

Dyson 20-12 Mooring Report

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Summary:

The DBO-EcoFOCI 2020 survey took place on the NOAA ship Oscar Dyson from 23 August through 25 September 2020. The cruise began in Seattle, WA, ending in Kodiak, AK. The scientific cruise track began with mooring operations in Unimak Pass, AK, continued northward along the 70m isobath in the Bering Sea, then progressed into the Chukchi and western Beaufort Seas before finishing southward along the 50 m isobath in the Bering, then south of the Aleutians to Kodiak, AK. A variety of scientific operations were carried out, including mooring deployments and recoveries, drifter and pop-up buoy deployments, CTD and bongo net sampling, and seabird and mammal visual surveys.

In total we facilitated 53 recovery and deployment operations, including 8 PUF deployments and 2 Sat-tracked drifter deployments (see attached table 'Dy20-12 DeployedAndRecovered'). We recovered 27 moorings and deployed 16 for PMEL, MML and AFSC. Mooring recoveries included the FCOM sinking mooring and 4 AFSC trawl-resistant moorings for DeRobertis.¹

Things that went well:

Passive acoustic moorings – the diagram was straightforward and there was enough chain/shackles/etc. for all the moorings. All acoustic releases functioned well except for the few mentioned below. For the most part, I could hear the chains dropping onto the anchors when the moorings were released. A good confirmation that they had released.

The bosun decided to try a new system of deploying these mooring, that involved using the outhaul to pick above the release with a quick release, and the float on another quick release using the net reel. The entire mooring was then lifted in a large 'N' (Fig. 1). The Bosun found this to be much more safe than to use the deck chain to stopper off sections. The only part that was a bit sketchy is that no pin was used in the quick release for the float – a deckhand would just keep the release line slack. This same method (in reverse – and without the quick releases) was used to recover the larger oceanographic moorings for the same reason (Fig. 2).



Figure 1. Mooring deployment in 'N' shape.



Figure 2. Mooring recovery in 'N' shape

AFSC trawl resistant moorings – the Peggy D was launched for the first three recoveries, but the Bosun decided to attempt the last recovery from the starboard rail because the seas were larger. That recovery went well. I think one of the deckhands suggested a slightly larger (but still recessed) lifting point inside the housing to allow easier hooking on retrieval.

Things that could be improved:

NRS1 – When deploying this mooring, there was a 10m section instead of a 47m section. Didn't realize this until the full spool was wound onto the net reel for deployment, and we found the 10m section, connected to a 1m chain with a swivel that looked like it should be at the anchor-end of the mooring. At that point it was questioned whether the entire mooring line was placed onto the spool backward, so the slow process of rewinding the line onto the spool was conducted before the other end of the line was visible on the net reel and determined to be short as well.

From Sarah Donohoe's email explaining the details to Mike Craig and Geoff Lebon on Sep 16, 2020:

In summary there was:

- 1. Missing .25 meter (3 links) chain below the first SBE-37 at 353 meter depth*
- 2. Swapped 47 meters 3/4" Nylon with 10 meters of 3/4" Nylon and an extra 1.5 ton swivel*
- 3. An extra 5/8" SL pear-link above the Haruphone at 500 meter depth*

We also had to add a 5/8" SL pear-link right above the anchor as a pick-point for the anchor-last deployment.

I have annotated the mooring diagram with what changes there were. I've also got photos of the swapped nylon section with a swivel. We ended up cutting a piece of extra chain for the 3 links we needed below the shallowest SBE. Ryan and I called Geoff to confirm that the 10 meter section of nylon above the Haruphone and the 100 meter section of vectran was going to be ok... as opposed to the 47 meters that should have been there. We got the ok to deploy with that change, which only affected the actual depth of the shallowest SBE and the 75 kHz ADCP.

It took us much longer than it should have to deploy this mooring because of the inconsistencies between what was on the reel and what was on the diagram. We missed a weather window at C3 because we arrived too late and had to cancel ops at C3... something that may have been avoided had the NRS-1 deployment gone quicker.

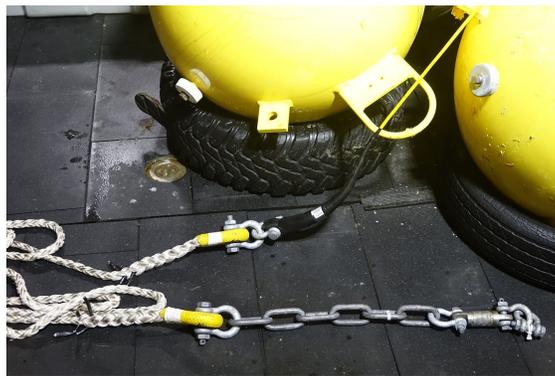


Figure 3. NRS1 10m nylon section attached to 100m vectran, and 1m chain with swivel at the float-end of the mooring. This photo was taken before we removed the swivel, broke the chain to 3 links length and shackled in the SBE37 according to the diagram (shown in Figure 4.)

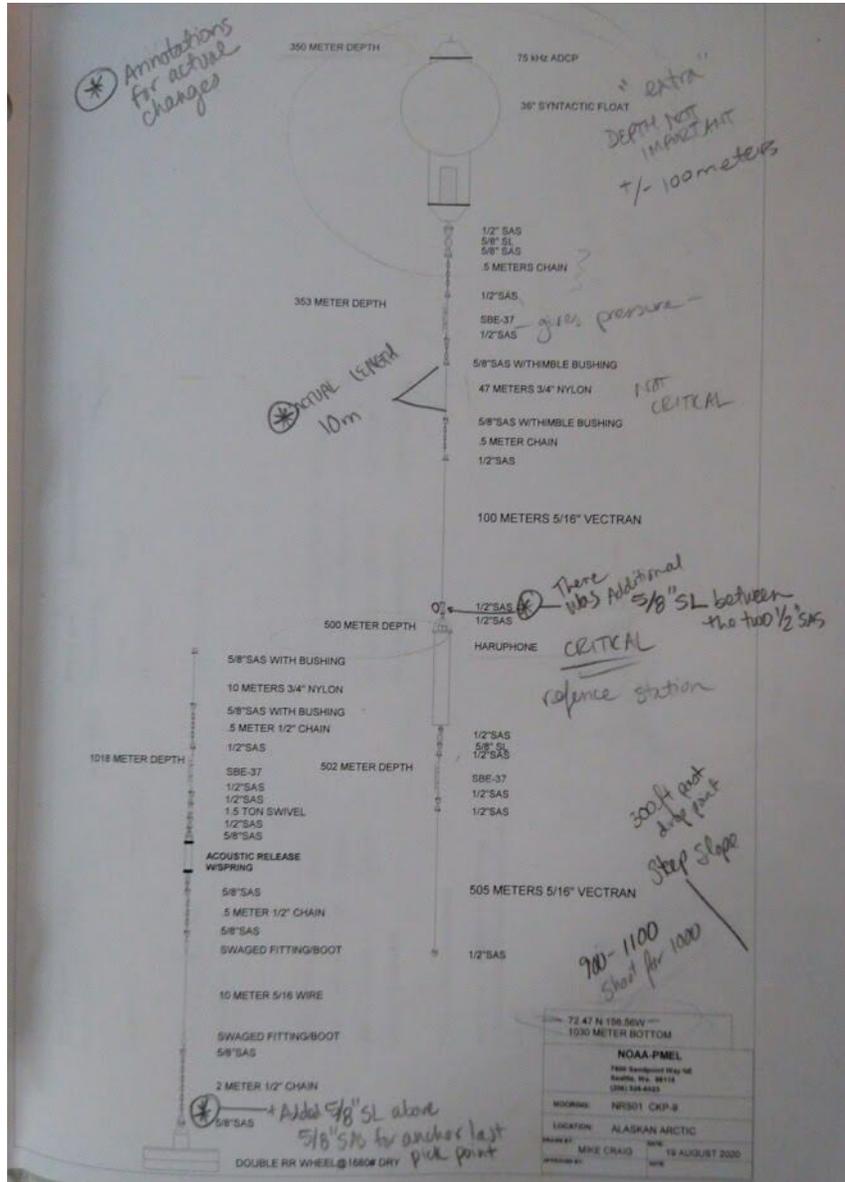


Figure 4. Annotated NRS1 diagram.

Also NRS1 – this release was the only one that responded in a funky way – we would tell it to release and it would reply – but with a ‘still unreleased’ code. The other moorings would take a few tries – and not reply at all – but we never had the Dyson switch off their echosounder, so this was most likely what was happening in these few cases. Otherwise, the acoustic releases worked fine the majority of the time.

Prawler mooring- there were no instructions included as to how to disconnect the wiring inside the breakout inductor plate. The Bosun said that when they recovered the Papa mooring, they just cut the wires. However, we were pretty sure that wasn't the case, since we had packed the cable-wraps and

Geoff explained to Sarah that they were for the Prowler's vectran wire. It turned out not to be an issue, because the wires came up detached already. Some photos/instructions showing what needs to be done would be helpful.

20SH1-A diagram and mooring chain were arranged without the Aural, mooring diagram was not updated to include the Aural on the joint PMEL/MML mooring.

Communication – it might make sense in the future for all mooring techs to be briefed on all mooring ops. It is perfectly fine to have someone take the lead for certain ones - but that second pair of eyes/brain is good to have when everyone is out at sea.

Cotter pins – we tapped out the pins that were sent in the containers as well as those we had brought as spares. If anything would have fallen overboard we would have been reusing pins. Send double the pins needed, in separate containers.

Quick releases – those titanium ones are nice – but on past cruises they have become damaged, so having enough spares would be nice.

Releases on delicate moorings – the acoustic release took a couple of tries to release, this wasn't a problem. I am bringing this up because in the time it took to get it to release, we realized that it would be impossible to drag in our standard way for an instrument as delicate as a water sampler. I suggested to Phyllis/Geoff/Tim that perhaps a double release might be better insurance on moorings that would require an AUV to recover.

name	lab	status	UTC	depth(m)	ACTUAL LOCATION				comments		
					deg	min	deg	min			
AL19_AU_BS4a	MML	recovered	9/2/20 16:58	155.8	54	26.75	N	165	17.38	W	
AL20_AU_UN01b	MML	deployed	9/2/20 18:41	160	54	26.13	N	165	16.19	W	
AL19_AU_BS4b	MML	recovered	9/2/20 17:44	161	54	26.14	N	165	16.1	W	
PUF 3 s/n 2006	PMEL	deployed	9/3/20 0:18	130.1	55	13.97	N	166	7.98	W	
18BS-4B	PMEL	recovered	9/3/20 18:32	71.06	57	53.057	N	168	52.261	W	sbe16 0521 came up with broken pigtail cable, break was spotted at waterline before instrument was brought onboard. A small amount of nylon fishing line was tangled in the cage of the sbe16 and the cage of the ecofluorometer.
19BSP-4A	PMEL	recovered	9/3/20 19:45	71	57	51.944	N	168	52.139	W	
20BSP-4A	PMEL	deployed	9/3/20 21:19	71.3	57	51.894	N	168	52.759	W	
AL18_AU_BS9	MML	recovered	9/4/20 16:49	70.2	58	58.076	N	170	20.941	W	
AL19_AU_BS9	MML	recovered	9/4/20 17:25	70.7	58	57.829	N	170	22.333	W	
PUF 14 s/n 2008	PMEL	deployed	9/5/20 15:25	91	60	46.71	N	173	29.68	W	
PUF 15 s/n 2009	PMEL	deployed	9/6/20 2:51	140.9	61	4.19	N	177	46.32	W	
19-BSP-10A	PMEL	recovered	9/6/20 0:43	140	61	4.53	N	177	43.9	W	Mooring was only ADCP float, swivel, chain and release. No 30" steel float or sbe37 present.
SME-140	AFSC	recovered	9/6/20 2:23	140.2	61	4.545	N	177	45.714	W	recovered via small boat Peggy D.
SME-120	AFSC	recovered	9/6/20 5:50	120	61	22.487	N	177	10.75	W	recovered via small boat Peggy D.
SME-100	AFSC	recovered	9/6/20 17:19	100	61	50.94	N	176	16.51	W	recovered via small boat Peggy D.
SME-80	AFSC	recovered	9/6/20 22:06	80	62	17.352	N	175	22.539	W	recovered from NOAA's Oscar Dyson, seas too big for small boat ops.
19BSP-8A	PMEL	recovered	9/8/20 17:52	73.2	62	11	N	174	40	W	Bridge says that mooring is 1400ft from given location, No tubes found for EDD Biodegradable Drogue Fabric test.
20BSP-8A	PMEL	deployed	9/8/20 18:45	73.49	62	11.54	N	174	40.31	W	
AL19_AU_NM1	MML	recovered	9/10/20 0:30	44.7	64	51.29	N	168	23.41	W	
19CKP-12A	PMEL	recovered	9/11/20 1:51	59	67	54.84	N	168	11.83	W	
20CKP-12A	PMEL	deployed	9/11/20 2:52	59.3	67	54.82	N	168	11.83	W	
20CKITAER-12A(RAS)	PMEL	deployed	9/11/20 4:25	59.7	67	54.29	N	168	11.51	W	
C12PUF s/n 2001	PMEL	deployed	9/11/20 5:26	59.3	67	54.1	N	168	11.31	W	
sat-tracked drifter s/n 199997	PMEL	deployed	9/11/20 5:30	59.6	67	54.18	N	168	11.28	W	
sat-tracked drifter s/n 199999	PMEL	deployed	9/11/20 6:44	58.1	68	53.91	N	168	15.12	W	cruise plan originally had deployment at DBO 3-5, accidentally got mixed up with stations and deployed drifter at DBO 3-6 instead.
19CKP-1A	PMEL	recovered	9/12/20 16:52	45.2	70	50.26	N	163	7.32	W	
AL19_AU_IC1	MML	recovered	9/12/20 17:31	45.2	70	50.04	N	163	6.86	W	
AL20_AU_IC1	MML	deployed	9/12/20 18:15	45.3	70	50.16	N	163	7.1	W	Has Seaguard under AURAL; Needed to raise deckset volume to talk to release at 150m slant range.
19CKITAEP-2A (sinking FCOM)	PMEL	recovered	9/12/20 23:04	43	71	12.65	N	164	13.01	W	Prawler was at surface upon recovery. The 2 wires inside inductive breakout were stripped and broken. This was discovered shortly after unbolting inductive breakout plate as soon as the float was onboard.
19CKR-2A (RAS)	PMEL	recovered	9/12/20 22:09	45	71	12.92	N	164	14.76	W	one bottle had jumped out of the grid and wrapped itself around the upper frame of the RAS.
19CKP-2A	PMEL	recovered	9/13/20 0:00	45	71	13	N	164	14	W	
20CKP-2A	PMEL	deployed	9/13/20 1:27	44.5	71	13.18	N	164	14.83	W	
C2PUF s/n 2002	PMEL	deployed	9/13/20 2:38	44.03	71	13.64	N	164	16.21	W	
19CK-4A	PMEL	recovered	9/14/20 2:17	51.8	71	2.68	N	160	28.77	W	C4 recovery added post-departure
AL19_AU_BF2	MML	recovered	9/14/20 22:48	95.5	71	45.13	N	154	27.47	W	
AL20_AU_BF2	MML	deployed	9/14/20 23:16	102.4	71	45.22	N	154	28.07	W	
18NRS-1	PMEL	recovered	9/15/20 6:59	741	72	27.37	N	156	36.65	W	took multiple tries to release even though it responded (response was that it wasn't released)
20CKP-9A (1000)	PMEL	deployed	9/15/20 10:19	975	72	28.21	N	156	33.51	W	mooring was not provided according to diagram, mainly- 47 meters of nylon above Haruphone was swapped with 10 meters of nylon.
19CKP-3A	PMEL	cancelled	-	-	-	-	-	-	-	-	
AL19_AU_IC3	MML	cancelled	-	-	-	-	-	-	-	-	
AL20_AU_IC3	MML	cancelled	-	-	-	-	-	-	-	-	
AL19_AU_CL1	MML	recovered	9/11/20 20:25	50.8	69	19.062	N	167	36.737	W	
AL20_AU_CL1	MML	deployed	9/11/20 20:59	51	69	18.88	N	167	36.65	W	
20BSP-14A	PMEL	deployed	9/18/20 7:37	38.1	64	0.156	N	167	56.043	W	
20BSIP-14A	PMEL	deployed	9/18/20 7:19	38	63	59.95	N	167	55.69	W	5/8" SLS Pear Link was added below float for deployment pick point
AL19_AU_BS11	MML	recovered	9/19/20 3:23	50.1	61	4.83	N	170	16.83	W	sbe56 sn 04737 strapped to release
AL20_AU_BS11	MML	deployed	9/19/20 3:41	50.4	61	4.714	N	170	16.565	W	
PUF 12 s/n 2010	PMEL	deployed	9/19/20 7:24	62.4	60	41.995	N	171	6.256	W	
AL19_AU_BS2	MML	recovered	9/19/20 17:34	54.4	59	14.5	N	169	24.5	W	
PUF 16 s/n 2016	PMEL	deployed	9/19/20 17:41	54.9	59	14.7	N	169	24.5	W	
PUF 8 s/n 2007	PMEL	deployed	9/20/20 0:42	50.2	58	27.69	N	167	35.18	W	
AL19_AU_BS3	MML	cancelled	-	-	-	-	-	-	-	-	
19BSP-2B	PMEL	cancelled	-	-	-	-	-	-	-	-	
AL20_AU_PM02	MML	deployed	9/20/20 17:26	73.3	56	51.32	N	164	3.13	W	
19SH-1A	PMEL/MML	recovered	9/22/20 17:22	75.1	54	50.83	N	158	59.29	W	mooring diagram missing aural
20SH-1A	PMEL/MML	deployed	9/22/20 18:32	74.2	54	50.84	N	158	59.28	W	mooring diagram missing aural, see mooring diagram for changes- (assembled as the retrieved mooring appeared)
GA19_AU_BT1	MML	recovered	9/24/20 17:19	81.4	57	1.78	N	152	59.63	W	
GA20_AU_BT1	MML	deployed	9/24/20 17:46	81.5	57	1.79	N	152	59.62	W	