

Appendix A. NAGL 98-01A Event Log

Date	Time (EST)	Year-Day	Latitude	Longitude	Event	Comments
July 9, 1998	8:13	190.34	41.5250	70.6666	R/V Sea Diver Arrive WHOI	
July 10, 1998	14:00	191.58	41.5250	70.6666	Test Launch ROV	
July 10, 1998	15:10	191.63	41.5250	70.6666	Recover ROV	
July 10, 1998	17:00	191.71	41.5250	70.6666	Test Launch ROV	
July 10, 1998	18:10	191.76	41.5250	70.6666	Recover ROV	
July 11, 1998	11:03	192.46	41.5250	70.6666	Depart WHOI	
July 11, 1998	15:20	192.64	41.9127	70.3883	Launch ROV in Cape Cod Bay	Depth 25m
July 11, 1998	17:50	192.74	41.9127	70.3883	Recover ROV	
July 11, 1998	18:50	192.78	41.9339	70.3694	Deploy Greene Bomber	
July 11, 1998	19:00	192.79	41.9339	70.3694	Steam to Station 1	
July 12, 1998	6:58	193.29	42.4054	69.6007	Arrive Station 1	
July 12, 1998	8:22	193.35	42.3892	69.5996	CTD Cast	Depth 224m Depth correction -0.45m
July 12, 1998	8:35	193.36	42.3903	69.6007	Recover CTD	ASCII File 07129800.cnv Matlab File ctd07129800.dat
July 12, 1998	9:05	193.38	42.3968	69.5997	Deploy ROV	Depth 22m
July 12, 1998	11:25	193.48	42.3937	69.5972	Recover ROV	
July 12, 1998	13:06	193.55	42.3830	69.5792	Deploy ROV	Depth 22m
July 12, 1998	13:59	193.58	42.3743	69.5763	Recover ROV	
July 12, 1998	14:07	193.59	42.3696	69.5758	Steam to New Station	
July 12, 1998	17:30	193.73	42.2490	69.8558	On Station	
July 12, 1998	18:22	193.77	42.2485	69.8562	CTD Cast	Depth 212 Depth correction -0.35m
July 12, 1998	18:35	193.77	42.2485	69.8562	Recover CTD	ASCII File 71298B.CNV Matlab File ctd0712981820.dat
July 12, 1998	19:27	193.81	42.2503	69.8487	Deploy ROV	
July 12, 1998	20:37	193.86	42.2550	69.8420	Recover ROV	
July 12, 1998	21:10	193.88	42.2595	69.8357	Deploy ROV	
July 12, 1998	23:18	193.97	42.2898	69.8423	Recover ROV	
July 13, 1998	12:45	194.53	42.2483	69.8555	CTD Cast	Depth of cast 210m Depth correction -0.35
July 13, 1998	13:03	194.54	42.2473	69.8552	Recover CTD	ASCII File 71398A00.CNV Matlab File ctd0713981245.dat
July 13, 1998	13:18	194.55	42.2447	69.8568	Deploy ROV	Video calibration dive and slurp gun test
July 13, 1998	13:40	194.57	42.2420	69.8583	Recover ROV	
July 13, 1998	14:08	194.59	42.2373	69.8610	Deploy ROV	
July 13, 1998	17:14	194.72	42.2343	69.8673	Recover ROV	

Date	Time (EST)	Year-Day	Latitude	Longitude	Event	Comments
July 13, 1998	17:37	194.73	42.2357	69.8658	Deploy Reeve Net	Vertical tow from 20 m
July 13, 1998	17:52	194.74	42.2365	69.8660	Recover Reeve Net	
July 13, 1998	19:50	194.83	42.2500	69.8540	CTD Cast	Depth of Cast 208m Depth correction -0.35
July 13, 1998	20:03	194.84	42.2500	69.8540	Recover CTD	ASCII File 71398B00.CNV Matlab File ctd0713981947.dat
July 13, 1998	20:13	194.84	42.2527	69.8550	Deploy ROV	
July 13, 1998	23:16	194.97	42.2958	69.8192	Recover ROV	
July 13, 1998	23:36	194.98	42.2970	69.8142	Deploy Reeve Net	
July 13, 1998	23:58	195.00	42.2967	69.8123	Recover Reeve Net	
July 14, 1998	0:01	195.00	42.2967	69.8123	Steam to Stellwagen Bank	
July 14, 1998	7:26	195.31	42.3500	70.3917	Arrive Stellwagen Bank	
July 14, 1998	11:54	195.50	42.3493	70.3908	CTD Cast	Depth of cast 85m. Depth correction -0.45m
July 14, 1998	12:00	195.50	42.3498	70.3912	Recover CTD	ASCII File 71498A00.CNV Matlab File ctd714981151.dat
July, 14 1998	12:25	195.52	42.3513	70.3943	Launch ROV	
July, 14 1998	14:33	195.61	42.3652	70.4132	Recover ROV	
July, 14 1998	18:42	195.78	42.3350	70.4132	Recover Greene Bomber	
July, 14 1998	18:43	195.78	42.3350	70.4132	Steam to Cape Cod Bay	
July, 14 1998	21:00	195.88	41.9962	70.3773	Arrive Cape Cod Bay	
July, 14 1998	21:15	195.89	41.9962	70.3773	Deploy Greene Bomber	
July, 15 1998	7:10	196.30	41.8762	70.2928	Recover Greene Bomber	
July, 15 1998	8:36	196.36	41.8838	70.2897	CTD Cast	Depth of cast 25m. Depth correction -0.45m
July, 15 1998	8:41	196.36	41.8852	70.2893	Recover CTD	ASCII File 71598A00.CNV Matlab File ctd0715980835.dat
July, 15 1998	8:47	196.37	41.8865	70.2880	Anchor	
July, 15 1998	9:03	196.38	41.8865	70.2880	Launch ROV	
July, 15 1998	11:20	196.47	41.8863	70.2880	Deploy Greene Bomber	
July, 15 1998	11:45	196.49	41.8863	70.2880	Recover ROV	
July, 15 1998	13:31	196.56	41.8863	70.2880	Deploy CTD	Depth of cast 28m. Depth correction -0.45m
July, 15 1998	13:34	196.57	41.8863	70.2880	Recover CTD	ASCII File 71598B00.CNV. Matlab File ctd0715981331.dat
July, 15 1998	13:54	196.58	41.8863	70.2880	Deploy ROV	
July, 15 1998	16:22	196.68	41.8863	70.2880	Recover ROV	
July, 15 1998	16:30	196.69	41.8863	70.2880	Deploy Reeve Net	
July, 15 1998	17:00	196.71	41.8863	70.2880	Recover Reeve Net	

Date	Time (EST)	Year-Day	Latitude	Longitude	Event	Comments
July, 15 1998	18:23	196.77	41.8863	70.2880	Steam transect to Stellwagen Bank	
July, 16 1998	0:05	197.00	42.3500	70.3917	Arrive Stellwagen Bank	
July, 16 1998	0:05	197.00	42.3500	70.3917	Steam back to Cape Cod Bay	
July, 16 1998	7:00	197.29	41.8865	70.2882	Anchor Cape Cod Bay	
July, 16 1998	8:30	197.35	41.8865	70.2882	CTD Cast	
July, 16 1998	8:35	197.36	41.8865	70.2882	Recover CTD	
July, 16 1998	9:00	197.38	41.8865	70.2882	Deploy ROV	
July, 16 1998	9:30	197.40	41.8865	70.2882	Recover ROV	
July, 16 1998	9:45	197.41	41.8865	70.2882	Raise Anchor	
July, 16 1998	9:45	197.41	41.8865	70.2882	Steam to deeper water in Bay	
July, 16 1998	10:27	197.44	41.8900	70.2950	Anchor New Location in Bay	
July, 16 1998	10:32	197.44	41.8900	70.2950	CTD Cast	
July, 16 1998	10:50	197.45	41.8900	70.2950	Deploy ROV	
July, 16 1998	13:04	197.54	41.8900	70.2950	Recover ROV	
July, 16 1998	13:38	197.57	41.8900	70.2950	Raise Anchor and steam west to calmer water	
July, 16 1998	16:05	197.67	41.9590	70.5073	Anchor of Manomet Pt	
July, 16 1998	17:12	197.72	41.9590	70.5073	Deploy ROV	
July, 16 1998	18:28	197.77	41.9590	70.5073	Recover ROV	
July, 16 1998	18:51	197.79	41.9590	70.5073	Weighed anchor, steam to transect start point	
July, 16 1998	20:05	197.84	41.8863	70.2880	Deploy Greene Bomber	
July, 17 1998	1:36	198.07	42.3500	70.3917	Arrive Stellwagen Bank	
July, 17 1998	7:52	198.33	41.8842	70.2883	Arrive end transect in Cape Cod Bay	
July, 17 1998	7:52	198.33	41.8842	70.2883	Recover Greene Bomber	
July, 17 1998	8:00	198.33	41.8842	70.2883	Steam to Woods Hole via Cape Cod Canal	
July, 17 1998	12:00	198.50	41.5250	70.6666	Arrive WHOI	

Appendix B. Down-Looking Acoustics Data Acquisition Log for Sea Diver Cruise NAGL 98-01A

HTI-244 Echosounder running 120 and 420 kHz Transducers, several config files "JULY_SEADIVER_120/420.cfg"

Station/ Leg	Date (year-day)	Acoustic File	Start ESS	End ESS	ESS File Name	Comments
Cape Cod Bay 11 July	98192	W1921859	1859	0803	gb00001	Start in Cape Cod Bay - First deployment. Steaming to Wilkinson Basin at 1900.
	98-192	W1922105				Getting garbage on echo sounder like that seen on AL9808. Start recording acoustics again with LAN minimized
	98-192	W1922144				Another try with a new LAN cable - No effect on signal.
	98-192	W1922205				Tried different settings - no luck.
	98-192	W1922205				Turned on Calibrator with spaced pulses - seems OK, but color bars not consistent in increasing from dark blue to red.
	98-192	W1922232				Back to collecting crummy data.
	98-192	W1922308				Shut the DES system down and took out the PC104 board and reseated it. Tried data acquisition again, but no luck. Data quality awful. Let run for rest of the night.
12 July	98-193	W1930643				Re-started system with only the 120 kHz running and halfway through this recording session, the system started working properly (at least the echogram looked decent).
	98-193	W1930752				Back to both transducers and back to garbage for data.
Wilkinson Basin	98-193	W1930807	0805	1442	gb00002	Start new ESS at Station in Wilkinson Basin. Running only the 420 kHz transducer. After several bad scans, this one seems to be working.
	98-193					Ended at 1030 for data transfer to post processing computer.
	98-193	W1931046				Re-started acoustics (420 kHz only) after data transfer for day 192.
	98-193	W1931057				Decided to try fish tracking and TS logging. Tracking set to -80 to -40 dB with threshold set at 0.01 volts.
	98-193					Ended TS/Echo Integration processing when ship got underway towards P-town for cell phone contact at 1407.
	98-193	W1931410				Started 120 kHz file for steam to new station in Wilkinson Basin. Echogram not doing too well. Data awful.
	98-193		1444	1941	gb00003	Started new ESS while steaming towards P-town.
	98-193					Stopped at 1918 to change over to 420 kHz.
	98-193	W1931920				Started 420 kHz just before the ROV went into the water.
	98-193		1944	2346		Started ESS during ROV dive.

HTI-244 Echosounder running 120 and 420 kHz Transducers, several config files "JULY_SEADIVER_120/420.cfg"						
Station/ Leg	Date (year-day)	Acoustic File	Start ESS	End ESS	ESS File Name	Comments
	98-193					Ended acoustics logging at 2340 after ROV on deck.
	98-193	W1932345				Start 120 kHz for the night run with "July_seadiver_120_1998.cfg"
	98-193		2350	0653	gb00005	ESS started for night run ended and screen capture made.
						End acoustics at 0652 to zip data and do transfer.
13 July	98-194	w1940714	0710?	1404	gb00006	120 kHz acoustics started after data transfer. No ROV operations ended 120 acoustics at 1402 after ROV deployed- switched to 420 kHz.
			1406	1657	gb00007	ROV in the water - Started 420 kHz with TS. For some unknown reason, the DES lost synch with the computer and the system need to be re-started from scratch.
	98-194	W1941415				Started 420 kHz with TS acquisition.
						Ended ESS because GPS seemed not to be working and also ended acoustics at 1706.
	98-194	W1941708	1700?	2336	gb00008	Started new files when ROV came up - Now doing acquisition. with 120 kHz transducer.
	98-194		2337	0815	gb00009	Ended in morning.
						Stopped acoustics to switch to 420 kHz. ROV just went in water.
	98-194	W1942018				Started run with 420 kHz with TS.
						Ended run at 2103 (77460 echoes).
	98-194	W1942105				Started new 420 kHz run without TS .
						Ended 420 kHz at end of ROV deployment.
	98-194	W1942303				Started recording 120 kHz with TS (threshold set to 0.05 volts) while ROV coming on board.
						Ended 120 - TS run (187532 echoes at 2334)
	98-194	W1942335	0817	1448	gb00010	Started new ESS and 120 kHz without TS after ROV on board. We started steaming closer to Stellwagen Bank (Mass Bay) at 0001 after Net tow.
Stellwagen Bank to Mass Bay						Ended 120 kHz with lots of garbage data at 0813 after arrival at Stellwagen Bank / Mass Bay area.
						Shut down system and rebooted.
14 July	98-195	W1950822				Started up 120 kHz acquisition. Took two screen captures of ESS before restarting it. The 120 kHz was so bad that tried to bring up the 420 kHz with TS on. The TS seemed to be working, but the echograms are not good at all.
	98-195	W1950909				Started 120 kHz without TS.

HTI-244 Echosounder running 120 and 420 kHz Transducers, several config files "JULY_SEADIVER_120/420.cfg"						
Station/ Leg	Date (year-day)	Acoustic File	Start ESS	End ESS	ESS File Name	Comments
						At 1012, turned off Transmitter enable and receive enable to look at noise levels.
						At 1125 - the xmit and receive channels were enabled.
						Ended 120 kHz acquisition at 1329 - mostly garbage data.
	98-195	W1951331				Started 420 kHz with TS
						Ended at the end of the ROV diver at 1417 (91327 echoes)
	98-195	W1951420				Started 120 kHz as ROV was taken out of the water.
	98-195		1451	1833	gb00011	Ended gb00010 at 1448 and started new ESS
						Ended acoustics at 1745 to go to work on getting analog signal tap points installed.
						End ESS at 1833 to steam to Cape Cod Bay site after bringing Greene Bomber on board.
Cape Cod Bay	98-195	W1951923				This file started to look at noise on deck and then in water after Tim checked the boards in the DES and added the analog output leads.
						Acoustics ended at 2133.
	98-195	W1952133				Start logging 120 kHz data.
						Stop single channel acquisition at 2210 to set up dual echo sounding (i.e. both 120 and 420)
	98-195	W1952212				Start recording on both transducers.
						End recording at 2335.
	98-195	W1952326				Test in continuous CW mode to look at oscilloscope output while Tim talked to Tom Torkelson and they trouble shot the DES system. Echogram was on xmit 25
	98-195	W1952331				Xmit set to 5 in CW mode to do another test on the oscilloscope. The system was shut down for the night because it was determined that the MUX bottle needed to be by-passed. This was done in the morning before the next deployment of the fish.
15 July	98-196	W1961127				At anchor in Cape Cod Bay. Started 120 kHz after MUX surgery which by-passed the MUX boards. Only 120 kHz operational after surgery.
	98-196		1125?	1829	gb00013	End at 1203 to check suspicious layer at 7m (3m below the fish). System operating at 2 pings per second. No logging of fluorometer or light because options were turned off during this period of logging with the ESS.
	98-196	W1961204				Start new 120 kHz at 1 ping per second to see if it is a bottom echo

HTI-244 Echosounder running 120 and 420 kHz Transducers, several config files "JULY_SEADIVER_120/420.cfg"						
Station/ Leg	Date (year-day)	Acoustic File	Start ESS	End ESS	ESS File Name	Comments
						coming in from a previous ping. This did not get rid of the _ m layer at 3-3.5 m. So stopped acquisition to go back to 2 pings per second.
	98-1956	W1961224				Restart 120 with TS at 2 pings per second.
						Ended to stop TS at 1318 (142,352 echoes).
	98-196	W1961318 W1961320 W1961322				Noise check surgery on the transmitter and receive channel disabled. The first two files are duds because of mistakes in changing the setup. Noise levels were higher than seen earlier in the cruise
						Ended run to take off analog signal wires because we saw a noise change to lower levels when channel 1 BNC was removed from the oscilloscope and to lower levels yet when the trigger cable was removed.
	98-196	W1961354				Noise check after the wires for the analog output were removed. There was no change in the noise levels.
						Ended run at 1437 with pulse width of 1.25 ms.
	98-196	W1961438				Noise check after increasing pulse width to 5.0 ms.
						Ended run after 5 minutes of recording. Noise levels were much lower.
	98-196	W1961444				Started run with longer pulse width (5.0 ms) and transducers enabled.
						Stopped at 1454 to check out layers at 1 and 3 m. With the longer pulse length, a new artificial layer appeared at the top of the echogram.
	98-196	W1961454				Started a new run in pulse mode (not chirp) with a 0.5 ms pulse width to see affects on the echogram. At 1504, we lowered the fish down 1 meter and the layer at 3.2 meters went down to 4.2 m, but everything else came up i.e. the bottom and other layers. At 1515, we moved the fish out a meter from the side of the ship and up a meter. That did not improve the situation. It seemed that we were measuring the depth of the fish. How possible? At 1527, we put the fish back to the standard depth and the layer re-appeared. At 1533 the recording was ended.
	98-196	W1961535				Started recording with the 10 kHz chirp and 5.0 ms pulse width.
						1759 - fish was taken out of the water for a brief period to turn the fish around. It did a 360 and the wires were twisted. During the time the fish was out of the water, the xmitter and receivers were disabled.
Cape Cod Bay to Mass Bay			1831	0006	gb00014	ESS run ended and new one started at beginning of transect from Cape Cod Bay to Stellwagen Bank and Massachusetts Bay after pulling the anchor.
	98-196	W1961832				Started acoustics at start of transect.

HTI-244 Echosounder running 120 and 420 kHz Transducers, several config files "JULY_SEADIVER_120/420.cfg"						
Station/ Leg	Date (year-day)	Acoustic File	Start ESS	End ESS	ESS File Name	Comments
						end acoustics at 0006; end of transect to North and turned around and now heading south back to Cape Cod Bay
16 July	98-197	W1970009	0008	0658	gb00015	Start ESS & new acoustics for transect: Mass Bay-Cape Cod Bay
	98-197	W1960700	0658	1634	gb00016	End ESS and acoustics at arrival in Cape Cod Bay station
						End acoustics to transfer data almost immediately after starting the file.
	98-197	W1970758				Start acoustic time series again.
						End at 1110 to set up for TS measurements
	98-197	W1971111				Started acoustics (120 with TS) and set TS threshold at 0.01.
						End acoustics at 1256 with 438985 echoes. The ROV was in the water during this period and Tim and Joe were collecting TS from the ROV.
	98-197	W1971258				Start new 120 file without TS. Some time on this run steaming towards Plymouth.
						End at new station near Plymouth.
	98-197	W1971631				Restart with 120 kHz. This run ended after short period to set up for Target Strength calibration run.
	98-197		1635	1835	gb00017	End ESS at 1634 and restart with gb00017.
						End Acoustics at 1721
	98-197	W1971733				After set up with 3 balls below 120 kHz transducer and a couple of false starts, start calibration run. Focus principally on the 38.1 mm ball because 420 kHz out of service.
						End both ESS and acoustics about 1834. Greene Bomber brought on board Sea Diver for steam to night transect starting point.
	98-197	W1972014	2011	0753	gb00018	Start night transect from study site in Cape Cod Bay with Pulse Length = 5.0 ms and 10 kHz chirp
						End acoustics at 0012, somewhat short of the end of the first section of the night transect in Mass Bay (Stellwagen Bank).
	98-198	W1980013				Start immediately next file with acoustics - ESS left running without change.
						End acoustics and ESS at 0753 when arrived back in Cape Cod Bay at study site. Did a screen capture on ESS. End of data acquisition on SEA DIVER NAGL 98-01A