

16-020 HTP (Terrapin) Project Report

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Objective

The objective of the experiment was to acquire a new and unique seismic dataset from explosions in and above water to understand how water effects seismic energy coupling and propagation.

Seismic Stations

Figure 1 shows the locations of the seismic stations relative to the shot points. The seismometers (2 Hz L-22 and 1 Hz L-4C 3D) were installed in a near-linear array extending away from the test site from 1.5 to 12 km distance. The sensors were oriented to true north, leveled, and covered with dirt. Data for all stations were recorded at 1000 sps on a Reftek RT130 DAS. An external GPS clock acquired UTC time. Table 1 lists the station locations and hardware. Table 2 provides nominal sensor sensitivities. RT130 bit weights are included for each recorder with the submitted data.

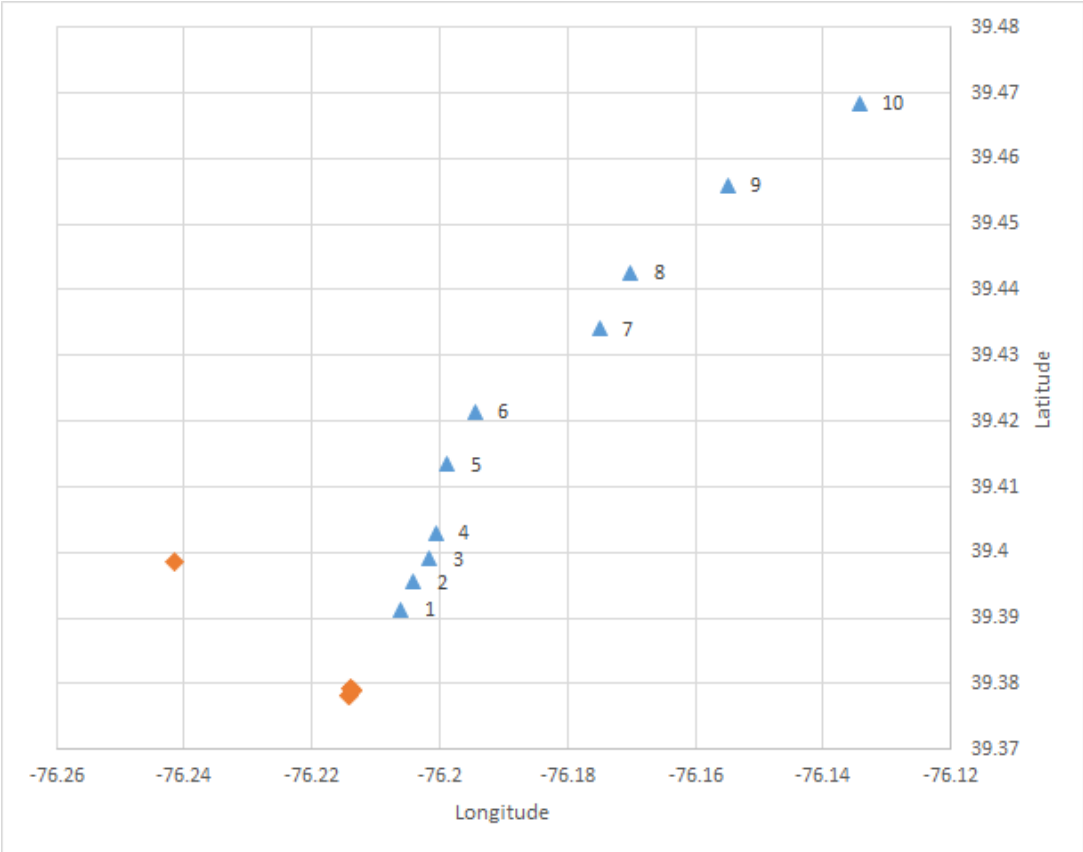


Figure 1. Map of seismic stations (triangles) and shot locations (orange diamonds).

Table 1. Seismic Stations.

Station	Latitude (WGS84)	Longitude (WGS84)	Elevation (m)	Depth (m)	Digitizer	Sensor
1	39.39118	-76.20601	2	0.5	RT130 9D9E	Sercel L-4C 3D 69
2	39.39548	-76.20406	3	0.5	RT130 AB20	Sercel L-22 106
3	39.39903	-76.20165	5	0.5	RT130 9395	Sercel L-4C 3D 66
4	39.40293	-76.20054	3	0.5	RT130 9DDF	Sercel L-22 N/A
5	39.41342	-76.19875	5	0.5	RT130 9FBD	Sercel L-4C 3D 65
6	39.42147	-76.19445	4	0.5	RT130 98F5	Sercel L-22 1513L
7	39.43403	-76.17495	6	0.5	RT130 9D7C	Sercel L-22 108
8	39.44258	-76.17016	7	0.5	RT130 91EB	Sercel L-4C 3D 61
9	39.45581	-76.15499	8	0.5	RT130 969F	Sercel L-4C 3D 62
10	39.46840	-76.13437	11	0.5	RT130 9664	Sercel L-22 110

Table 2. Sensor Sensitivity.

Channel	L-22 Sensitivity (V/m/s)	L-4C 3D Sensitivity (V/m/s)
1	-88	-280
2	88	-280
3	88	-280

Explosions

A series of explosions were conducted at a range of heights over water and depths below water. Explosions were conducted in two locations. Except for Event 9, all charges were identical and only the emplacement varied. Table 3 provides pertinent shot information.

Table 3. Blast size and origin information

Event	Date	Origin Time (UTC)	Latitude (WGS84)	Longitude (WGS84)	Depth (m)	Surface Elev (m)	TNT Equivalent (kg)
1	10/3/2016	20:12:07.605	39.37811	-76.21434	-0.27	1.75	175.3
2	10/6/2016	19:52:29.602	39.37811	-76.21434	-0.27	1.75	175.3
3	10/5/2016	20:01:42.780	39.37912	-76.21365	-2.13	1.31	175.3
4	10/7/2016	16:54:41.075	39.37912	-76.21365	-0.27	1.31	175.3
5	10/11/2016	20:11:41.444	39.37912	-76.21365	0.27	1.31	175.3
6	10/12/2016	16:21:32.255	39.37912	-76.21365	2.14	1.31	175.3
7	10/13/2016	17:40:27.068	39.37937	-76.21391	2.14	1.28	175.3
8	10/17/2016	15:53:45.534	39.37937	-76.21391	8.57	1.28	175.3
9	10/6/2016	18:17:09.877	39.39846	-76.24161	4.61	0.73	455.7

ACKNOWLEDGMENTS

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