State of the Gulf: Addendum 1

Results Of Save Our Gulf Environmental Monitoring

Background

Significant levels of Total Petroleum Hydrocarbons (TPHs) and Polycyclic Aromatic Hydrocarbons (PAHs) were found in many of the samples taken during the Save Our Gulf environmental monitoring project.

TPH is defined as the measurable amount of petroleum-based hydrocarbon in an environmental media (in this case samples of water, soil and tissue). PAHs are a specific kind of hydrocarbons that occur in crude oil and can be dangerous to human health.

13 PAH's were selected by the US Food and Drug Administration (FDA) to be monitored for in seafood because they are the most studied PAH's that occur in petroleum and "reflect the potential for toxic or carcinogenic effects of the mixture of compounds present in crude petroleum."[1]

While the amounts of PAH's found in the Save Our Gulf monitoring are lower than the FDA Levels Of Concern, in developing the parameters for levels of concern (LOCs), adjustments for smaller individuals, children, and pregnant women were not taken into account. The seafood consumption rates of Gulf Coast communities also were not taken into account.[2] The FDA did not set limits for or test for any of the other hydrocarbon compounds found in crude oil.

Recent studies have shown that petroleum exposure is causing harmful biological effects in Gulf of Mexico marine organisms and it is occurring at concentrations much lower than previous scientific thinking suggested they would.[3]

The following table contains the results of 83 samples collected by Save Our Gulf Waterkeepers from St. Mary Parish, LA to Franklin County, FL.

The table shows concentrations of the 13 PAHs selected by FDA (Napthalene, Fluorene, Anthracene&Phenanthrene, Pyrene, Fluoranthene, Chrysene, Benzo[k]fluoranthene, Benzo{b} fluoranthene, Benz[a]anthracene, Indeno[1,2,3-cd]pyrene, Dibenz[a,h]anthracene, and Benzo[a] pyrene), the total level of PAHs found and 4 different ranges of TPH analyses found in each sample.

The monitoring project was conducted under the direction of award-winning chemist Wilma Subra and analyzed at EPA certified commercial laboratories.

All PAH results are in *µ*g/kg (micrograms per kilogram) all TPH results are in PPM (parts per million).

Table Of Sampling Results

Sample ID	Location	Collection Date	Sample Type	Napthalene	Fluorene	Anthracene / Phenanthrene	Pyrene	Fluoranthene	Chrysene	Benzo[k]fluoranthene	Benzo[b]fluoranthene	Benz[a]anthracene	Indeno[1,2,3-cd]pyrene	Dibenz[a,h]anthracene	Benz[a]pyrene	Total PAH	TPH C10 - C28 (ppm)	TPH C12 - C36 (ppm)	TPH C11 - C60 (ppm)	TPH C28 - C40 (ppm)
1	FL	6/14/10	Oyster	0.98				0.38								1.36	13.3	179.2		
2	FL	6/14/10	Oyster	3.67		1.78	4.44	4.6								14.49	61.9	327.8		
3	FL	6/14/10	Oyster	3.13			0.47	0.65								4.25	9	100.8		
4	FL	6/14/10	Oyster			1.47	1.89	3.07				0.44				6.87	22.5	158.5		
5	FL	6/14/10	Oyster	0.79		5.45	2.12	2.96				1.21				12.53	19.7	204.5		
6	FL	6/14/10	Oyster	0.87			0.44	0.64								1.95	13.3	122.7		
7	FL	6/14/10	Oyster	1.63												1.63	8.4	81.3		
11	LA	8/2/10	Crab														729	1190	2230	
13	LA	8/2/10	Oysters			16										16	1146	2996		
14	LA	8/2/10	Oysters																8815	
16	LA	8/2/10	Mussel	185		186										386	1189	2826	6900	
17	LA	8/3/10	Oyster			63										63	1088	3252	12500	
20	FL	8/9/10	Oyster			0.73	0.57	1	0.8							3.1	6.7	170.7		
21	LA	8/12/10	Shrimp			17										17	2096	4450	8356	
22	LA	8/12/10	Fish			13										13	5241	7836	11800	
23	LA	8/12/10	Fish														3817	4929	21600	
24	LA	8/12/10	Fish														2461	3300	6028	
26	LA	8/19/10	Gull Viscera														13771	17691	23000	
27	LA	8/19/10	Crab			162										162	1181	1883	3583	
28	LA	8/19/10	Fiddler Crabs and Snails			12										12	3961	5129	6916	
29	FL	9/30/10	Oyster			2.89	2.17	3.45	1.89			0.62				11.02	20.4	555.3		
30	FL	10/1/10	Oyster						1.15							1.15	8.1	206.5		
31	FL	10/1/10	Oyster			3.45	6.92	13.6	1.65			0.46				27.07	85	1878		
32	LA	10/8/10	Crab	1.4		1.7	0.8	0.8								4.7	11.1	387.8		
33	LA	10/8/10	Snail	3.5		1.7	0.7	0.8								6.7	8.5	171.4		
34	FL	10/10/10	Oyster			4.53	4.11	8.65	2.56			0.51				21.32	45.1	378.6		
35	FL	10/10/10	Oyster														0.7	71.2		
37	LA	10/26/10	Oyster	3.1		0.5										3.6	10.5	312.4		
38	LA	10/26/10	Shrimp	2.6		3.4	1.1	1.9								69.4	15.9	882.8		
39	LA	10/26/10	Oyster														16.5	325.4		
40	LA	10/26/10	Crab				0.6	0.6								84.6	10.7	424.9		
49	LA	11/8/10	Oyster	0.9		0.5	0.4	0.7								2.5	18.1	318.8		
50	LA	11/8/10	Oyster	1.4												1.4	19.6	245.7		
52	LA	11/8/10	Crab	218												218				

53	FL	11/10/10	Soil			169		1218	1195						4609				1410
54	LA	11/18/10	Fish			17		10							27			53	
55	LA	11/18/10	Crab	88											88				
56	LA	11/22/10	Oyster	80											80			13	
57	LA	11/23/10	Shrimp	123											123				
58	LA	11/23/10	Fish												10				
59	LA	11/23/10	Fish	69											81			55	
60	LA	11/23/10	Mussel	68											78			20	
61	LA	11/23/10	Crab	73											73			17	
62	FL	12/21/10	Oyster	1.08		0.31	0.68	0.27							2.34	17.3	116.2		
63	FL	12/21/10	Oyster		0.47										0.58	13.2	88.5		
64	FL	12/21/10	Oyster	2.56		0.37									2.92	19.6	124		
65	FL	12/21/10	Oyster	4.44		0.93		0.99							6.36	14.4	81.9		
66	FL	12/21/10	Oyster	2.98		0.5	0.99	0.35							4.82	13.1	70.4		
67	FL	12/21/10	Oyster	0.55			0.85					0.62			2.02	60.7	126.3		
68	FL	12/21/10	Oyster				0.58								0.58	7.5	69.3		
69	FL	12/21/10	Oyster	0.54											0.54	9.4	100.8		
70	LA	1/28/11	Oyster	24.7		9.8	0.5								35	13.1	47.7		
73	FL	3/16/11	Oyster		9.98	1.94	1.74	3.23							16.89	10.9	76.3		
74	FL	3/17/11	Oyster	19.4	57.9	67.1	30.9	74	15.7	1.32	6.87	4.19		0.78	287	52.3	91.9		
75	FL	3/18/11	Oyster	3.74	17.7	3.76	11.2	25.7	1.98						70.87	13.9	63		
76	FL	3/18/11	Oyster	0.67	13.4	3.82	1.88	3.55	1.17						24.8	9.1	70.1		
77	FL	3/18/11	Oyster		14.1	1.56	0.84	1.49	1.17						19.14	9.4	114		
78	FL	3/18/11	Oyster		15.5	6.48	2.06	6.13	0.87						31.43	9.2	65.4		
82	AL	5/10/11	Soil		24.6	28.9									53.5				
83	AL	5/10/11	Water					0.12							0.161				

Notes

1. United States Food and Drug Administration. *Protocol for Interpretation and Use of Sensory Testing and Analytical Chemistry Results for Re-Opening Oil-Impacted Areas Closed to Seafood Harvesting Due to The Deepwater Horizon Oil Spill*. 2010. Web. <http://www.fda.gov/Food/ucm217601.htm>.
2. Solomon, Gina. "Assessment of Gulf Seafood Safety Needs to Protect Vulnerable Populations." *Switchboard*. NRDC, 17 AUG 2010. Web. <http://switchboard.nrdc.org/blogs/gsolomon/flawed_assessment_of_gulf_seaf.html>.
3. Whitehead et al. "Genomic and physiological footprint of the Deepwater Horizon oil spill on resident marsh fishes." *Proceedings Of The National Academy Of Sciences of the United States of America*. (2011). Web. 26 Sept. 2011. <http://www.pnas.org/content/early/2011/09/21/1109545108.full.pdf html>.