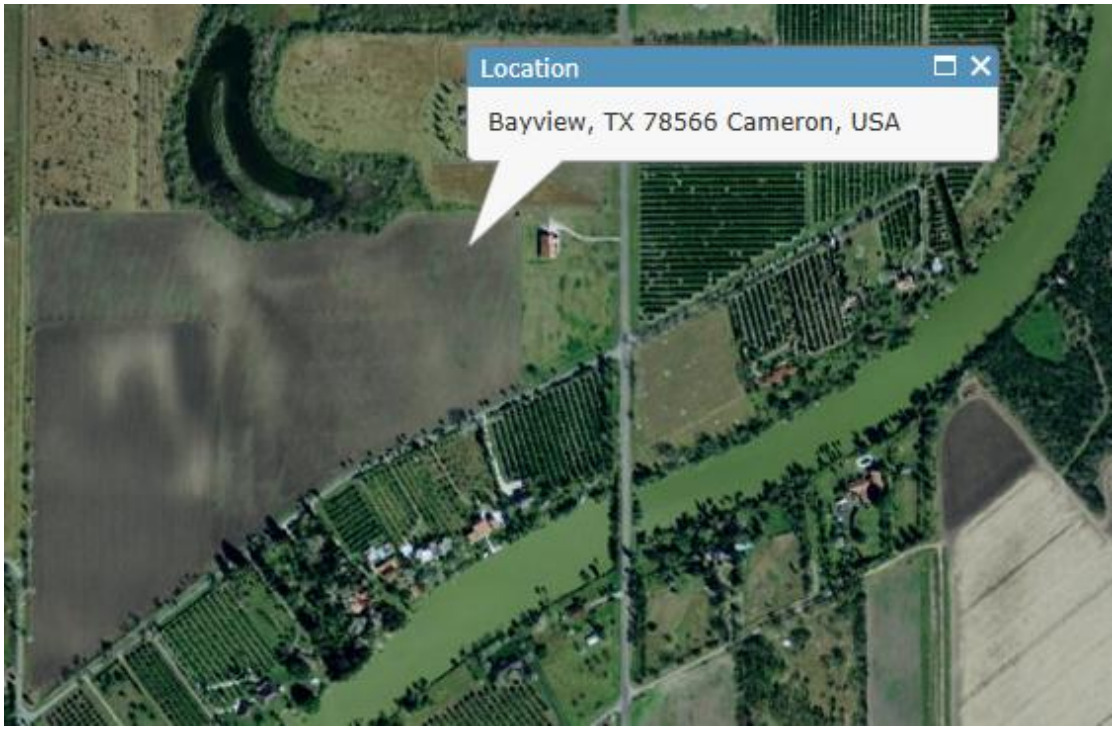
# Report for Hydrodynamic Uncertainty in Oil Spill modeling Based on GIS

Status of the project:
I was in the process of looking for the proper wind and tide data, which are the most important factor that would lead to hydrodynamic Uncertainty in Oil Spill. For the reason that free wind and tide data is correspondingly not that easy to find through Internet, however, there might be some immediate data online that represents the moment of conditions.

Below is the research area of the certain Oil Spill by using ArcGIS.




Below is the wind data source.
http://www.winddata.com/
This database contains four different categories of wind data: time series of wind characteristics, time series of wind turbine responses, wind resource data and wind farm data. These time series are primarily intended for wind [turbine] design purposes and the resource data can be used for siting analysis.

Below is the tide source from NOAA.
http://www.srh.noaa.gov/lch/?n=tides

TEXAS

| Predictions | Station | Latitude | Longitude | Mean Range (ft) | Diurnal Range (ft) | Mean Tide Level (ft) |
|---|---|---|---|---|---|---|
| Predictions | Sabine Bank Lighthouse | 29° 28' | 93° 43' | - - | 2.8 | 1.4 |
| Predictions | Sabine Pass (jetty) | 29° 39' | 93° 50' | - - | 2.5 | 1.2 |
| Predictions | Sabine Pass | 29° 43.8' | 93° 52.2' | 1.09 | 1.60 | 0.96 |
| Predictions | Mesquite Point, Sabine Pass | 29° 46' | 93° 54' | - - | 1.3 | 0.6 |
| Predictions | Galveston Bay entrance, south jetty | 29° 20' | 94° 42' | - - | 2.0 | 1.0 |
| Predictions | GALVESTON, Galveston Channel | 29° 18.6' | 94° 47.6' | 1.02 | 1.41 | 0.81 |
| | Galveston Bay | | | | | |
| Predictions | Port Bolivar | 29° 21.9' | 94° 46.8' | 1.13 | 1.40 | 0.85 |
| Predictions | Texas City, Turning Basin | 29° 23' | 94° 53' | - - | 1.4 | 0.7 |
| Predictions | Eagle Point | 29° 28.8' | 94° 55.1' | 1.01 | 1.09 | 0.60 |
| Predictions | Clear Lake | 29° 33.8' | 95° 04.0' | 1.05 | 1.16 | 0.63 |
| Predictions | Morgans Point, Barbours Cut | 29° 40.9' | 94° 59.1' | 1.14 | 1.31 | 0.72 |
| Predictions | Lynchburg Landing, San Jacinto River | 29° 45.9' | 95° 04.7' | 1.21 | 1.48 | 0.78 |
| Predictions | Manchester, Houston Ship Channel | 29° 43.1' | 95° 15.1' | 1.27 | 1.64 | 0.90 |
| Predictions | Round Point, Trinity Bay | 29° 44' | 94° 42' | - - | 1.0 | 0.5 |
| Predictions | Point Barrow, Trinity Bay | 29° 44' | 94° 50' | - - | 1.1 | 0.5 |
| Predictions | Gilchrist, East Bay | 29° 31' | 94° 29' | - - | 1.2 | 0.6 |
| Predictions | Jamaica Beach, West Bay | 29° 12' | 94° 59' | - - | 1.0 | 0.5 |
| Predictions | Alligator Point, West Bay | 29° 10' | 95° 8' | - - | 0.9 | 0.4 |
| Predictions | Christmas Bay | 29° 02.5' | 95° 10.5' | 0.71 | 0.82 | 0.42 |
| Predictions | Galveston Pleasure Pier | 29° 17.1' | 94° 47.3' | 1.46 | 2.04 | 1.12 |

As we can see, the above tide database contains Mean Range, Diurnal Range and Mean Tide Level of different gages in Texas.

## 2011 NOAA Tide Predictions: Alligator Point, West Bay

(Reference station: Galveston, Corrections Applied: Times: High +2 hr. 39 min., Low +2 hr. 33 min., Heights: High *0.64, Low *0.64)

### January - Alligator Point, West Bay

| Date | Day | Time | Height | | Time | Height | | Time | Height | | Time | Height | | Time | Height |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 01/01/2011 | Sat | 10:21AM LST | -0.5 | L | 07:02PM LST | 0.8 | H | | | | | | | | |
| 01/02/2011 | Sun | 12:19AM LST | 0.6 | L | 02:26AM LST | 0.6 | H | 11:06AM LST | -0.5 | L | 07:43PM LST | 0.8 | H | | |
| 01/03/2011 | Mon | 12:40AM LST | 0.6 | L | 03:17AM LST | 0.6 | H | 11:48AM LST | -0.5 | L | 08:21PM LST | 0.7 | H | | |
| 01/04/2011 | Tue | 12:53AM LST | 0.6 | L | 04:05AM LST | 0.6 | H | 12:28PM LST | -0.5 | L | 08:54PM LST | 0.6 | H | | |
| 01/05/2011 | Wed | 01:07AM LST | 0.6 | L | 04:50AM LST | 0.6 | H | 01:05PM LST | -0.4 | L | 09:24PM LST | 0.6 | H | | |
| 01/06/2011 | Thu | 01:32AM LST | 0.5 | L | 05:35AM LST | 0.6 | H | 01:39PM LST | -0.3 | L | 09:50PM LST | 0.6 | H | | |
| 01/07/2011 | Fri | 02:14AM LST | 0.4 | L | 06:23AM LST | 0.5 | H | 02:11PM LST | -0.3 | L | 10:13PM LST | 0.5 | H | | |
| 01/08/2011 | Sat | 03:13AM LST | 0.4 | L | 07:24AM LST | 0.4 | H | 02:40PM LST | -0.1 | L | 10:34PM LST | 0.5 | H | | |

More specifically in the certain location, like West Bay, we can check the immediate tide data every day at different time.

Future work:

1. Concentrate on these data to analysis the trends and changes of the data via time and spaces.
2. Make graphs of the results to indicate the wind and tide factors that would impact the uncertainty of Oil Spill.
3. Create a geodatabase which contains all of the results.