

Endocrine Disrupting Chemicals in New Orleans Urban Environment

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Endocrine Disrupting Chemicals (EDCs)

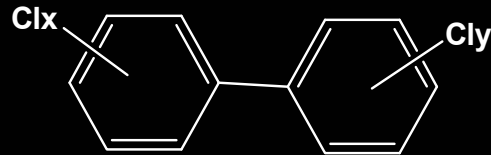
- Endocrine disrupting chemicals (EDCs) are exogenous substances that alter functions of the endocrine system and cause adverse health effects in an intact organism.
- Hundreds of environmental pollutants have been reported as known or potential endocrine disruptors, including natural and synthetic hormones, pesticides, and bisphenol A.

OBJECTIVE

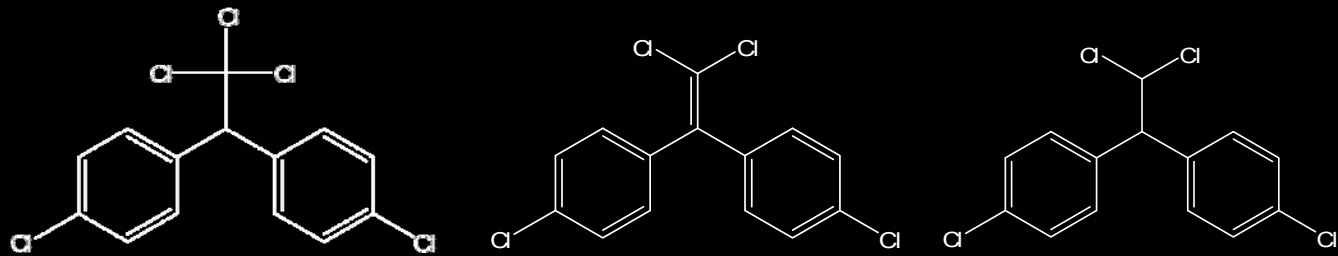
- To identify and quantitatively measure endocrine disruptors in New Orleans urban environment
- To investigate the source and distribution of endocrine disruptors in the Mississippi river delta and the Gulf of Mexico

Environmental EDCs

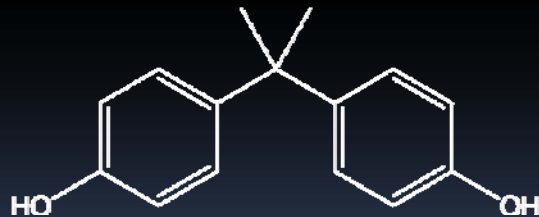
- PCBs/dioxins



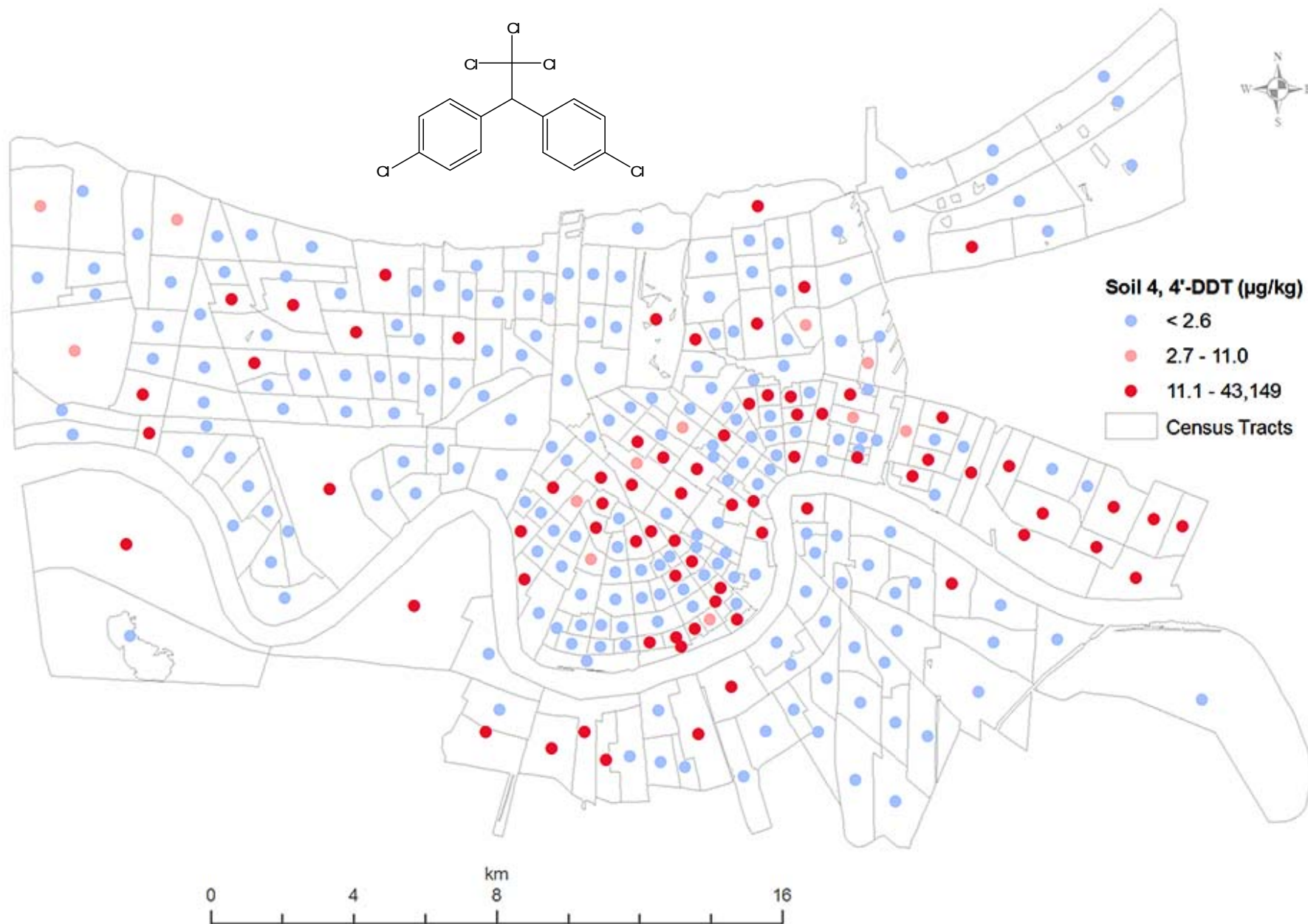
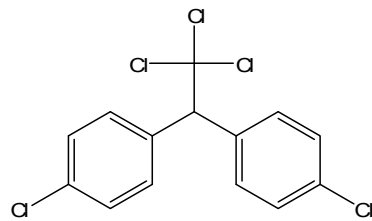
- DDT/DDE/DDD



- Bisphenol A

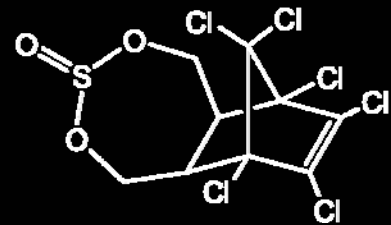
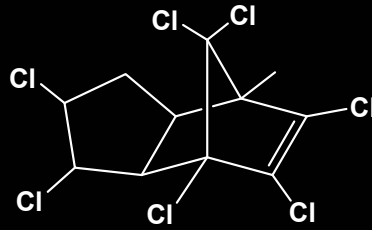
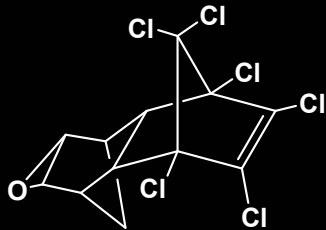


4,4'-DDT Concentrations in New Orleans Soils

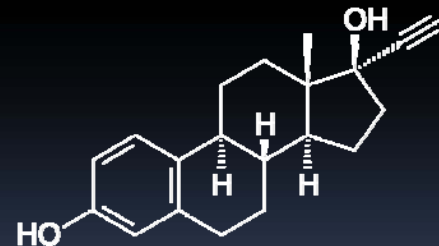
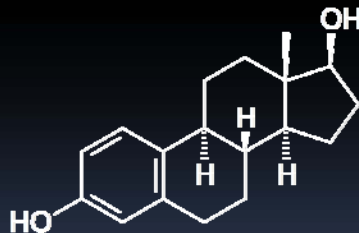
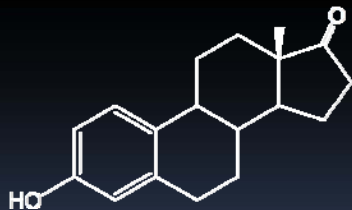


More EDCs

- Organochlorines
e.g. dieldrin, chlordane, endosulfan



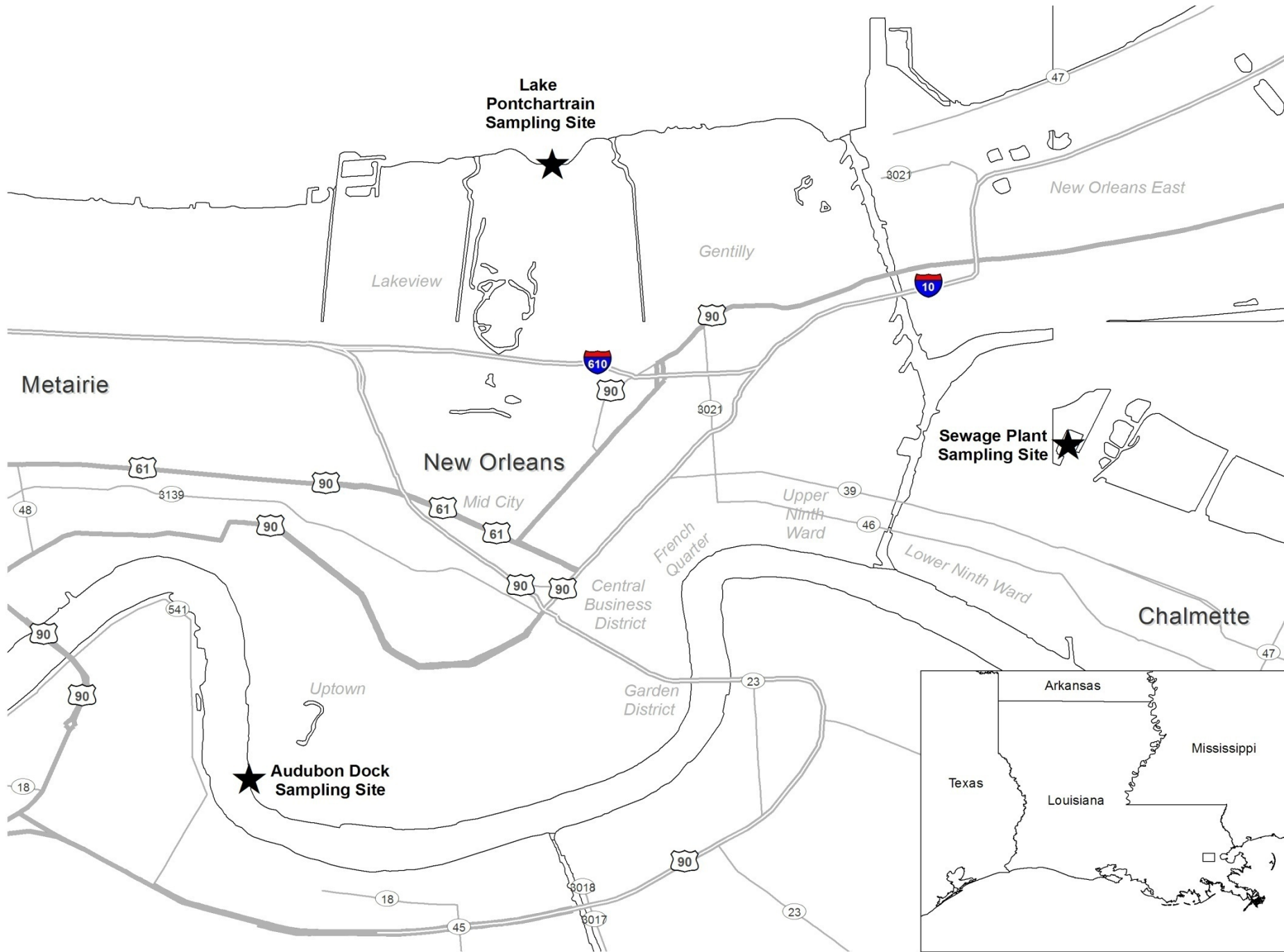
- Natural and synthetic hormones
e.g. estrone, 17β -estradiol, 17α -ethinylestradiol



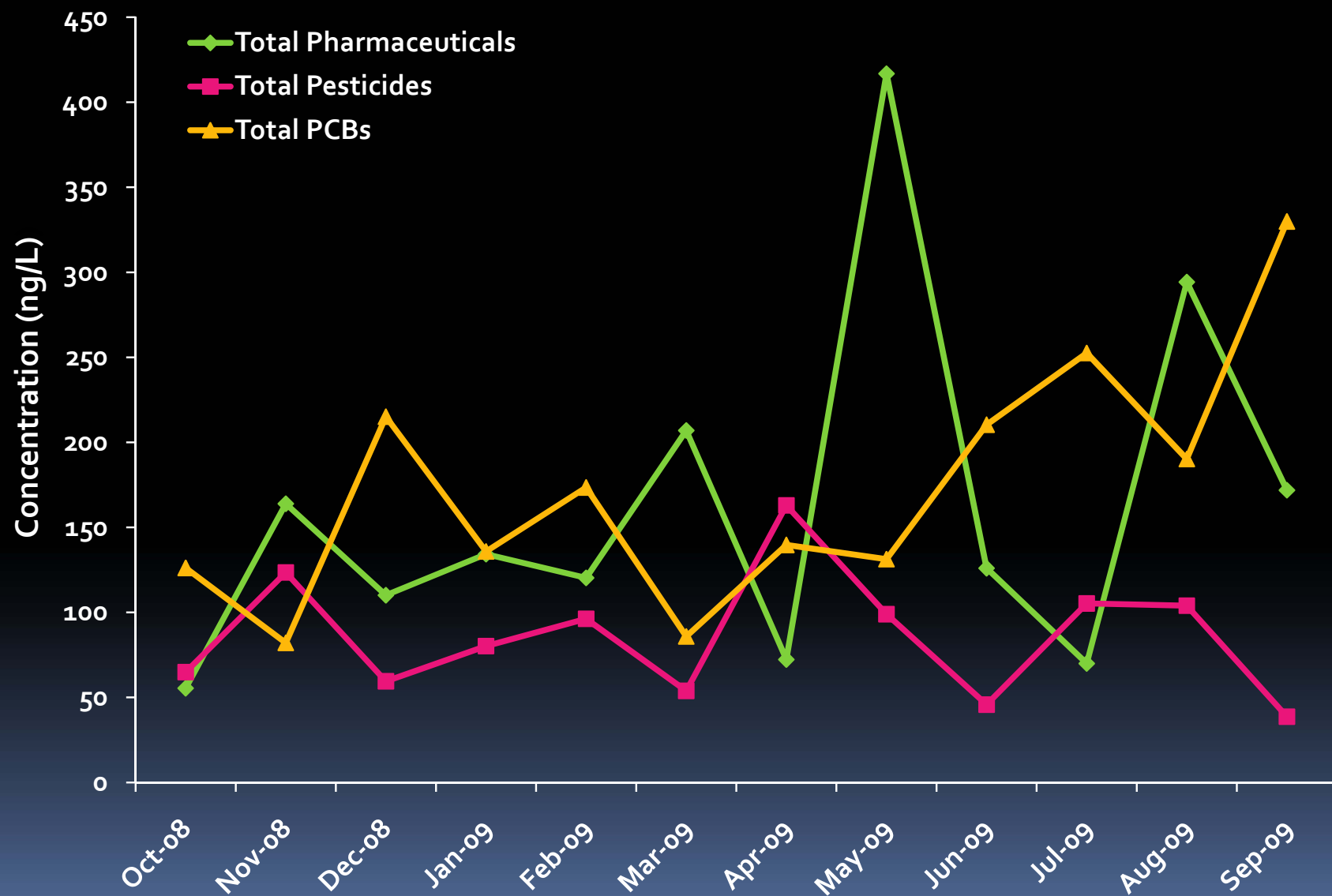
- Various other compounds:
phthalates, alkylphenols, and phytoestrogens

List of Organochlorine Pesticides Monitored

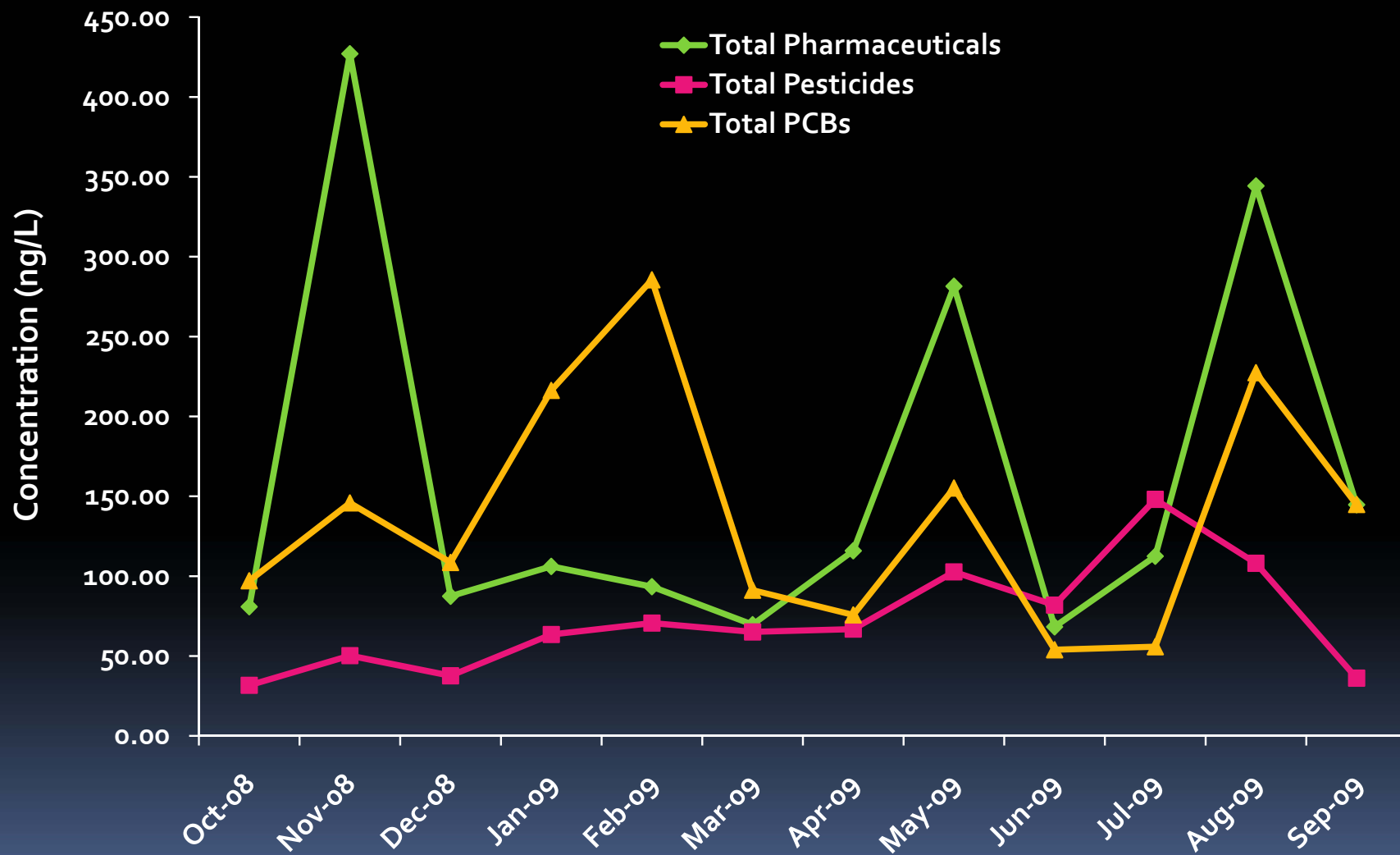
1	1,2-dibromo-3-chloropropane	16	Endosulfan I
2	Hexachloropentadiene	17	Alpha-chlordane
3	diallate	18	4,4'-DDE
4	Hexachloroben zene	19	dieldrin
5	Alpha-BHC	20	endrin
6	chlordene	21	chlorobenzilate
7	Gamma-BHC	22	Cis-nonachlor
8	Beta-BHC	23	Endosulfan II
9	Delta-BHC	24	4,4'-DDD
10	heptachlor	25	Endrin aldehyde
11	aldrin	26	4,4'-DDT
12	isodrin	27	Endosulfan sulfate
13	Heptachlor epoxide-isomer B	28	Endrin keton
14	Gamma-chlordane	29	methoxychlor
15	trans-nonachlor		



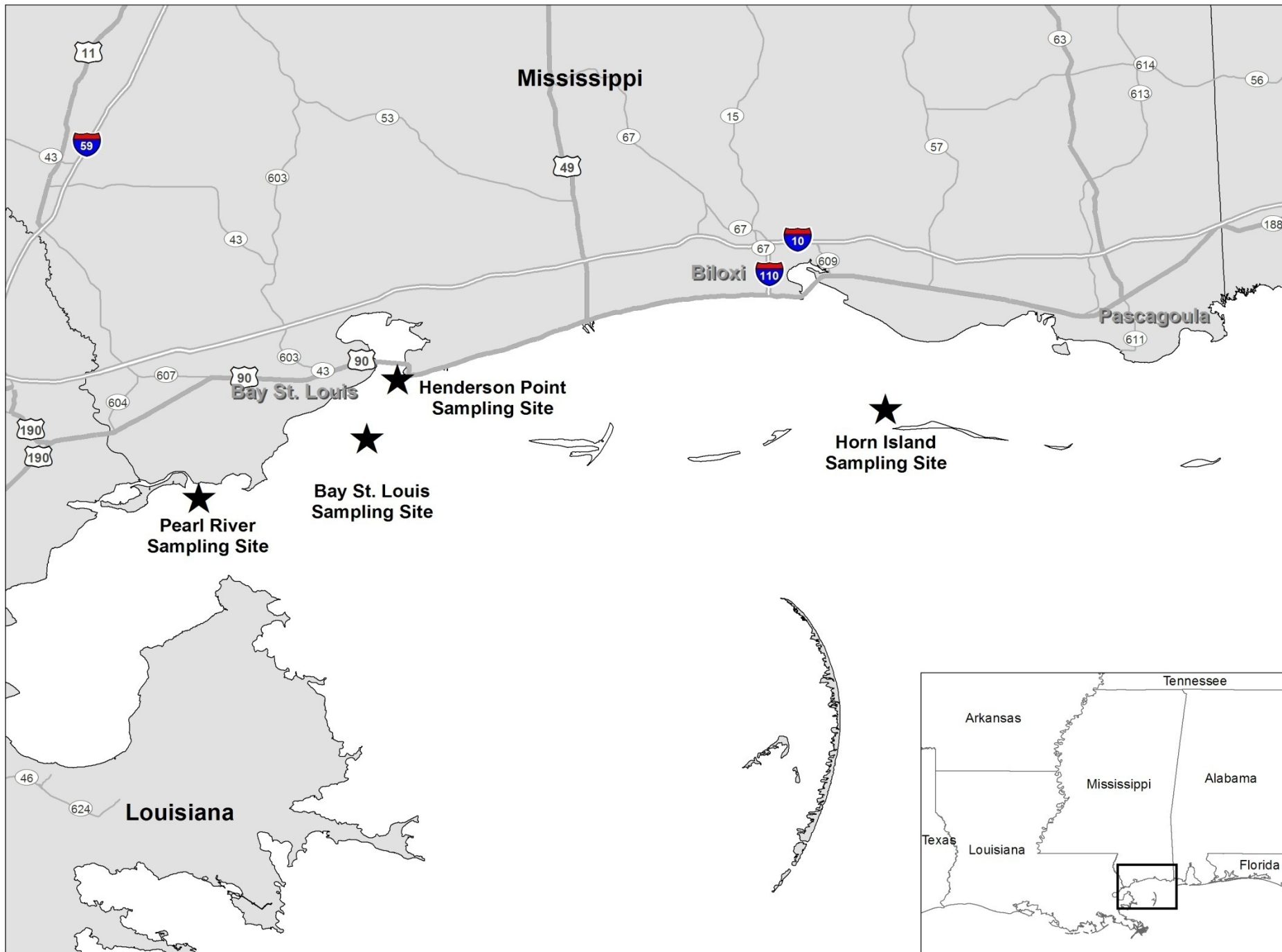
Seasonal Variations of Pharmaceuticals, Pesticides, and PCBs in Lake Pontchartrain



Seasonal Variation of Pharmaceuticals, Pesticides, and PCBs in Mississippi River



	Sewage Influent			Sewage Effluent		
	Liquid phase	Particle phase	Total	Liquid phase	Particle phase	Total
1,2-dibromo-3-chloropropane	0.00	0.00	0.00	0.00	0.00	0.00
Hexachloropentadiene	0.00	0.00	0.00	0.00	0.00	0.00
diallate	0.00	0.00	0.00	0.00	0.00	0.00
Hexachloroben zene	0.00	0.00	0.00	0.00	0.00	0.00
Alpha-BHC	0.00	0.00	0.00	0.00	0.00	0.00
chlordene	0.00	0.00	0.00	0.00	0.00	0.00
Gamma-BHC	20.39	17.54	37.93	15.19	16.90	32.09
Beta-BHC	7.75	0.00	7.75	0.00	0.00	0.00
Delta-BHC	0.00	0.00	0.00	0.00	0.00	0.00
heptachlor	0.00	0.00	0.00	0.00	0.00	0.00
aldrin	0.00	125.40	125.40	0.00	0.00	0.00
isodrin	0.00	144.46	144.46	123.42	210.04	333.46
Heptachlor epoxide-isomer B	137.23	25.07	162.29	44.41	0.00	44.41
Gamma-chlordane	0.00	59.53	59.53	0.00	5.53	5.53
trans-nonachlor	0.00	0.00	0.00	2.33	0.00	2.33
Endosulfan I	28.57	20.94	49.50	0.00	67.39	67.39
Alpha-chlordane	0.00	0.00	0.00	27.08	0.00	27.08
4,4'-DDE	61.07	58.71	119.78	0.00	0.00	0.00
dieldrin	0.00	0.00	0.00	0.00	0.00	0.00
endrin	118.85	0.00	118.85	87.79	0.00	87.79
chlorobenzilate	14.58	0.00	14.58	0.00	9.91	9.91
Cis-nonachlor	0.00	0.00	0.00	0.00	0.00	0.00
Endosulfan II	32.90	0.00	32.90	0.00	0.00	0.00
4,4'-DDD	6.24	0.00	6.24	4.72	3.90	8.63
Endrin aldehyde	0.00	70.40	70.40	6.06	0.00	6.06
4,4'-DDT	0.00	0.00	0.00	0.00	0.00	0.00
Endosulfan sulfate	0.00	10.63	10.63	0.00	0.00	0.00
Endrin keton	0.00	0.00	0.00	0.00	0.00	0.00
methoxychlor	0.00	0.00	0.00	0.00	0.00	0.00
Total organochlorine pesticides	427.57	532.67	960.25	311.00	313.69	624.69
Total PCBs (Sum of 27 congeners)	10.22	53.76	63.98	11.48	19.16	30.64
Bisphenol A	203.01	131.04	334.05	44.89	10.23	55.12
Estrone	167.3	191.69	358.99	72.73	39.14	111.87
17β-Estradiol	61.61	93.86	155.47	18.97	35.9	54.87
17α-Ethinylestradiol	18.89	27	45.89	20.63	31.09	51.72
Total EDCs	888.61	1030.02	1918.63	479.70	449.20	928.91

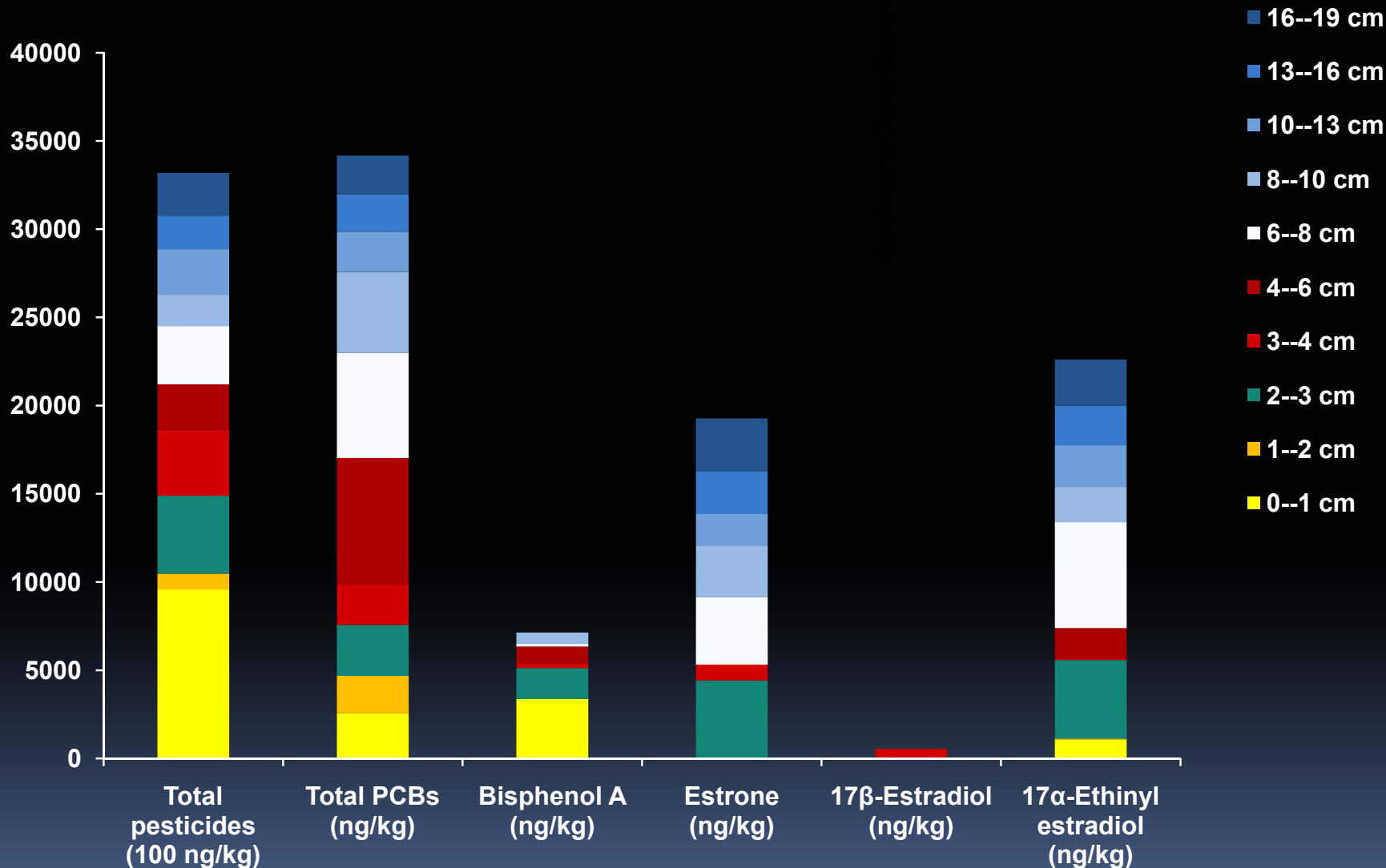


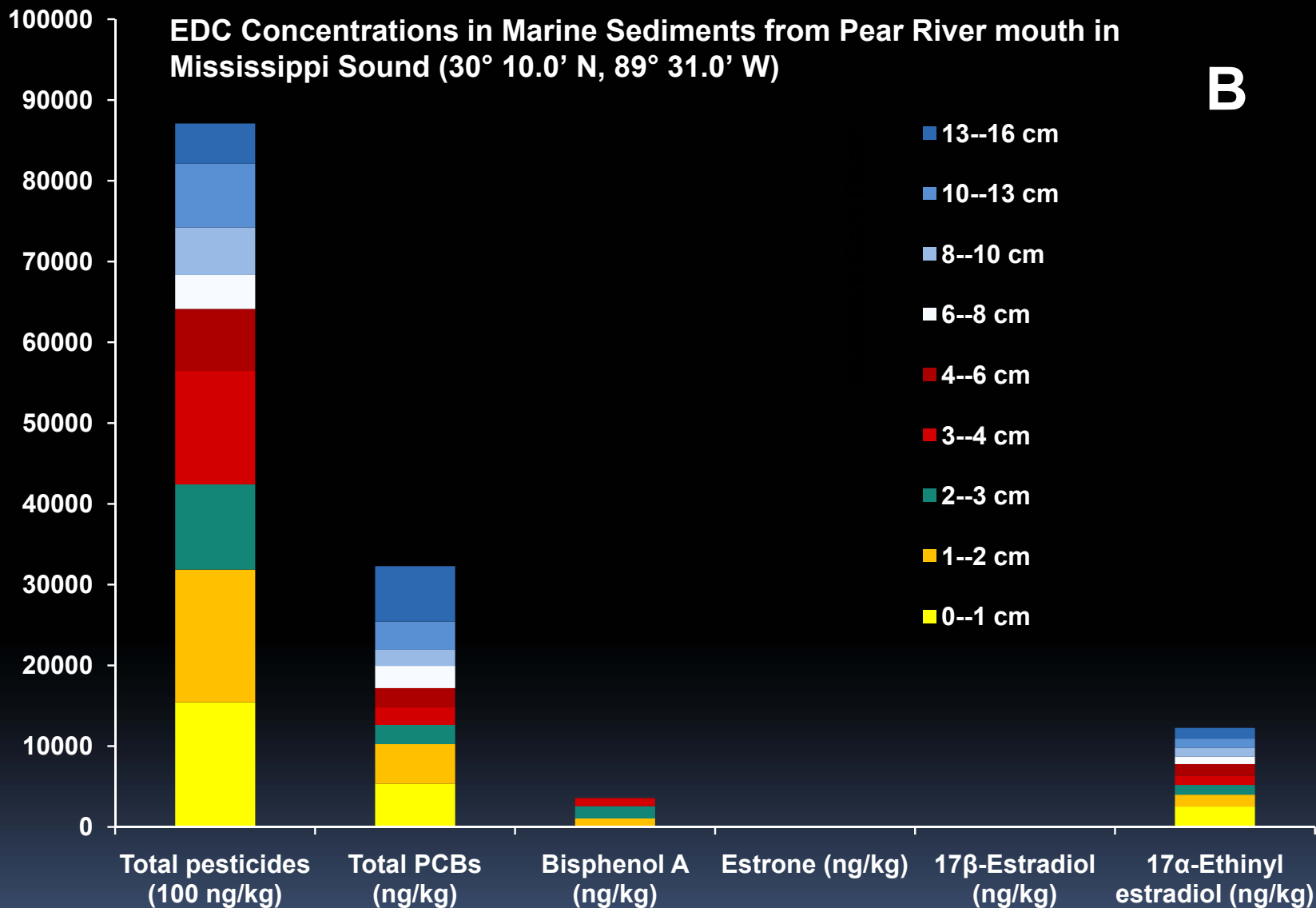
EDC concentrations (ng/L) in Gulf of Mexico ocean water

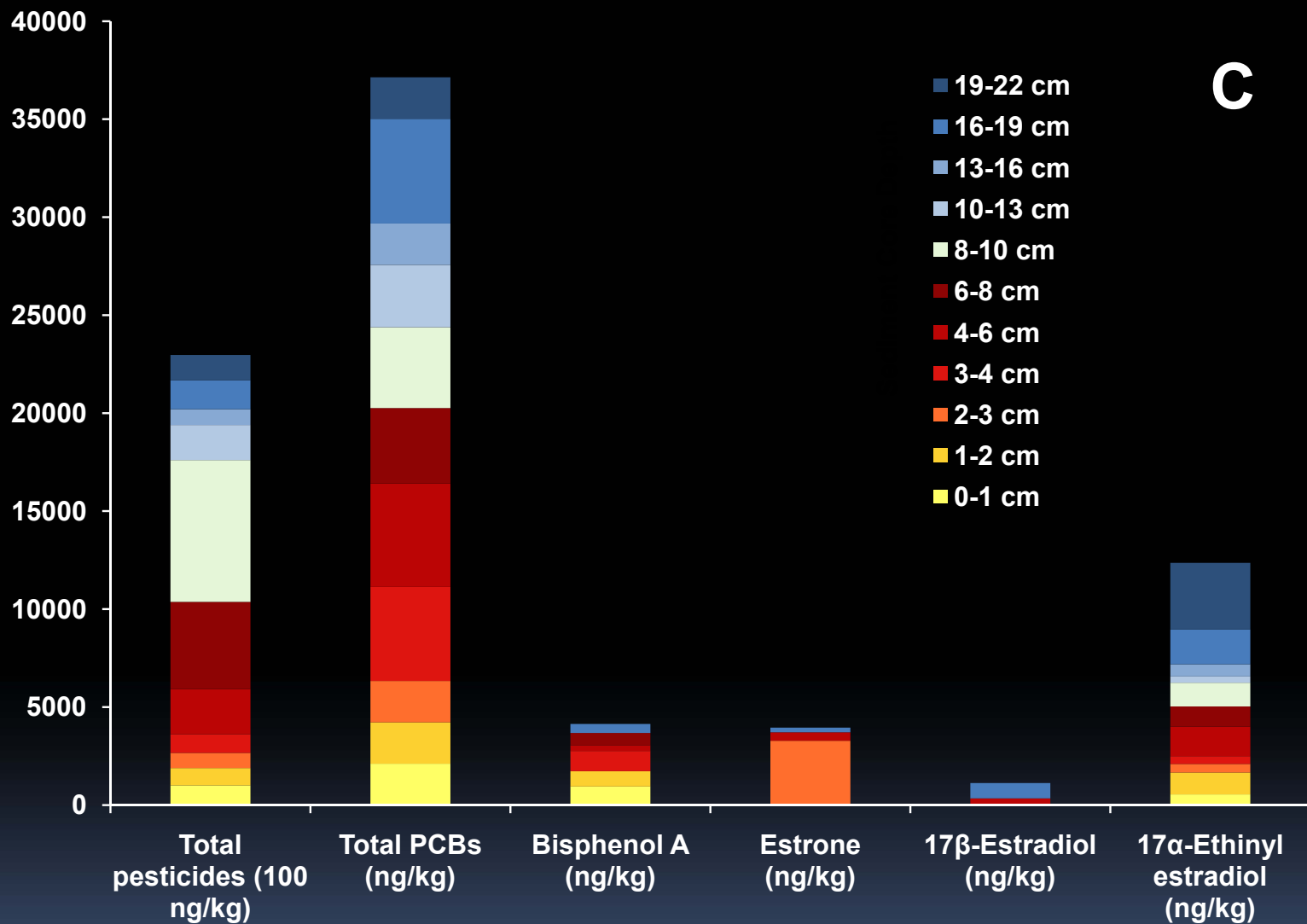
	Horn Island			Henderson Point			Pearl River Mouth			South of Bay St. Louis		
EDCs	Liquid phase	Particle phase	Total	Liquid phase	Particle phase	Total	Liquid phase	Particle phase	Total	Liquid phase	Particle phase	Total
Total organochlorine Pesticides (Sum of 29)	116.46	92.2	208.66	134.61	158.37	292.98	143.2	160.47	303.67	53.03	88.06	141.09
Total PCBs (Sum of 27 congeners)	0.16	1.25	1.41	0.21	5.55	5.76	0.26	4.17	4.43	0.24	12.56	12.8
Bisphenol A	0.49	0.31	0.8	0.13	0.67	0.8	0.16	0.7	0.86	0.31	0.15	0.46
Estrone	0	2.12	2.12	1.11	14.06	15.17	0.24	1.09	1.33	0.87	3.19	4.06
17 β -Estradiol	0	0	0	0.12	10.3	10.42	0	0	0	1.12	1.77	2.89
17 α -Ethinylestradiol	0.53	1.75	2.28	1.64	0.2	1.84	0.7	0.94	1.64	1.93	0.33	2.26
Total EDCs	117.64	97.63	215.27	137.82	189.15	326.97	144.56	167.37	311.93	57.5	106.06	163.56

EDC Concentrations in Marine Sediments from South of the Bay of St. Louis in Mississippi Sound 30° 14.0'N , 89° 20.0'W)

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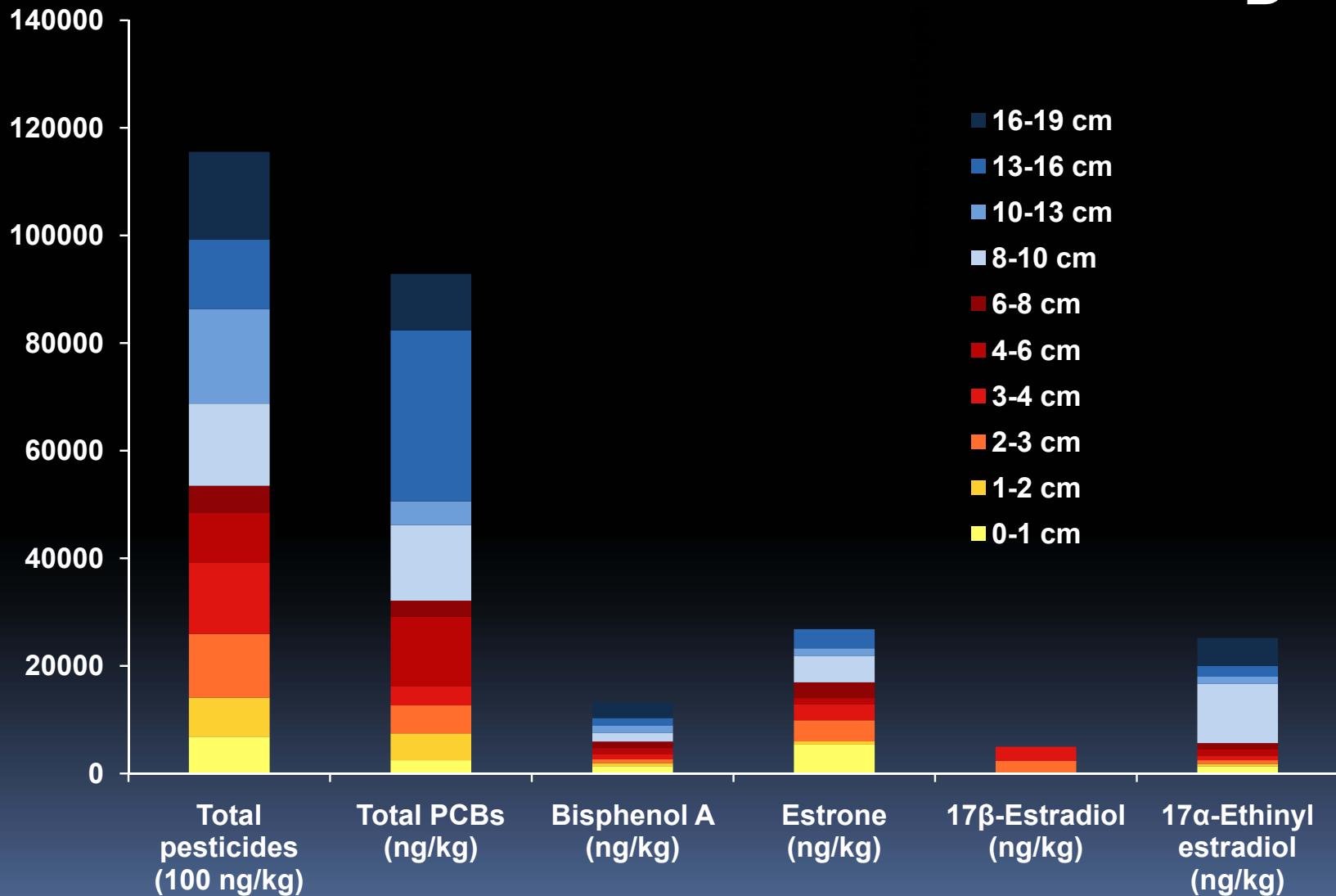




EDC Concentrations in Marine Sediments from Henderson Point in Mississippi Sound (30° 18.0' N , 89° 18.0' W)

EDC Concentrations in Marine Sediments from Horn Island in Mississippi Sound (30° 16.0' N, 88° 46.0' W)

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Summary

- ❑ Endocrine disrupting chemicals, as represented by 85 organochlorine pesticides, PCBs, and pharmaceuticals, are widely distributed in New Orleans aquatic environment.
- ❑ The concentration levels of endocrine disrupting compound varied from non detectable to hundreds of ng/L.
- ❑ Because most of the suspected endocrine disrupting chemicals exert their biological effects at low doses, there is a clear need for continued monitoring of the pollution levels