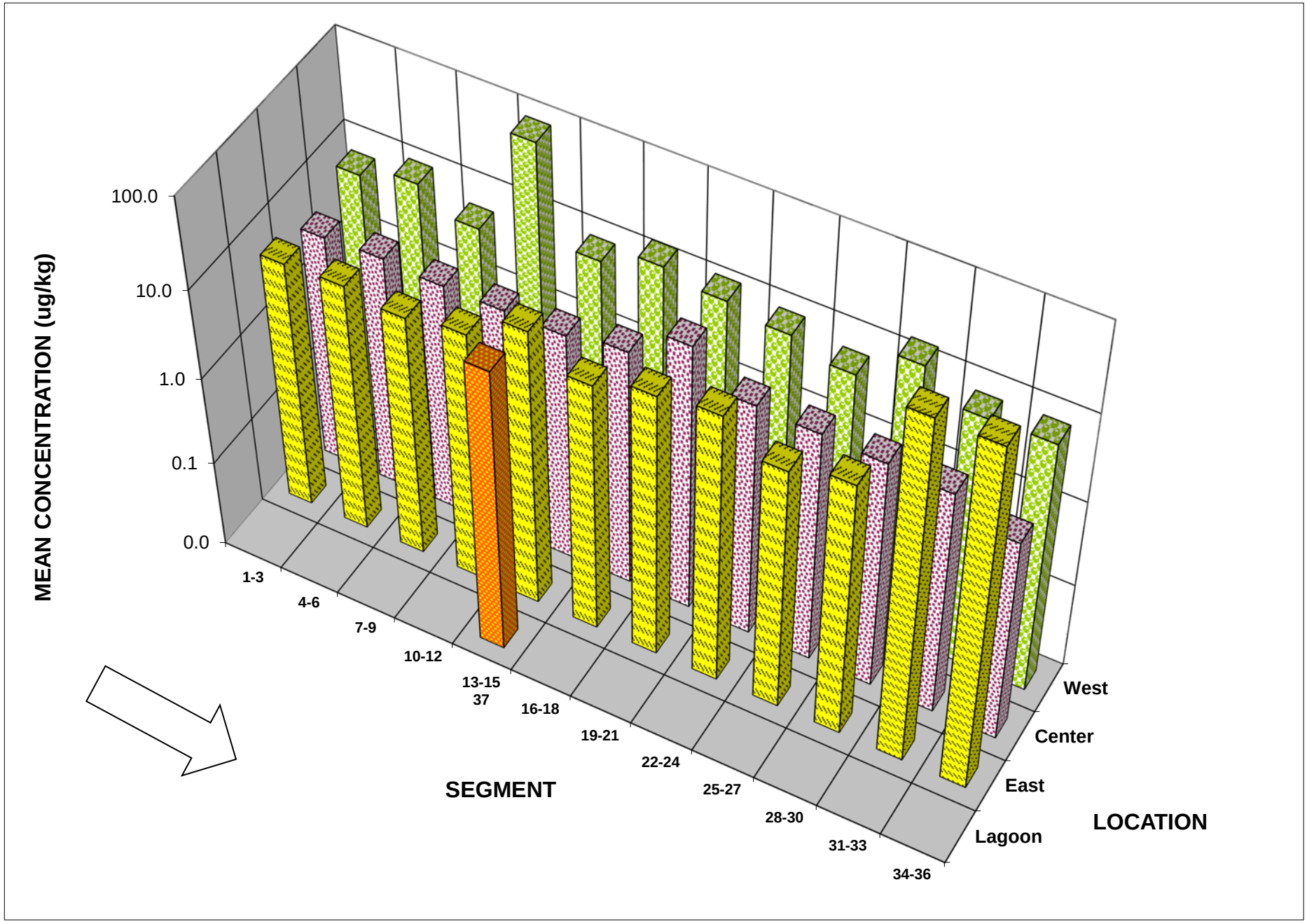
Upstream Load Only

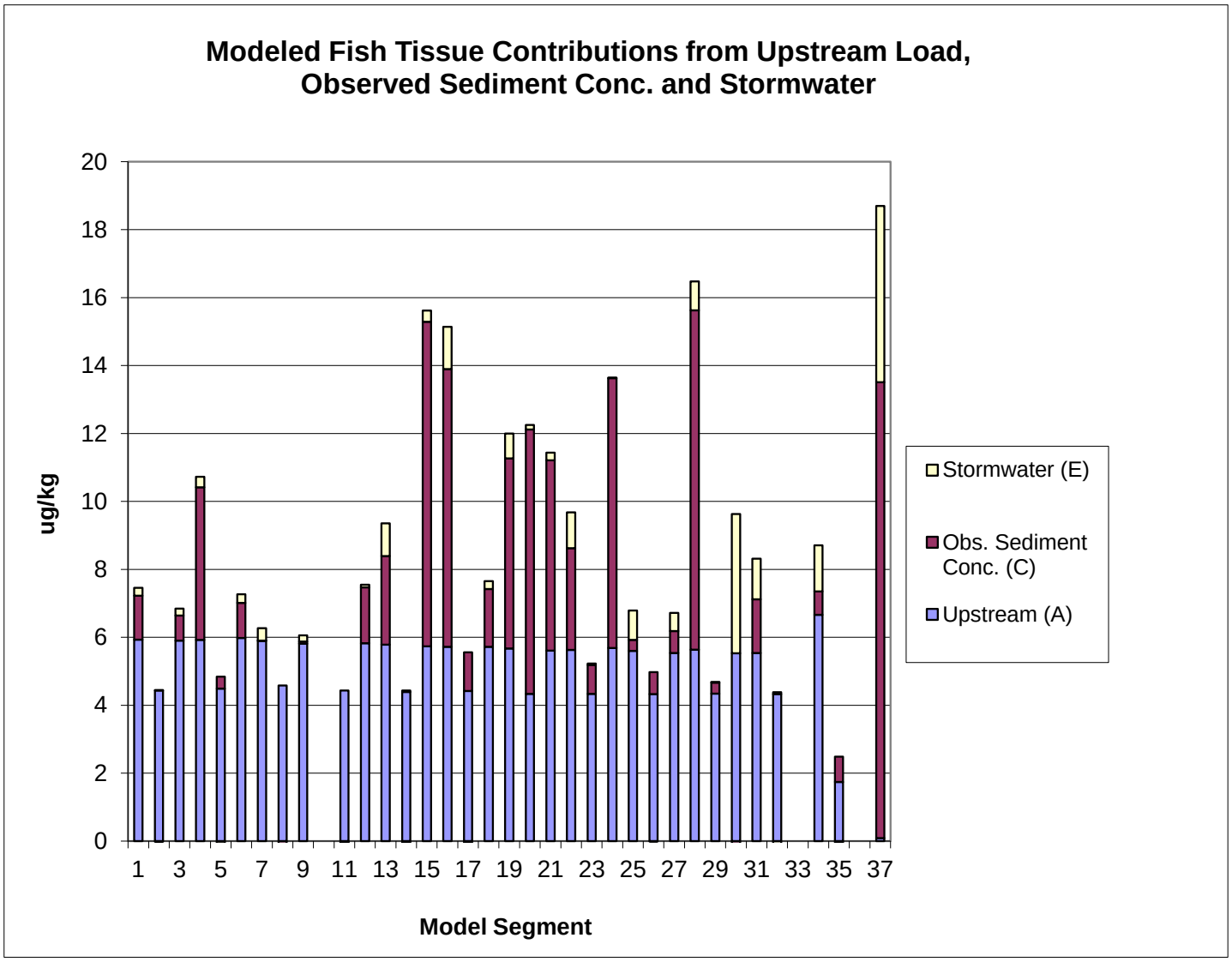


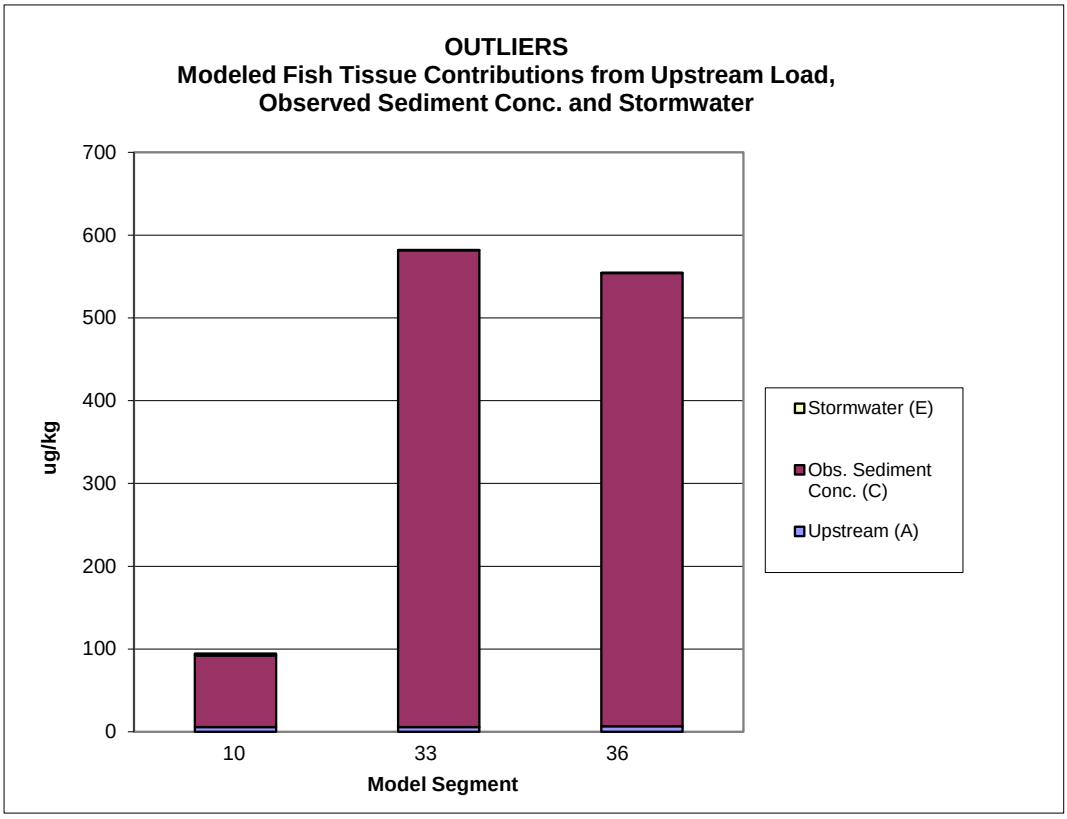
Upstream Plus Observed Sediment Conc.



Upstream Plus Observed Sediment Conc. Plus Stormwater




Modeled Fish Tissue Contributions from Upstream Load, Observed Sediment Conc. and Stormwater
ug/kg
0
2
4
6
8
10
12
14
16
18
20
1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31 33 35 37
Model Segment
Stormwater (E)
Obs. Sediment Conc. (C)
Upstream (A)


OUTLIERS
Modeled Fish Tissue Contributions from Upstream Load, Observed Sediment Conc. and Stormwater
ug/kg
0
100
200
300
400
500
600
700
10 33 36
Model Segment
Stormwater (E)
Obs. Sediment Conc. (C)
Upstream (A)