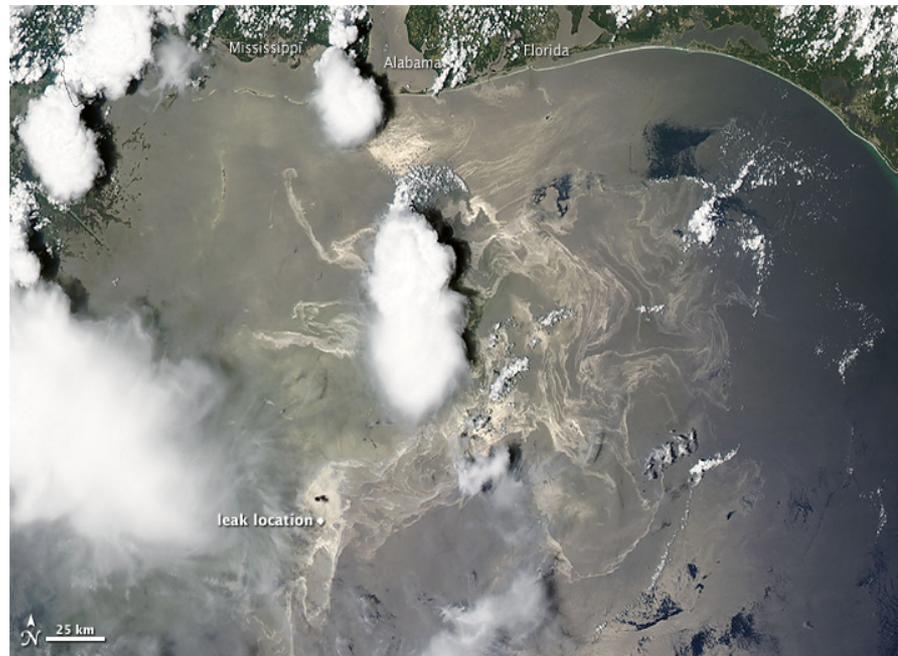




BP Oil Spill EPA's Environmental Monitoring





Environment Monitoring

- To assess any health threats or major environmental challenges, EPA's primary role is monitoring:
 - Air
 - Water
 - Sediment
- www.epa.gov/bpspill





Environmental Monitoring - Air

- **Objective:** Monitoring for by-products from controlled burns and from evaporating oil or dispersant.
- **Analytes:** particulates, VOCs, SVOCs, dispersants
- **Results:** Observed nothing exceeding normal air conditions for that time of year.





Environmental Monitoring – Air



- AreaRaes are used for investigating odor complaints and to establish baseline data.



- Trace Atmospheric Gas Analyzer (TAGA) vehicles are used to obtain Volatile Organic Carbon (VOC) readings.



- The Airborne Spectral Environmental Collection Technology (ASPECT) plane is used for aerial imagery and monitoring of shoreline and controlled burns.



- Summa canisters are used to obtain air toxic information (air sampling)



Environmental Monitoring – Water and Sediment

- **Objective:** Establishing pre-spill sediment and water quality conditions and comparing them to results found through recovery efforts.
- **Locations:** Sampling along the shoreline and near the shoreline at existing sample locations from EPA's National Coastal Assessment and other identified targeted locations.





Environmental Monitoring – Water and Sediment

- **Analytes:**
 - **Constituents of Oil**
 - PAHs/VOCs/SVOCs
 - Metals (Nickel and Vanadium)
 - **Constituents of Dispersants**
 - Bis(2-ethylhexyl) sodium sulfosuccinate
 - Propylene glycol
 - 2-Ethylhexanol
 - Ethylene glycol monobutyl ether
 - 1-(2-Butoxy-1-methylethoxy)-2-propanol





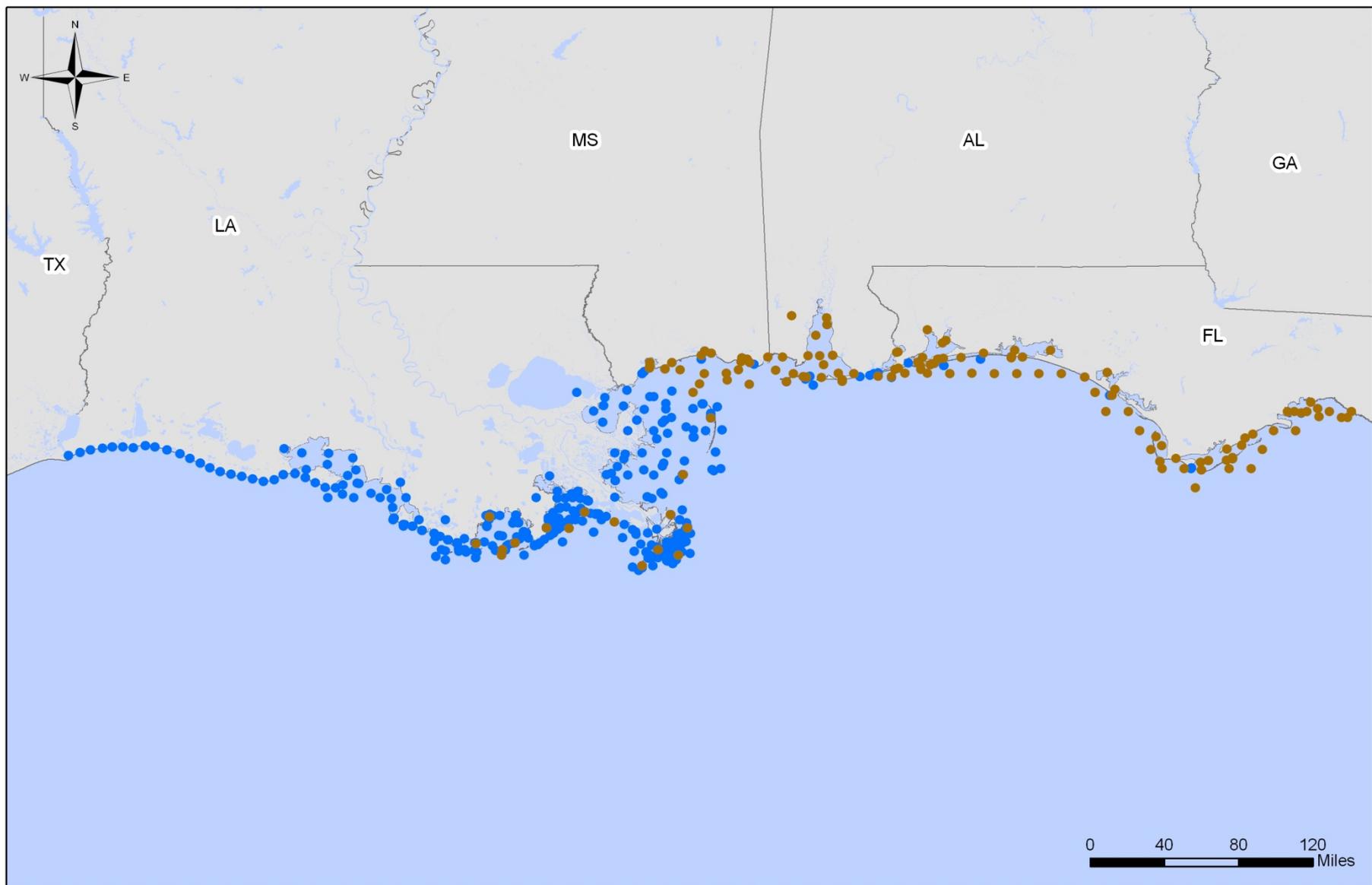
Dispersant Use

- Purpose
 - Breaks down the oil and speeds its natural degradation
 - May be less toxic than oil
 - Dispersants degrade quickly (within weeks)
- BP Spill Issues
 - First time sub-surface application
 - Largest volume ever applied
 - Dispersant evaporation and migration



Dispersant Use

- BP was limited to 15,000 gallons of undersea dispersant per day and was only permitted to use that with rigorous monitoring of environmental conditions below the surface.
 - Subsurface oxygen and toxicity remained at stable and viable levels
 - Air monitoring near shore detected only very small amounts of compounds that are well below anything likely to harm public health or the environment. And – because these compounds are common in cleaning products and coatings – it is difficult to know for sure if the small amounts detected are related to the spill.
 - EPA Corexit 9500 toxicity tests indicated that it is one of the least toxic dispersants to small fish.



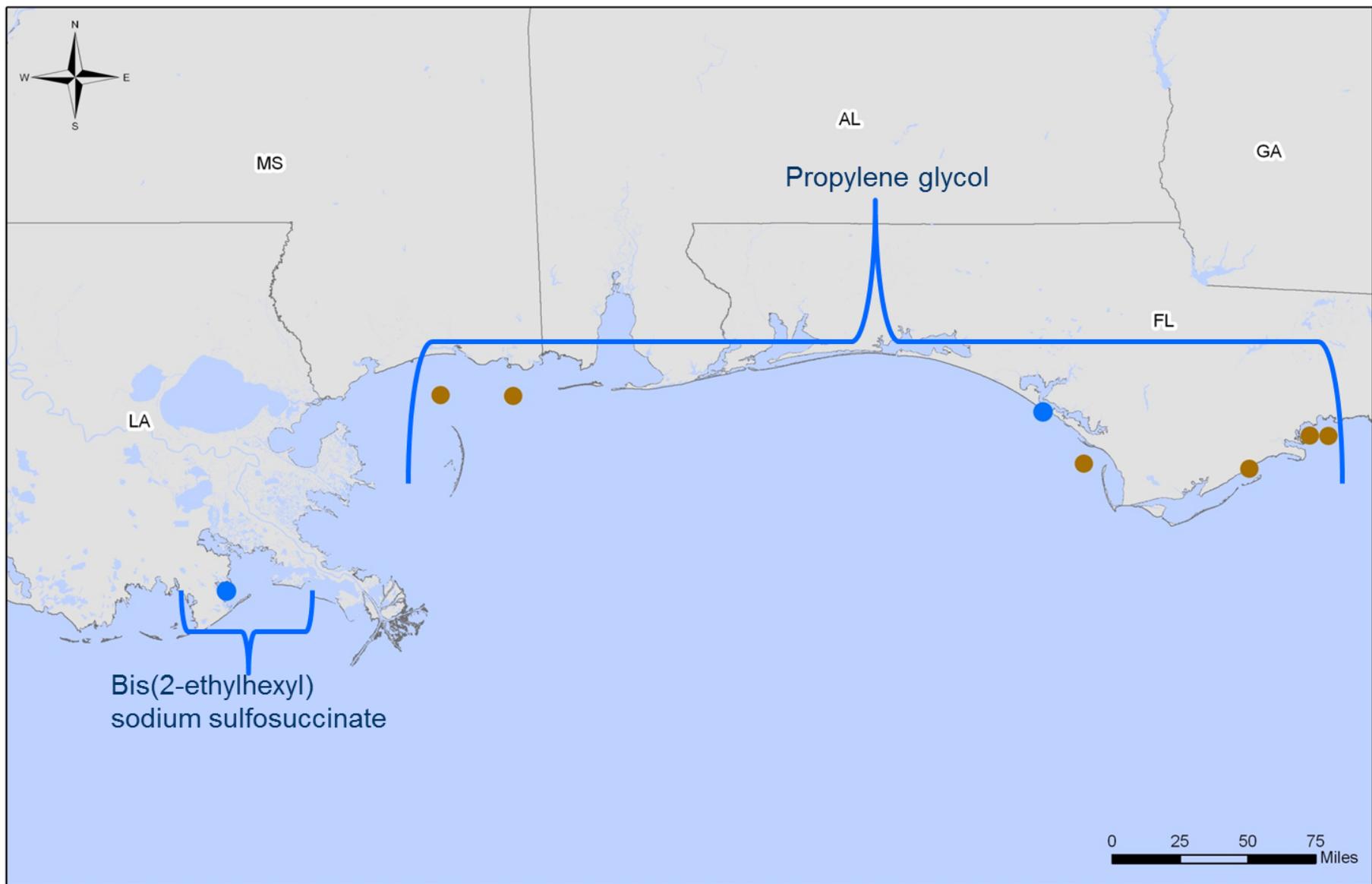
Legend

- Surface Water Sample
- Sediment Sample

BP Oil Spill Response Dispersant Sampling Locations April 30, 2010 - September 29, 2010



Data Sources: EPA and ESRI



Legend

- Dispersant Detected in Surface Water
- Dispersant Detected in Sediment

**BP Oil Spill Response
Dispersant in Surface Water and Sediment
April 30, 2010 - September 29, 2010**



Data Sources: EPA and ESRI



Water and Sediment Benchmarks – Aquatic Life

- Polycyclic aromatic hydrocarbons (PAHs)
 - 41 PAHs relevant to the BP Oil Spill
 - Because these PAHs have similar effects on organisms, EPA is taking a composite approach to assessing their potential hazard.
 - <http://www.epa.gov/bpspill/water-benchmarks.html>
- Metals
 - EPA developed benchmarks for 2 metals, nickel and vanadium, associated with the BP Oil Spill
- Dispersants
 - EPA developed benchmarks for three of the constituents found in dispersants: propylene glycol, 2-Butoxyethanol, Dioctylsulfosuccinate sodium salt
 - <http://www.epa.gov/bpspill/dispersant-methods.html>



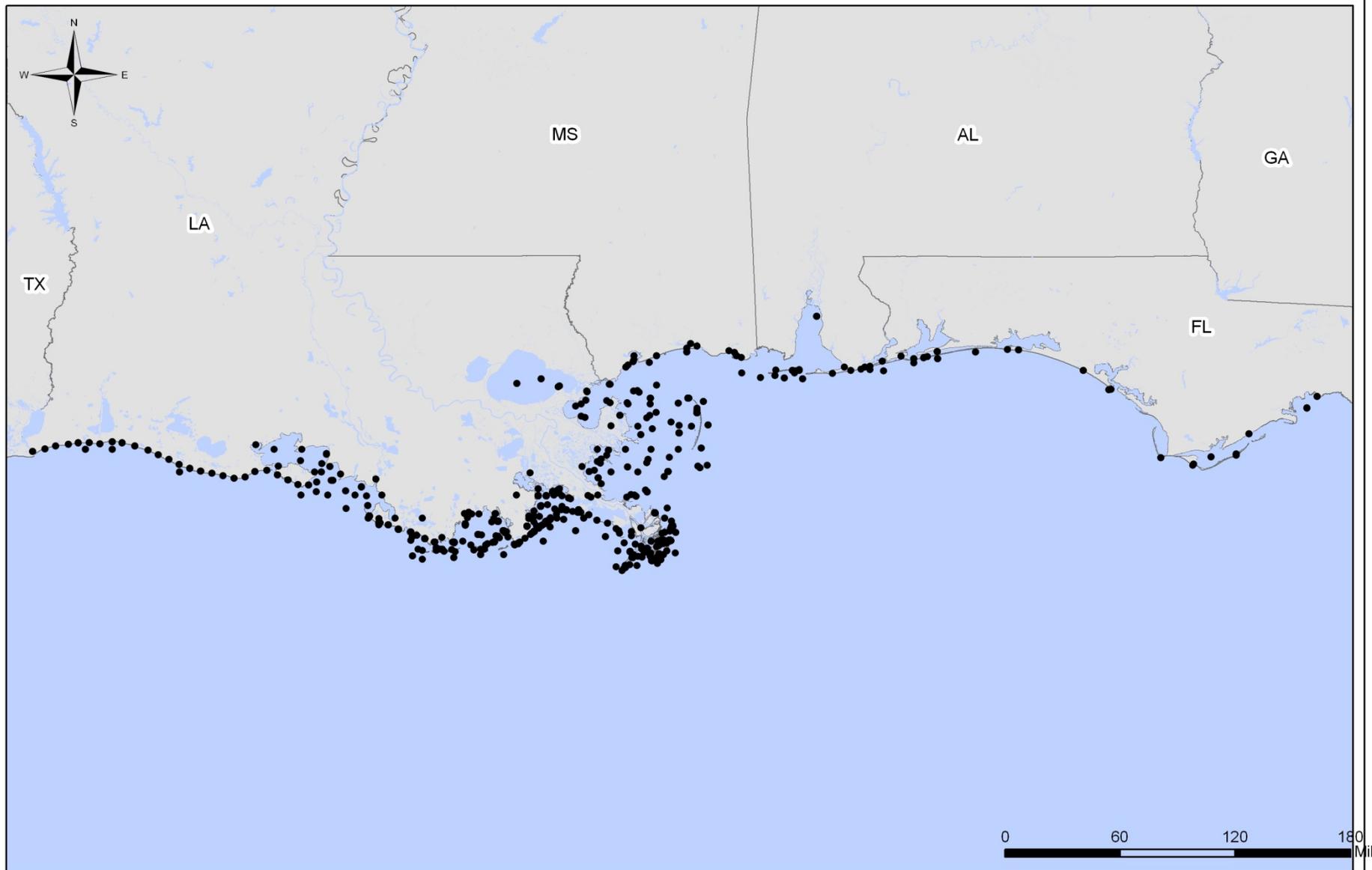
Water Benchmarks – Human Health

- Human health benchmarks are based on potential cancer and non-cancer risks associated with exposure to oil-contaminated water in the Gulf.
- Where applicable, the benchmarks account for both skin contact and incidental ingestion of water by a child swimmer, assuming 90 hours of exposure.
 - 5 VOCs, 1 SVOCs, 5 PAHs
- <http://www.epa.gov/bpspill/health-benchmarks.html>
- **No samples exceeded Human Health Benchmarks**



Surface Water Samples

Analyte	Total	Pre Impact 4/30/2010 – 5/15/2010				Post Impact 5/16/2010 – 9/17/2010			
		Total	Detected	Exceeds Aquatic Life Benchmarks		Total	Detected	Exceeds Aquatic Life Benchmarks	
				Chronic	Acute			Chronic	Acute
All Samples	1316	103				1213			
PAHs	1278	101	13	0	0	1177	139	17	9/17
Metals Nickel/vanadium	1272	98	77	6	0	1174	1045	42	3/42
Dispersants	1153	0	0	0	0	1153	2	0	0



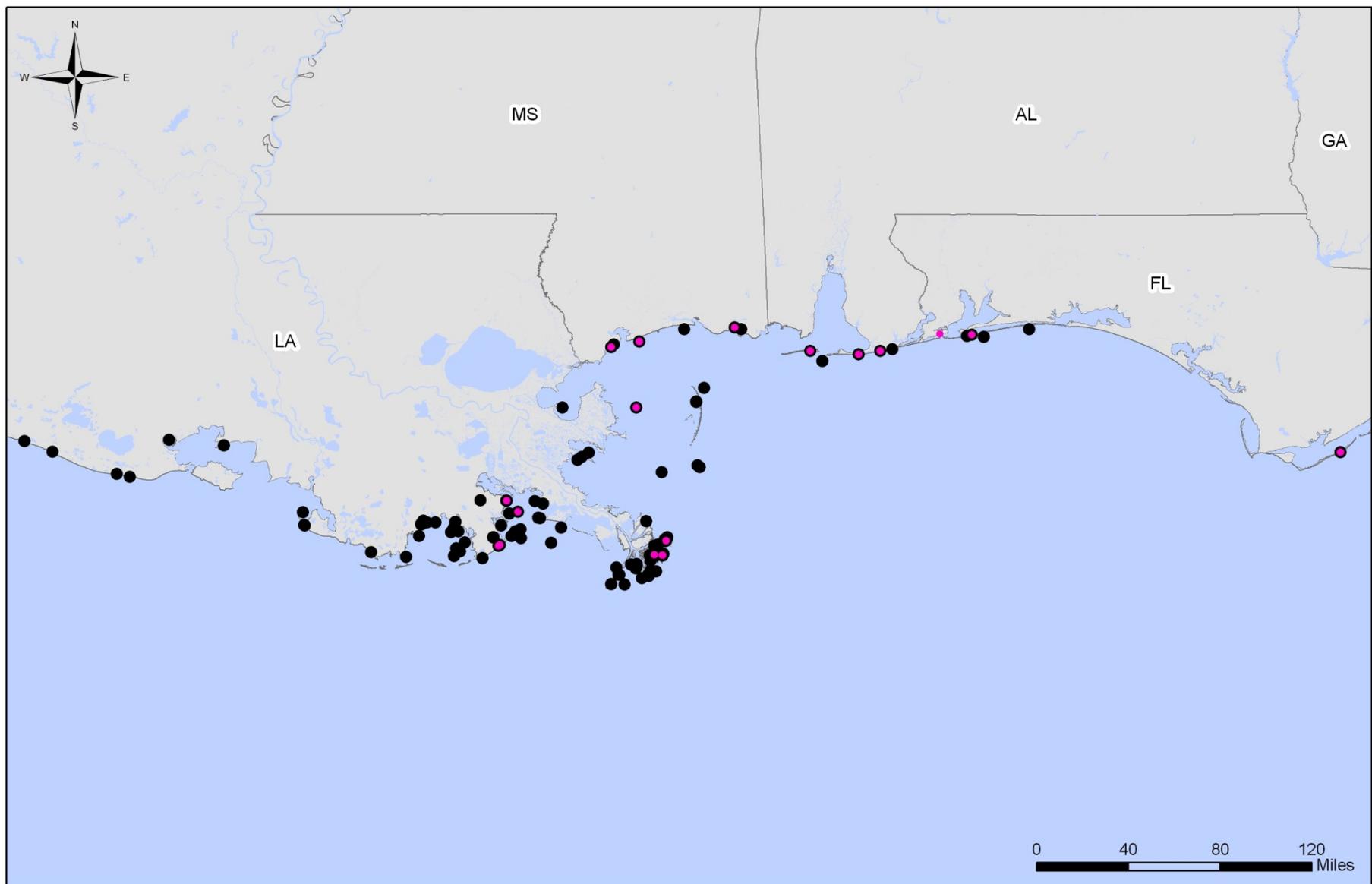
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- Surface Water Sampling Location

**BP Oil Spill Response
Surface Water Sampling Locations
April 30, 2010 - September 17, 2010**



Data Sources: EPA and ESRI



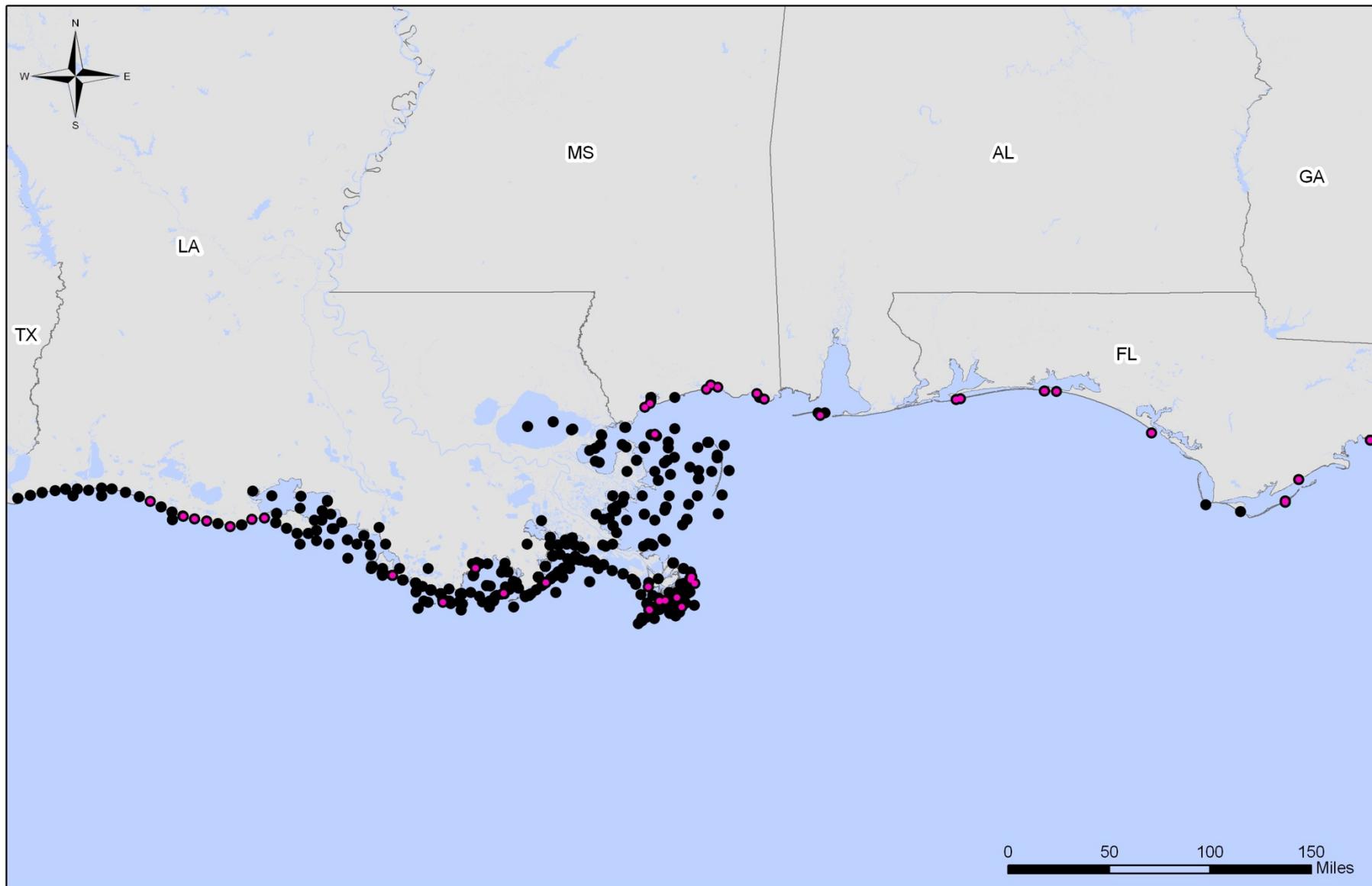
Legend

- PAH Detection
- PAH Exceedance

**BP Oil Spill Response
 Polyaromatic Hydrocarbons in
 Surface Water Samples
 April 30, 2010 - September 17, 2010**



Data Sources: EPA and ESRI



Legend

- Metal Detection
- Metal Exceedance

**BP Oil Spill Response
Metals in Surface Water Samples
May 1, 2010 - September 17, 2010**



Data Sources: EPA and ESRI



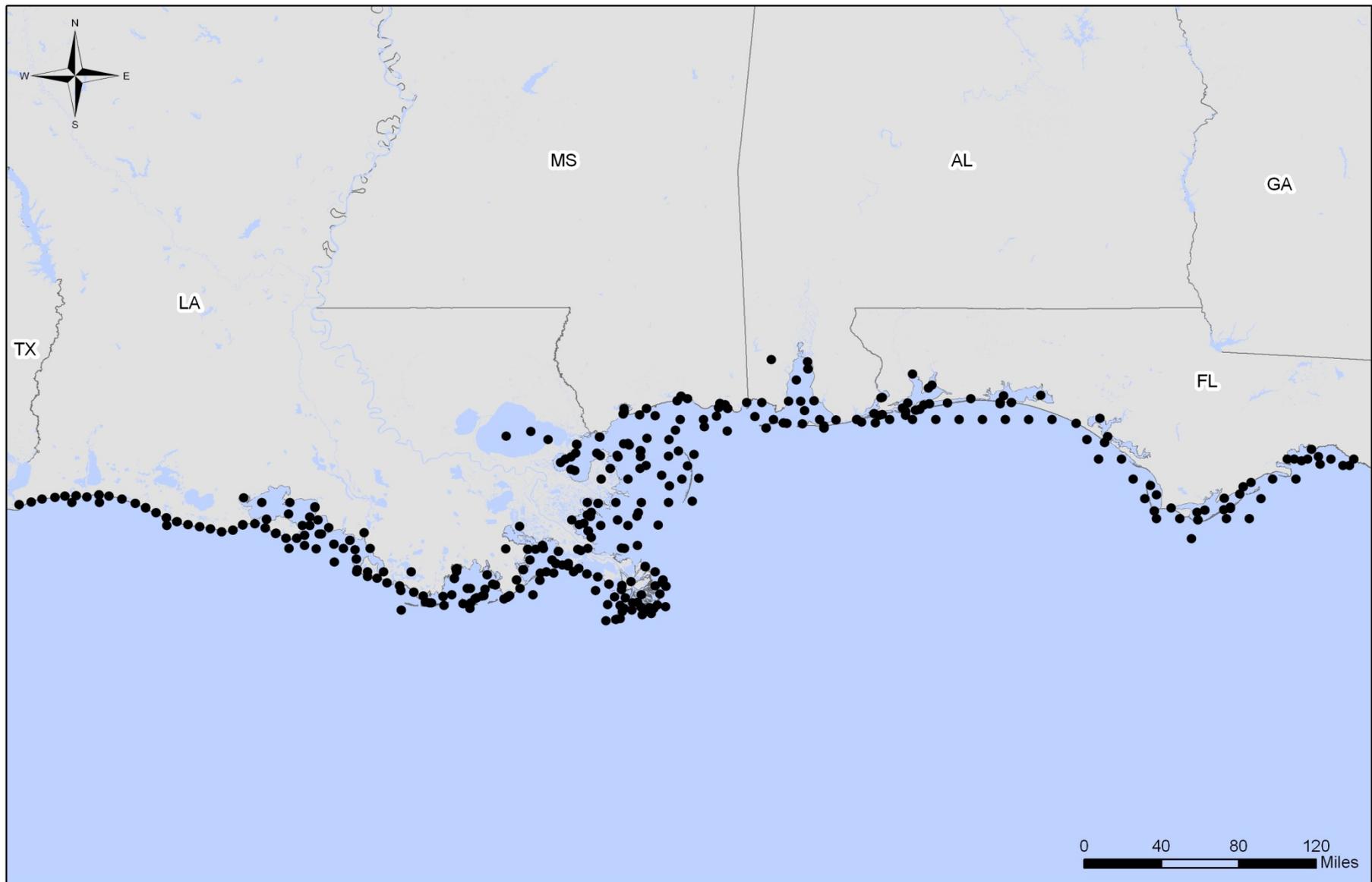
Sediment Samples

Analyte	Total	Pre Impact 4/30/2010 – 5/15/2010				Post Impact 5/16/2010 - 9/29/2010			
		Total	Detected	Exceeds Aquatic Life Benchmarks		Total	Detected	Exceeds Aquatic Life Benchmarks	
				Chronic	Acute			Chronic	Acute
All Samples	455	90				365			
PAH	452	89	23	1	1/1	363	133	11	1/11
Metals Nickel/Vanadium	447	90	85	6	0	357	353	86	2
Dispersants	141	1	0	0	0	140	6	0	0



Sediment Samples as a Percentage of Samples Collected

- PAHs
 - Pre-Impact 25.8% Detected
 1.1% Exceeded Aquatic Benchmarks
 - Post-Impact 36.6% Detected
 3.0% Exceeded Aquatic Benchmarks
- Metals (Vanadium and/or Nickel)
 - Pre-Impact 94.4% Detected
 6.7% Exceeded Aquatic Benchmarks
 - Post-Impact 98.9% Detected
 24.0% Exceeded Aquatic Benchmarks



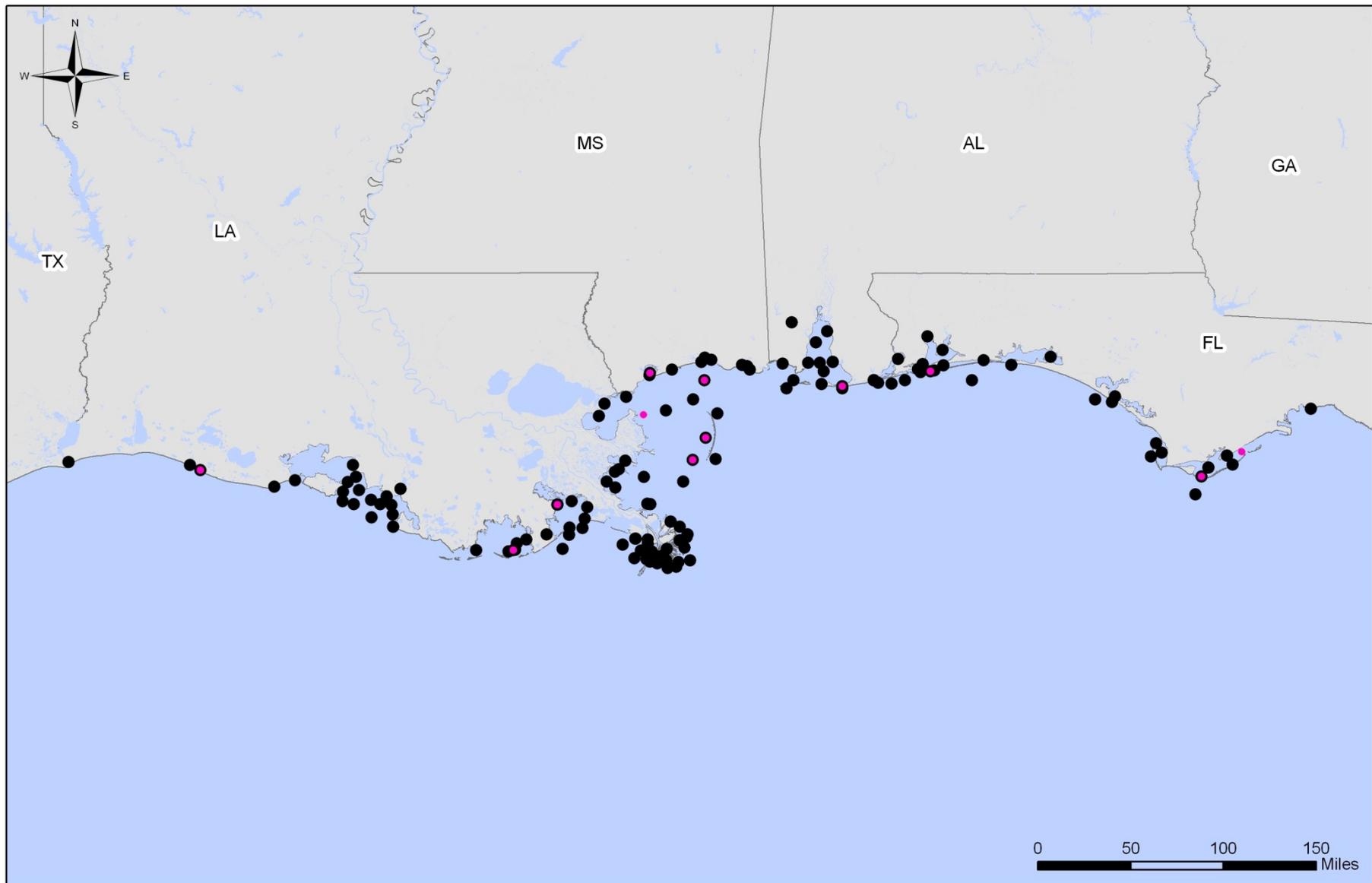
Legend

- Sediment Sampling Location

**BP Oil Spill Response
Sediment Sampling Locations
April 30, 2010 - September 29, 2010**



Data Sources: EPA and ESRI



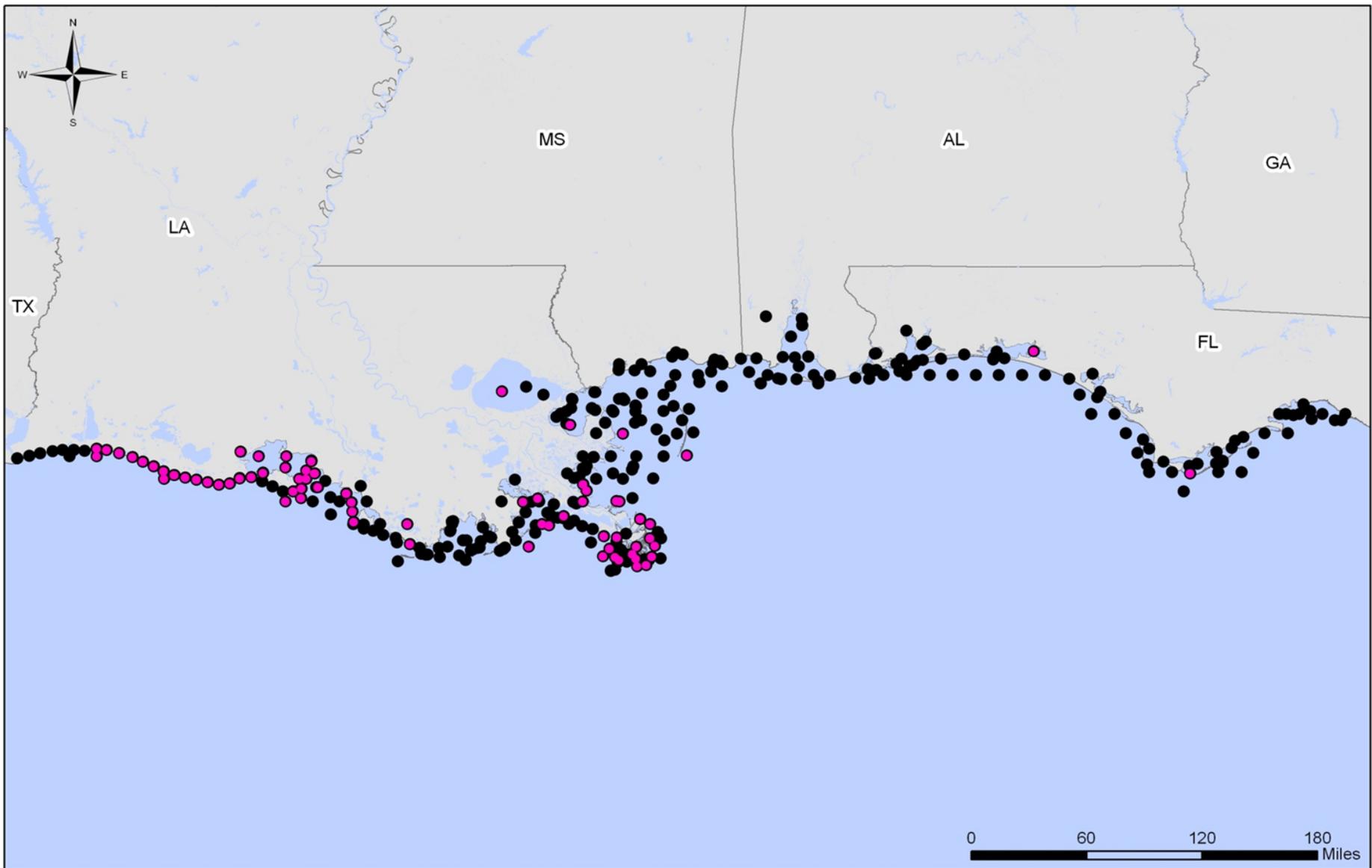
Legend

- PAH Detection
- PAH Exceedance

**BP Oil Spill Response
Polyaromatic Hydrocarbons in
Sediment Samples
April 30, 2010 - September 26, 2010**



Data Sources: EPA and ESRI



Legend

- Metal Detection
- Metal Exceedance

**BP Oil Spill Response
Metals in Sediment Samples
April 30, 2010 - September 29, 2010**



Data Sources: EPA and ESRI