

# Oil Spill Sampling by Sarasota County

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The Deepwater Horizon oil drilling platform exploded on April 20 in Louisiana almost 350 miles from Sarasota. The largest oil spill in U.S. history was ended after 3 months when the well was capped on July 15, but after 185 million gallons of oil had been spilled. About one quarter was captured, one quarter was evaporated or dissolved, one quarter was dispersed into Gulf waters and the remaining quarter exists as a sheen or is entrained in sediments<sup>1</sup>. The oil is reportedly degrading quickly. In Florida, only the westernmost, panhandle beaches near Pensacola had any documented oil from this spill. The oil rig was drilling the deepest oil well in history and was operating in 5,000 feet of water. Water that deep is far from Sarasota County, about 150 miles west. Mixing of deep and shallow water is uncommon and circulation models predict that oil will not come here.

In our area, various agencies conducted sampling. In addition to the large interagency effort, Sarasota County Environmental Services sampled water, sediment, oyster tissue and air. The purpose of the project was to characterize the background levels of contaminants. It was expected that some petroleum would be found because of routine usage by the large number of boats (22,000) and cars (400,000) registered in the County. The laboratory methods are acutely sensitive and can detect at a “parts per billion” (ppb) level. A part per billion would be one drop of oil in an area of sand about 100 feet long by 10 feet wide by one foot deep.

Sarasota County Water Resources took samples from water and sediment on the beaches and oyster tissue near the mouths of creeks. Samples were analyzed for polycyclic aromatic hydrocarbons (PAHs), a group of 18 pollutants found in crude oil that are known to have human health and environmental effects. The entire length of the County beaches was sampled (26 locations) on July 22 for both water and sediment. All 16 creeks had oyster tissue sampling completed by September 15. Oysters were chosen because they eat by filtering particles from the water and incidentally accumulate contaminants in their tissues, so are a good indicator species.

As expected, the beach samples were found to be very clean with 25 of 26 locations at undetectable levels. One sediment sample near Venice had barely detectable concentrations. These levels are well below the standards for impacts to human health<sup>2,3</sup> and aquatic life<sup>4</sup>. These results are consistent with interagency sample results<sup>5</sup> that showed our region had a small number of samples with low but detectable levels of PAHs, including two sites in Sarasota County.

The oyster samples exhibited low levels of PAHs probably from petroleum in runoff or from boating. Among the samples that were above the detection limit the concentrations ranged from 0.14 to 42 ppb. Samples were generally higher in more urbanized areas as shown in Figure 7. The levels were comparable to what was found in a 1992 study of Sarasota Bay<sup>6</sup> that reported samples results between 15 and 50 ppb. Florida oyster samples from the NOAA Mussel Watch program<sup>7</sup> from 1989-2001 are higher than the local samples with a median of 6.3 compared to the local median of 1.3 ppb.

The Sarasota County Air Quality Program took ambient air samples at two coastal locations. The north station at Lido Beach and the south station on Manasota Beach provided representative coverage county-wide. Sampling was performed on a 1 in 6-day sampling regime from July 19 through August 2. Sampling parameters were consistent with the air quality sampling plans implemented for the oil spill by the Environmental Protection Agency and the Florida Department of Environmental Protection. The results of the air monitoring documented low levels of volatile organic compounds at both sampling locations. The levels recorded were consistent with levels documented by the FDEP previous to the oil spill and are well below levels that are considered a health risk<sup>8</sup>.

This comprehensive, local sampling initiative was performed to protect the citizens and resources of the County. If BP oil had come here, this strong set of background data would have been compared to data from oil-impacted areas to make a compelling case for BP's responsibility. In the absence of oil spill impacts, the data shows us that our community is remarkably free of these common pollutants and reminds us to continue with our successful environmental protection and enhancement programs. Persons who think they see petroleum or other contamination in the coastal environment are strongly encouraged to report it to the National Response Center at 800-424-8802 or online at [www.nrc.uscg.mil](http://www.nrc.uscg.mil).

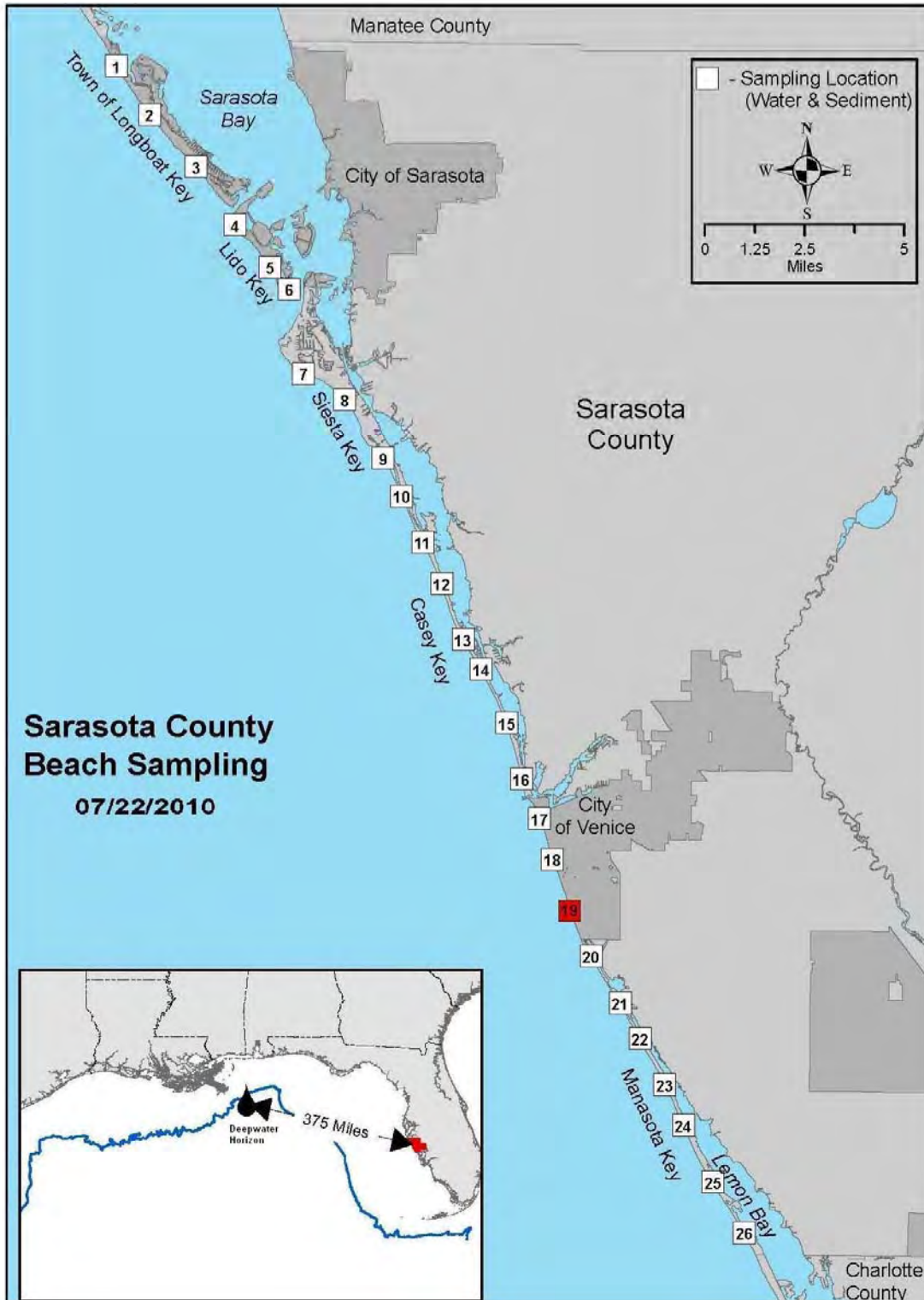


Figure 1: Beach Sample Locations by Sarasota County Water Quality Planning.



Figure 2: Scientist collecting sediment samples from the beach intertidal zone on July 22, 2010.



Figure 3: A County scientist preparing to sample the water quality of the Gulf of Mexico.

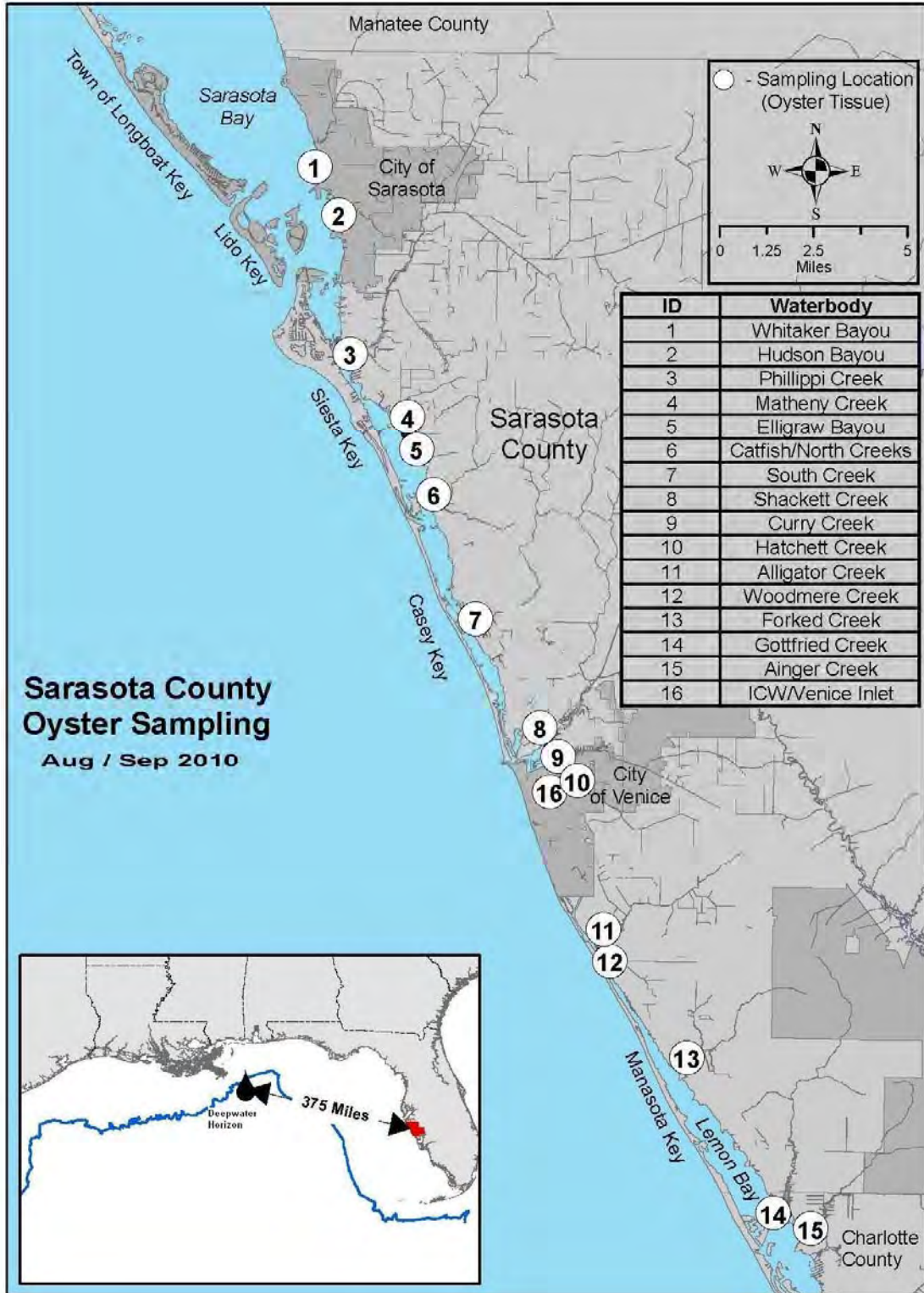


Figure 4: Oyster sample locations in the County's creeks.



Figure 5: A healthy oyster reef in Phillippi Creek.



Figure 6: County scientists sampling oysters.

**Table 1: Background PAH Results for Sarasota County – Compared to Standards (ppb)**

	Results for 26 sites	Results for 25 sites	Site 19		Standard	Standard	Standard	Results	Results
PAH	Beach Water	Beach Sand	Beach Sand	Limit of Lab Method	Human Health – Beach Sand - DOH <sup>1</sup>	Aquatic Life (Chronic) Sediment EPA <sup>3</sup>	Residential Soil Cleanup Target Level – DEP <sup>2</sup>	DEP Sample 6 – South Lido <sup>4</sup>	DEP Sample 5 - Dona Bay <sup>4</sup>
Acenaphthene	None detected	None detected	4.3	4.1	3,400,000	491,000	2,400,000	NA	NA
Acenaphthylene	None detected	None detected	None detected	4.9	No standard	452,000	1,800,000	NA	NA
Anthracene	None detected	None detected	5.2	2.5	17,000,000	594,000	21,000,000	NA	NA
Benzo(a)anthracene	None detected	None detected	9.2	3.7	150	841,000	No standard	NA	12
Benzo(a)pyrene	None detected	None detected	5.2	4.5	15	965,000	100	NA	21
Benzo(b)fluoranthene	None detected	None detected	5.6	2.9	150	979,000	No standard	NA	38
Benzo(g,h,i)perylene	None detected	None detected	4.3	3.8	No standard	1,090,000	2,500,000	NA	25
Benzo(k)fluoranthene	None detected	None detected	None detected	6.1	1,500	981,000	No standard	NA	NA
Chrysene	None detected	None detected	5.9	3.7	15,000	844,000	No standard	NA	20
Dibenz(a,h)anthracene	None detected	None detected	None detected	4.4	15	1,120,000	No standard	NA	NA
Fluoranthene	None detected	None detected	5.7	4.6	2,300,000	707,000	3,200,000	NA	26
Fluorene	None detected	None detected	5.0	3.1	2,300,000	538,000	2,600,000	NA	NA
Indeno(1,2,3-cd)pyrene	None detected	None detected	4.8	4.4	150	1,110,000	No standard	NA	21
1-Methylnaphthalene	None detected	None detected	None detected	5.2	22,000	No standard	200,000	NA	NA
2-Methylnaphthalene	None detected	None detected	None detected	5.7	310,000	No standard	210,000	NA	NA
Naphthalene	None detected	None detected	None detected	4.4	3,600	385,000	55,000	NA	NA
Phenanthrene	None detected	None detected	6.8	3.9	17,000,000	596,000	2,200,000	NA	NA
Pyrene	None detected	None detected	5.5	5.0	1,700,000	697,000	2,400,000	NA	21
2,6-Dimethylnaphthalene	NA	NA	NA	NA	No standard	No standard	No standard	9.9	22

### Median PAHs In Sarasota County Oysters 2010

Median for NOAA Mussel Watch Samples in Florida is 15.8

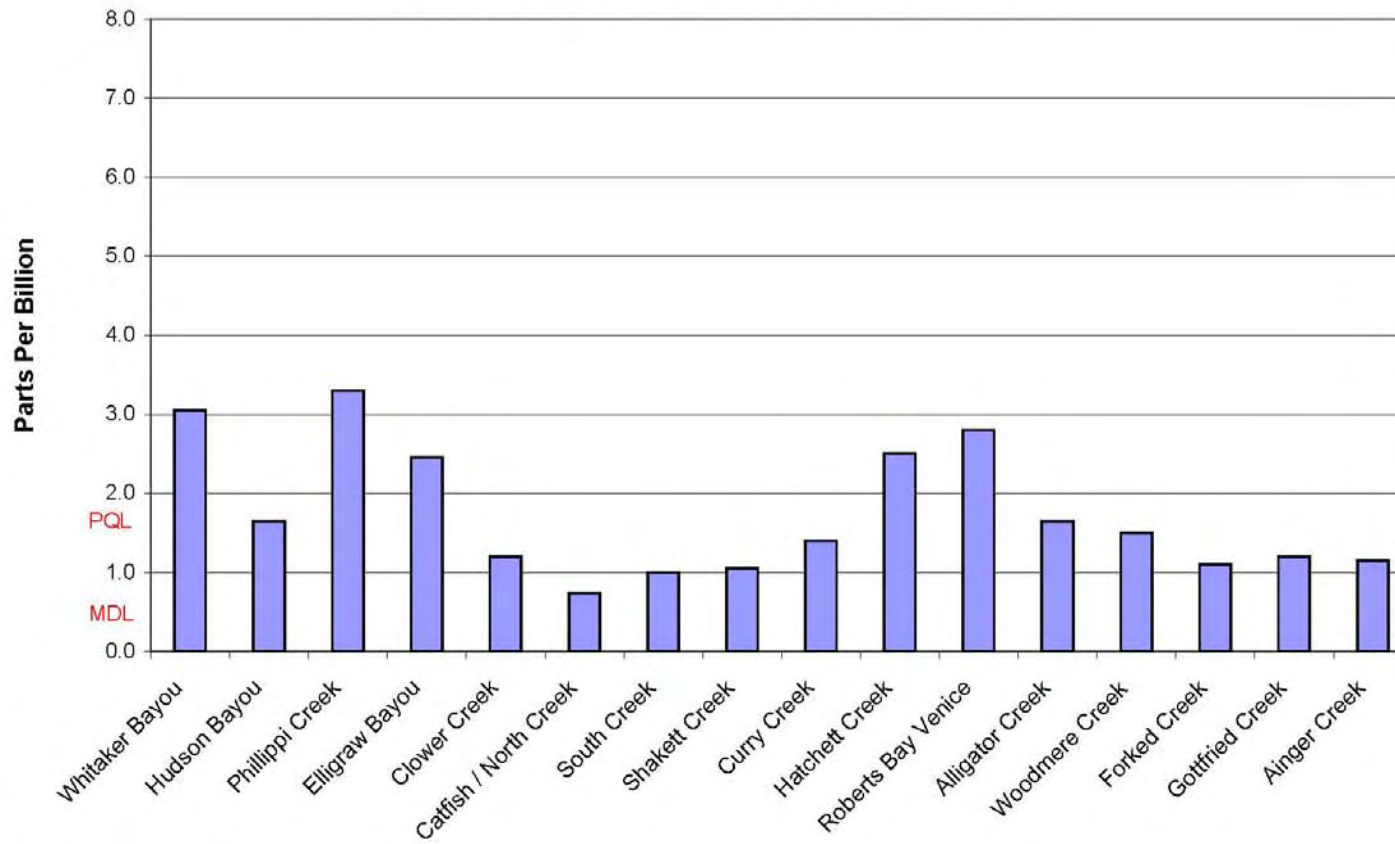


Figure 7: Oyster Tissue Results



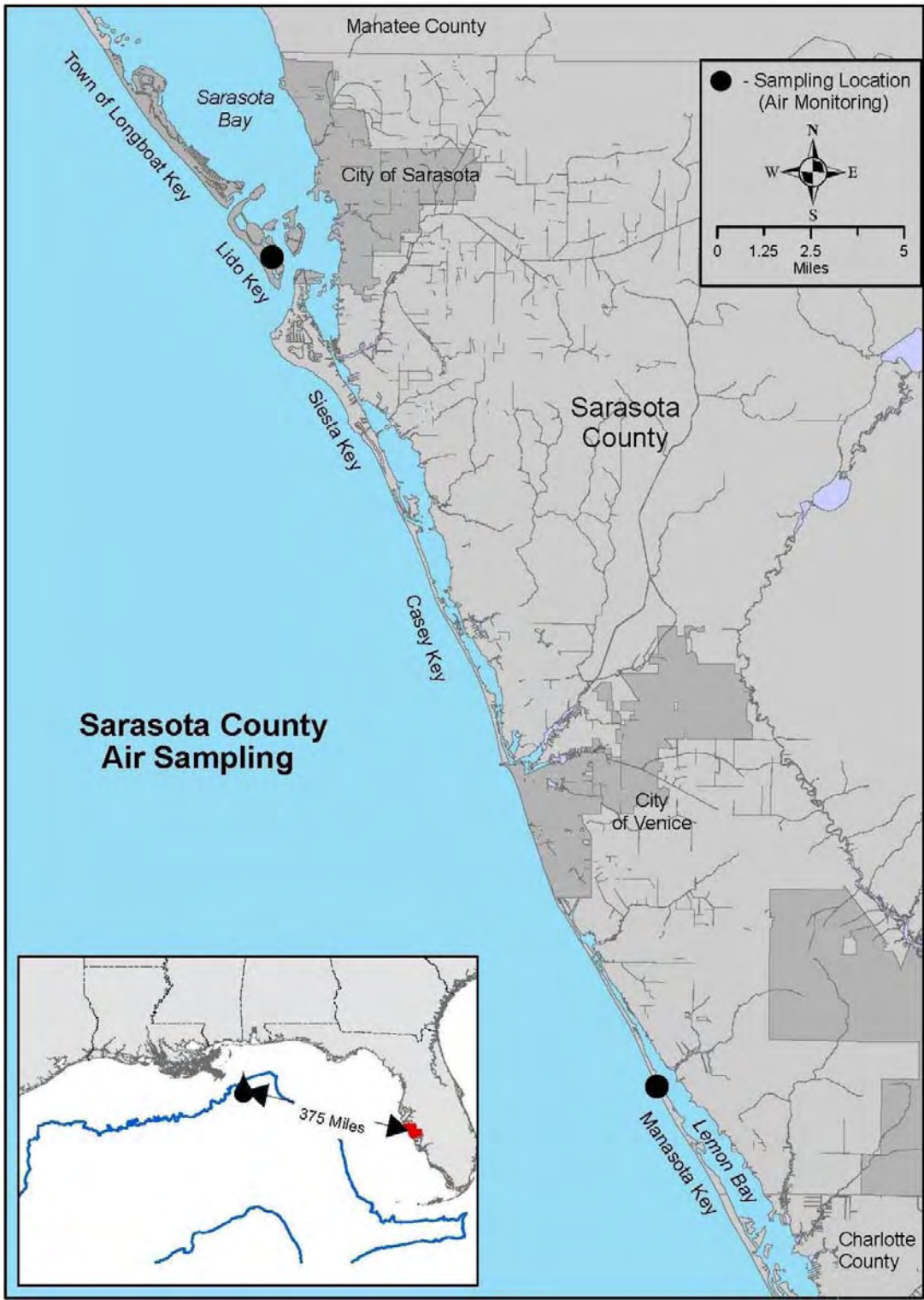


Figure 8: Ambient air sampling locations.

Table 2. Background Ambient Air Results for Sarasota County Compared to EPA Screening Levels

Chemical	Screening Level (ppb)*	Average Concentration (ppb)	Concentration Range (ppb)
Benzene	9	0.172	0.098 - 0.422
Ethyl benzene	10,000	0.055	0.025 - 0.119
Toluene	1,000	0.372	0.118 - 1.120
m,p-Xylene	2,000	0.140	0.050 - 0.406
o-Xylene	2,000	0.051	0.023 - 0.141

\* Screening levels were developed by EPA toxicologists. It is a level of pollution in the air that is below what we expect to cause health problems from short-term exposure of less than one year. The chemicals on this table are among the most toxic compounds that would be found in the air near the oil.



Figure 9: Ambient air monitoring equipment at the Lido Beach station.

## Acknowledgements

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## References

1. NOAA Report: BP Deepwater Horizon Oil Budget: What Happened To the Oil?  
[http://www.noaaews.noaa.gov/stories2010/PDFs/OilBudget\\_description\\_%2083final.pdf](http://www.noaaews.noaa.gov/stories2010/PDFs/OilBudget_description_%2083final.pdf)
2. Human Health-Based Screening Levels for Petroleum Products Impacting Gulf Coastal Waters and Beach Sediments, Florida Department of Health 2010  
[www.dep.state.fl.us/deepwaterhorizon/files/screening\\_levels092710.pdf](http://www.dep.state.fl.us/deepwaterhorizon/files/screening_levels092710.pdf)
3. Chapter 62-777 Florida Administrative Code, Contaminant Cleanup Target Levels, Table II Soil Cleanup Target Levels, Direct Exposure Residential  
[http://www.dep.state.fl.us/waste/quick\\_topics/rules/documents/62-777/TableIIsoilCTLs4-17-05.pdf](http://www.dep.state.fl.us/waste/quick_topics/rules/documents/62-777/TableIIsoilCTLs4-17-05.pdf)
4. EPA Water Quality Benchmarks for Aquatic Life  
<http://www.epa.gov/bpspill/water-benchmarks.html>
5. Florida Department of Environmental Protection Deepwater Horizon Data  
[http://www.dep.state.fl.us/deepwaterhorizon/files/071610\\_scribe\\_guidance.pdf](http://www.dep.state.fl.us/deepwaterhorizon/files/071610_scribe_guidance.pdf)
6. Bivalved Shellfish of Sarasota Bay: A Framework for Action; Mote Marine Technical Report No. 264, Dixon, 1992.  
<https://dspace.mote.org:8443/dspace/bitstream/2075/50/1/264.pdf>
7. NOAA Mussel Watch Database  
<http://ccma.nos.noaa.gov/about/coast/nsandt/welcome.html>
8. EPA Ambient Air Quality Screening Levels  
<http://www.dep.state.fl.us/deepwaterhorizon/air.htm>