

# Appendix 13.9 Land-based Surveys and Theodolite Tracking

Chart 1: CWD Groups Sighted (per survey hour) and Tracked from Land-based Stations (prior to filtering data) Based on Time of Day



#### Station C - Airport West Station D - Sha Chau 1 Hour Survey Hour 0.9 0.9 Survey I 3.0 0.8 0.7 0.7 **Dolphin Group Sightings per** Dolphin Group Sightings per 0.6 0.6 0.5 0.5 0.4 0.4 0.3 0.3 0.2 0.2 0.1 0.1 0 15 10 13 16 10 11 12 13 14 15 (n=0) (n=3) (n=22) (n=22) (n=22) (n=19) (n=10) (n=3) (n=1) (n=19) (n=26) (n=26) (n=28) (n=28) (n=28) (n=21) (n=5) (n=2) (n=0) Time of Dav Time of Day

Notes: Time of Day indicates the hour block when the CWD Group was first sighted. The "n" in brackets represents the number of days that survey effort was carried out during the associated hour block.



Table 1: Dolphin sightings obtained from land-based tracking.

STATION A	DATE	<b># DOLPHIN GROUPS</b>
	6-Dec-12	4
	7-Dec-12	1
	11-Dec-12	1
	24-Dec-12	1
	2-Jan-13	1
	8-Jan-13	1
	21-Feb-13	1
	7-Mar-13	1
	12-Mar-13	1
	5-Jul-13	1
	30-Jul-13	3
	5-Aug-13	2
	2-Sep-13	1
	11-Sep-13	1
	26-Nov-13	2
STATION B	DATE	<b># DOLPHIN GROUPS</b>
	24-Dec-12	1
	29-Jan-13	1
	4-Feb-13	1
	4-Mar-13	3
	8-Mar-13	1
	6-Aug-13	1
	20-Aug-13	1
	6-Sep-13	2
STATION C	DATE	<b># DOLPHIN GROUPS</b>
	5-Nov-12	2
	29-Nov-12	3
	12-Dec-12	1
	14-Dec-12	1
	27-Dec-12	2
	3-Jan-13	2
	7-Jan-13	1
	16-Jan-13	1
	5-Feb-13	1
	13-Mar-13	2
	21-Mar-13	2
	28-Mar-13	2
	3-Jun-13	1
	5-Jul-13	2



	10-Jul-13	5
	29-Jul-13	2
	6-Aug-13	1
	4-Oct-13	1
	21-Nov-13	2
STATION D	DATE	<b># DOLPHIN GROUPS</b>
	12-Oct-12	3
	7-Nov-12	1
	14-Nov-12	3
	22-Nov-12	4
	22-Dec-12	1
	17-Jan-13	3
	21-Jan-13	1
	1-Feb-13	6
	16-Apr-13	2
	24-Apr-13	1
	13-May-13	2
	6-Jun-13	1
	18-Jun-13	1
	5-Aug-13	2
	9-Aug-13	5
	9-Sep-13	3
	18-Oct-13	2
	23-Oct-13	1
	6-Nov-13	1
	20-Nov-13	2

Table 2: Dolphin land-based survey results. Number of CWD groups after filtering.

Dolphin ID	Theo	Date	Time at	Time at	Duration	#
	Stn		<b>First Fix</b>	Last Fix	(hh:mm:ss)	Fixes
D41194Dolphin1	D	12-Oct-12	10:35:10 AM	10:48:27 AM	0:13:17	26
C41218Dolphin1	С	5-Nov-12	9:29:45 AM	9:40:44 AM	0:10:59	36
C41218Dolphin1s1	С	5-Nov-12	9:46:04 AM	10:04:46 AM	0:18:42	30
C41218Dolphin1s2	С	5-Nov-12	10:09:54 AM	10:51:31 AM	0:41:37	39
C41218Dolphin1s4	С	5-Nov-12	11:07:55 AM	11:26:07 AM	0:18:12	20
D41235Dolphin1	D	22-Nov-12	10:27:57 AM	10:46:15 AM	0:18:18	25
A41249Dolphin2	А	6-Dec-12	10:35:35 AM	10:47:29 AM	0:11:54	10
A41249Dolphin2s1	А	6-Dec-12	10:53:24 AM	11:07:15 AM	0:13:51	10
A41249Dolphin2s2	А	6-Dec-12	11:14:22 AM	11:29:17 AM	0:14:55	11
A41249Dolphin4	А	6-Dec-12	3:29:27 PM	3:41:35 PM	0:12:08	38
A41250Dolphin1s1	А	7-Dec-12	1:07:34 PM	1:20:03 PM	0:12:29	15
A41254Dolphin1	А	11-Dec-12	1:03:45 PM	1:13:58 PM	0:10:13	5
C41255Dolphin1s1	С	12-Dec-12	8:59:57 AM	9:43:56 AM	0:43:59	42
	Dolphin 1D           D41194Dolphin1           C41218Dolphin1           C41218Dolphin1s1           C41218Dolphin1s2           C41218Dolphin1s2           C41218Dolphin1s2           C41218Dolphin1s2           C41218Dolphin1s4           D41235Dolphin1           A41249Dolphin2s1           A41249Dolphin2s2           A41249Dolphin1s1           A41250Dolphin1s1           A41254Dolphin1s1           C41255Dolphin1s1	Dolphin ID         Theo Stn           D41194Dolphin1         D           C41218Dolphin1         C           C41218Dolphin1s1         C           C41218Dolphin1s2         C           C41218Dolphin1s2         C           C41218Dolphin1s2         C           C41218Dolphin1s2         C           C41218Dolphin1s4         C           D41235Dolphin1         D           A41249Dolphin2s1         A           A41249Dolphin2s2         A           A41249Dolphin4         A           A41250Dolphin1s1         A           A41254Dolphin1s1         A           C41255Dolphin1s1         C	Dolphin ID         Theo Stn         Date Stn           D41194Dolphin1         D         12-Oct-12           C41218Dolphin1         C         5-Nov-12           C41218Dolphin1s1         C         5-Nov-12           C41218Dolphin1s2         C         5-Nov-12           C41218Dolphin1s2         C         5-Nov-12           C41218Dolphin1s2         C         5-Nov-12           C41218Dolphin1s4         C         5-Nov-12           D41235Dolphin1         D         22-Nov-12           A41249Dolphin2         A         6-Dec-12           A41249Dolphin2s1         A         6-Dec-12           A41249Dolphin2s2         A         6-Dec-12           A41249Dolphin1s1         A         7-Dec-12           A41250Dolphin1s1         A         7-Dec-12           A41254Dolphin1s1         A         11-Dec-12           C41255Dolphin1s1         C         12-Dec-12	Dolphin ID         Theo         Date         Time at First Fix           D41194Dolphin1         D         12-Oct-12         10:35:10 AM           C41218Dolphin1         C         5-Nov-12         9:29:45 AM           C41218Dolphin1s1         C         5-Nov-12         9:29:45 AM           C41218Dolphin1s1         C         5-Nov-12         9:46:04 AM           C41218Dolphin1s2         C         5-Nov-12         10:09:54 AM           C41218Dolphin1s2         C         5-Nov-12         10:09:54 AM           C41218Dolphin1s4         C         5-Nov-12         10:09:54 AM           C41218Dolphin1s4         C         5-Nov-12         10:09:54 AM           D41235Dolphin1         D         22-Nov-12         10:27:57 AM           A41249Dolphin2         A         6-Dec-12         10:35:35 AM           A41249Dolphin2s1         A         6-Dec-12         10:53:24 AM           A41249Dolphin2s2         A         6-Dec-12         11:14:22 AM           A41249Dolphin1s1         A         7-Dec-12         1:07:34 PM           A41250Dolphin1s1         A         7-Dec-12         1:03:45 PM           C41255Dolphin1s1         C         12-Dec-12         8:59:57 AM	Dolphin IDTheoDateTime atTime atStnFirst FixLast FixD41194Dolphin1D12-Oct-1210:35:10 AM10:48:27 AMC41218Dolphin1C5-Nov-129:29:45 AM9:40:44 AMC41218Dolphin1s1C5-Nov-129:46:04 AM10:04:46 AMC41218Dolphin1s2C5-Nov-1210:09:54 AM10:51:31 AMC41218Dolphin1s2C5-Nov-1210:09:54 AM10:51:31 AMC41218Dolphin1s4C5-Nov-1211:07:55 AM11:26:07 AMD41235Dolphin1D22-Nov-1210:27:57 AM10:46:15 AMA41249Dolphin2A6-Dec-1210:35:35 AM10:47:29 AMA41249Dolphin2s1A6-Dec-1210:53:24 AM11:07:15 AMA41249Dolphin4A6-Dec-123:29:27 PM3:41:35 PMA41250Dolphin1s1A7-Dec-121:07:34 PM1:20:03 PMA41254Dolphin1A11-Dec-121:03:45 PM1:13:58 PMC41255Dolphin1s1C12-Dec-128:59:57 AM9:43:56 AM	Dolphin IDTheoDateTime atTime atDurationStnFirst FixLast Fix(hh:mm:ss)D41194Dolphin1D12-Oct-1210:35:10 AM10:48:27 AM0:13:17C41218Dolphin1C5-Nov-129:29:45 AM9:40:44 AM0:10:59C41218Dolphin1s1C5-Nov-129:46:04 AM10:04:46 AM0:18:42C41218Dolphin1s2C5-Nov-1210:09:54 AM10:51:31 AM0:41:37C41218Dolphin1s4C5-Nov-1211:07:55 AM11:26:07 AM0:18:12D41235Dolphin1D22-Nov-1210:27:57 AM10:46:15 AM0:18:18A41249Dolphin2A6-Dec-1210:35:35 AM10:47:29 AM0:11:54A41249Dolphin2s1A6-Dec-1211:14:22 AM11:07:15 AM0:13:51A41249Dolphin4A6-Dec-123:29:27 PM3:41:35 PM0:12:08A41250Dolphin1s1A7-Dec-121:03:45 PM1:13:58 PM0:10:13C41255Dolphin1A11-Dec-121:03:45 PM1:13:58 PM0:10:13

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14	C41255Dolphin1s2	С	12-Dec-12	9:49:37 AM	10:10:35 AM	0:20:58	15
15	C41255Dolphin1s6	С	12-Dec-12	11:32:39 AM	11:43:17 AM	0:10:38	7
16	C41255Dolphin1s12	С	12-Dec-12	12:52:29 PM	1:05:41 PM	0:13:12	20
17	C41257Dolphin1	С	14-Dec-12	10:30:48 AM	10:43:01 AM	0:12:13	38
18	A41267Dolphin1	А	24-Dec-12	9:32:55 AM	10:22:29 AM	0:49:34	62
19	C41270Dolphin1	С	27-Dec-12	8:57:13 AM	9:19:21 AM	0:22:08	41
20	A41276Dolphin1	А	2-Jan-13	2:23:41 PM	2:35:50 PM	0:12:09	39
21	C41277Dolphin1	С	3-Jan-13	8:30:12 AM	8:40:14 AM	0:10:02	25
22	C41277Dolphin2s1	С	3-Jan-13	9:05:01 AM	10:18:24 AM	1:13:23	230
23	C41281Dolphin1	С	7-Jan-13	8:48:34 AM	9:00:17 AM	0:11:43	11
24	A41282Dolphin1	А	8-Jan-13	12:25:07 PM	12:48:58 PM	0:23:51	46
25	C41290Dolphin1	С	16-Jan-13	9:15:57 AM	9:36:36 AM	0:20:39	43
26	B41303Dolphin1s1	В	29-Jan-13	10:52:11 AM	11:08:29 AM	0:16:18	21
27	D41306Dolphin2	D	1-Feb-13	12:39:53 PM	12:58:29 PM	0:18:36	31
28	D41306Dolphin2s1	D	1-Feb-13	1:30:39 PM	1:41:15 PM	0:10:36	11
29	D41306Dolphin2s2	D	1-Feb-13	1:52:55 PM	2:08:22 PM	0:15:27	55
30	D41306Dolphin4	D	1-Feb-13	2:15:07 PM	2:29:14 PM	0:14:07	8
31	D41306Dolphin6	D	1-Feb-13	2:46:06 PM	3:18:39 PM	0:32:33	76
32	A41326Dolphin1	А	21-Feb-13	12:06:04 PM	12:22:28 PM	0:16:24	14
33	A41326Dolphin1s3	А	21-Feb-13	1:01:07 PM	1:14:18 PM	0:13:11	17
34	A41326Dolphin1s5	А	21-Feb-13	1:48:18 PM	2:07:22 PM	0:19:04	17
35	B41337Dolphin1s1	В	4-Mar-13	11:22:16 AM	11:36:09 AM	0:13:53	18
36	B41337Dolphin3	В	4-Mar-13	12:28:24 PM	12:55:13 PM	0:26:49	31
37	B41341Dolphin1	В	8-Mar-13	11:53:43 AM	12:05:24 PM	0:11:41	13
38	C41346Dolphin1	С	13-Mar-13	9:45:57 AM	10:20:37 AM	0:34:40	88
39	C41346Dolphin2s2	С	13-Mar-13	10:43:52 AM	11:20:55 AM	0:37:03	88
40	C41354Dolphin2s1	С	21-Mar-13	9:44:13 AM	9:56:22 AM	0:12:09	10
41	C41361Dolphin2	С	28-Mar-13	3:33:36 PM	3:48:49 PM	0:15:13	35
42	D41388Dolphin1	D	24-Apr-13	12:59:55 PM	1:50:16 PM	0:50:21	52
43	D41407Dolphin2	D	13-May-13	1:29:38 PM	1:41:00 PM	0:11:22	14
44	C41428Dolphin1	С	3-Jun-13	8:45:31 AM	9:07:43 AM	0:22:12	44
45	C41428Dolphin1s3	С	3-Jun-13	9:41:20 AM	9:52:59 AM	0:11:39	25
46	D41443Dolphin1	D	18-Jun-13	12:33:18 PM	1:03:32 PM	0:30:14	66
47	D41443Dolphin1a	D	18-Jun-13	1:27:29 PM	1:42:18 PM	0:14:49	28
48	C41460Dolphin1	С	5-Jul-13	9:20:20 AM	9:38:24 AM	0:18:04	21
49	A41460Dolphin1	А	5-Jul-13	9:39:14 AM	9:55:40 AM	0:16:26	20
50	C41460Dolphin2s1	С	5-Jul-13	9:42:50 AM	10:10:20 AM	0:27:30	51
51	C41460Dolphin2s2	С	5-Jul-13	10:17:13 AM	10:46:50 AM	0:29:37	20
52	C41460Dolphin2s6	С	5-Jul-13	11:48:04 AM	11:59:07 AM	0:11:03	24
53	C41465Dolphin1s1	С	10-Jul-13	9:35:44 AM	9:47:02 AM	0:11:18	19
54	C41465Dolphin2	С	10-Jul-13	9:42:03 AM	10:08:46 AM	0:26:43	24

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55	C41484Dolphin1as1	С	29-Jul-13	9:33:45 AM	9:47:20 AM	0:13:35	21
56	C41484Dolphin2s2	С	29-Jul-13	11:13:14 AM	11:26:53 AM	0:13:39	12
57	A41485Dolphin1	А	30-Jul-13	12:30:46 PM	12:46:01 PM	0:15:15	17
58	D41491Dolphin2A	D	5-Aug-13	11:47:08 AM	12:08:27 PM	0:21:19	40
59	C41492Dolphin1s1	С	6-Aug-13	9:25:15 AM	9:41:46 AM	0:16:31	13
60	B41492Dolphin1	В	6-Aug-13	10:16:07 AM	10:26:30 AM	0:10:23	18
61	D41495Dolphin5	D	9-Aug-13	3:44:53 PM	3:57:04 PM	0:12:11	21
62	B41506Dolphin1	В	20-Aug-13	9:47:38 AM	10:05:14 AM	0:17:36	14
63	B41523Dolphin2	В	6-Sep-13	1:32:36 PM	2:13:28 PM	0:40:52	54
64	D41526Dolphin3	D	9-Sep-13	3:10:46 PM	3:29:44 PM	0:18:58	27
65	D41526Dolphin3a	D	9-Sep-13	3:35:34 PM	3:48:16 PM	0:12:42	19
66	C41551Dolphin1	С	4-Oct-13	8:56:51 AM	9:07:41 AM	0:10:50	12
67	D41565Dolphin2s2	D	18-Oct-13	12:54:30 PM	1:14:44 PM	0:20:14	27
68	C41599Dolphin1s1	С	21-Nov-13	9:51:58 AM	10:12:02 AM	0:20:04	21
69	A41604Dolphin1	А	26-Nov-13	1:03:18 PM	2:14:08 PM	1:10:50	143

Table 3: Number of CWD 10-minute segments after auto-correlation.

	<b>Dolphin ID</b>	Theo	Date Time at First		Time at Last
		Stn		Fix	Fix
1	D411941_	D	12-Oct-12	10:35:10 AM	10:45:10 AM
2	C412181_	С	5-Nov-12	9:29:45 AM	9:39:45 AM
3	C412181_s1	С	5-Nov-12	9:46:04 AM	9:56:04 AM
4	C412181_s2	С	5-Nov-12	10:09:54 AM	10:19:54 AM
5	C412181_s4	С	5-Nov-12	11:07:55 AM	11:17:55 AM
6	D412351_	D	22-Nov-12	10:27:57 AM	10:37:57 AM
7	A412492_	А	6-Dec-12	10:35:35 AM	10:45:35 AM
8	A412492_s1	А	6-Dec-12	10:53:24 AM	11:03:24 AM
9	A412492_s2	А	6-Dec-12	11:14:22 AM	11:24:22 AM
10	A412494_	А	6-Dec-12	3:29:27 PM	3:39:27 PM
11	A412501_s1	А	7-Dec-12	1:07:34 PM	1:17:34 PM
12	A412541_	А	11-Dec-12	1:03:45 PM	1:13:45 PM
13	C412551_s1	С	12-Dec-12	8:59:57 AM	9:09:57 AM
14	C412551_s2	С	12-Dec-12	9:49:37 AM	9:59:37 AM
15	C412551_s6	С	12-Dec-12	11:32:39 AM	11:42:39 AM
16	C412551_s12	С	12-Dec-12	12:52:29 PM	1:02:29 PM
17	C412571_	С	14-Dec-12	10:30:48 AM	10:40:48 AM
18	A412671_	А	24-Dec-12	9:32:55 AM	9:42:55 AM
19	A412671_b3	А	24-Dec-12	10:08:55 AM	10:18:55 AM
20	C412701_	С	27-Dec-12	8:57:13 AM	9:07:13 AM
21	A412761_	А	2-Jan-13	2:23:41 PM	2:33:41 PM
22	C412771_	С	3-Jan-13	8:30:12 AM	8:40:12 AM
23	C412772_s1	С	3-Jan-13	9:05:01 AM	9:15:01 AM

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24	C412772_s1b3	С	3-Jan-13	9:41:01 AM	9:51:01 AM
25	C412811_	С	7-Jan-13	8:48:34 AM	8:58:34 AM
26	A412821_	А	8-Jan-13	12:25:07 PM	12:35:07 PM
27	C412901_	С	16-Jan-13	9:15:57 AM	9:25:57 AM
28	B413031_s1	В	29-Jan-13	10:52:11 AM	11:02:11 AM
29	D413062_	D	1-Feb-13	12:39:53 PM	12:49:53 PM
30	D413062_s1	D	1-Feb-13	1:30:39 PM	1:40:39 PM
31	D413062_s2	D	1-Feb-13	1:52:55 PM	2:02:55 PM
32	D413064_	D	1-Feb-13	2:15:07 PM	2:25:07 PM
33	D413066_	D	1-Feb-13	2:46:06 PM	2:56:06 PM
34	A413261_	А	21-Feb-13	12:06:04 PM	12:16:04 PM
35	A413261_s3	А	21-Feb-13	1:01:07 PM	1:11:07 PM
36	A413261_s5	А	21-Feb-13	1:48:18 PM	1:58:18 PM
37	B413371_s1	В	4-Mar-13	11:22:16 AM	11:32:16 AM
38	B413373_	В	4-Mar-13	12:28:24 PM	12:38:24 PM
39	B413411_	В	8-Mar-13	11:53:43 AM	12:03:43 PM
40	C413461_	С	13-Mar-13	9:45:57 AM	9:55:57 AM
41	C413462_s2	С	13-Mar-13	10:43:52 AM	10:53:52 AM
42	C413542_s1	С	21-Mar-13	9:44:13 AM	9:54:13 AM
43	C413612_	С	28-Mar-13	3:33:36 PM	3:43:36 PM
44	D413881_	D	24-Apr-13	12:59:55 PM	1:09:55 PM
45	D413881_b3	D	24-Apr-13	1:35:55 PM	1:45:55 PM
46	D414072_	D	13-May-13	1:29:38 PM	1:39:38 PM
47	C414281_	С	3-Jun-13	8:45:31 AM	8:55:31 AM
48	C414281_b1	С	3-Jun-13	8:57:31 AM	9:07:31 AM
49	C414281_s3	С	3-Jun-13	9:41:20 AM	9:51:20 AM
50	C414281_s3b3	С	3-Jun-13	10:17:20 AM	10:27:20 AM
51	D414431_	D	18-Jun-13	12:33:18 PM	12:43:18 PM
52	D414431a_	D	18-Jun-13	1:27:29 PM	1:37:29 PM
53	C414601_	С	5-Jul-13	9:20:20 AM	9:30:20 AM
54	A414601_	А	5-Jul-13	9:39:14 AM	9:49:14 AM
55	C414602_s1	С	5-Jul-13	9:42:50 AM	9:52:50 AM
56	C414602_s2	С	5-Jul-13	10:17:13 AM	10:27:13 AM
57	C414602_s6	С	5-Jul-13	11:48:04 AM	11:58:04 AM
58	C414651_s1	С	10-Jul-13	9:35:44 AM	9:45:44 AM
59	C414652_	С	10-Jul-13	9:42:03 AM	9:52:03 AM
60	C414841a_s1	С	29-Jul-13	9:33:45 AM	9:43:45 AM
61	C414842_s2	С	29-Jul-13	11:13:14 AM	11:23:14 AM
62	A414851_	А	30-Jul-13	12:30:46 PM	12:40:46 PM
63	D414912A_	D	5-Aug-13	11:47:08 AM	11:57:08 AM
64	C414921_s1	С	6-Aug-13	9:25:15 AM	9:35:15 AM

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65	B414921_	В	6-Aug-13	10:16:07 AM	10:26:07 AM
66	D414955_	D	9-Aug-13	3:44:53 PM	3:54:53 PM
67	B415061_	В	20-Aug-13	9:47:38 AM	9:57:38 AM
68	B415232_	В	6-Sep-13	1:32:36 PM	1:42:36 PM
69	D415263_	D	9-Sep-13	3:10:46 PM	3:20:46 PM
70	D415263a_	D	9-Sep-13	3:35:34 PM	3:45:34 PM
71	C415511_	С	4-Oct-13	9:06:51 AM	9:16:51 AM
72	D415652_s2	D	18-Oct-13	1:04:30 PM	1:14:30 PM
73	C415991_s1	С	21-Nov-13	10:01:58 AM	10:11:58 AM
74	A416041_b5	А	26-Nov-13	2:13:18 PM	2:23:18 PM
75	A416041_b1	А	26-Nov-13	1:25:18 PM	1:35:18 PM
76	A416041_b2	А	26-Nov-13	1:37:18 PM	1:47:18 PM
77	A416041_	А	26-Nov-13	1:13:18 PM	1:23:18 PM
78	A416041_b3	А	26-Nov-13	1:49:18 PM	1:59:18 PM
79	A416041_b4	А	26-Nov-13	2:01:18 PM	2:11:18 PM



Chart 2. Autocorrelation of movement data: prior to filtering (top) and after filtering (bottom). The autocorrelation coefficient is measured at different lags, with lag 1 equating to the correlation between two successive segments within the same group (e.g. lag 1 = 10 minutes after first observation, lag 2 = 20 minutes, etc.).

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### Statistical Analyses

Sample sizes were unequal and the response variables violated assumptions of linear modelling including normally distributed residuals (**Table 4**). To correct for non-normal distributions, data were transformed. Square root transformations were applied to the speed and reorientation variables and because linearity contains values between 0 and 1, an empirical logit transformation was applied (**Table 4**). Overall, unequal sample sizes over seasons do not invalidate statistical analyses of movement types, as long as enough data are present for valid comparisons per spatial and temporal scales.

#### Table 4 Shapiro-Wilk Test for Normality

Response Variable	n	SHAPIRO-WILK	P-Value	Transformed P-Value
Swimming Speed	79	0.9124	4.716e-05	0.3448
Reorientation Rate	79	0.8896	5.13e-06	0.0905
Linearity	79	0.8718	1.07e-06	0.2262

#### Swimming Speed

 Table 5:
 Mean CWD Swimming Speed (km/hr), based on Natural Factors and Vessel Presence

Season and Vessel Presence	n	Mean	Standard Deviation	Minimum	Maximum
Solar Season					
Autumn	26	2.131	1.340	0.464	5.143
Winter	24	1.968	0.947	0.500	3.718
Spring	11	1.906	1.539	0.614	4.902
Summer	18	2.514	1.299	0.671	5.492
Vessels Present	27	2.231	1.226	0.671	5.143
Morning	5	2.485	1.203	1.052	3.921
Midday	19	2.222	1.331	0.671	5.143
Afternoon	3	1.867	0.569	1.489	2.521
High Speed Ferry Presence	5	2.300	1.121	1.268	4.137
No Vessels	52	2.089	1.270	0.464	5.492
Morning	21	1.772	1.076	0.614	4.902
Midday	25	2.431	1.374	0.464	5.492
Afternoon	6	1.768	1.276	0.540	3.377
Station A	12	2.315	1.467	0.500	4.761
Station B	4	3.595	1.708	1.442	5.49
Station C	25	1.709	1.024	0.464	4.902
Station D	11	2.156	1.063	0.798	4.161



The term "n" is the sample size, i.e. number of 10 min. sections extracted from overall CWD movement data that met the appropriate criteria.

Chart 3: Variation in Mean CWD Swimming Speed (transformed) Based on Vessel Presence

Swimming speed based on general vessel presence (left, one-way ANOVA p-value = 0.5418) and on high speed ferry presence (right, one-way ANOVA p-value = 0.6523).



Boxes represent 25th and 75th percentiles, horizontal lines in boxes represent 50th percentile; whiskers represent 10th and 90th percentiles; closed diamonds represent means.

Chart 4: Natural Variation in Mean CWD Swimming Speed (transformed) with No Vessels Present

Top Left: Area of Observation (one-way ANOVA p-value = 0.0572) Top Right: Time of Day (one-way ANOVA p-value = 0.1705) Bottom Left: Solar Season (one-way ANOVA p-value = 0.2732) Bottom Right: Oceanographic Season (one-way ANOVA p-value = 0.4780)





Boxes represent 25th and 75th percentiles, horizontal lines in boxes represent 50th percentile; whiskers represent 10th and 90th percentiles; open circles represent outliers; closed diamonds represent means.

#### **Reorientation Rate**

Table 6: Mean Dolphin Reorientation Rate based on Natural Factors and Vessel Presence.

Season and Vessel Presence	n	Mean	Standard Deviation	Minimum	Maximum
Solar Season					
Autumn	26	35.969	26.268	1.145	105.986
Winter	24	20.931	13.863	3.162	53.040
Spring	11	25.034	13.468	4.235	41.002
Summer	18	23.594	14.897	3.054	57.155

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Season and Vessel Presence	n	Mean	Standard Deviation	Minimum	Maximum
Vessels Present	27	31.743	21.153	4.285	87.333
Morning	5	17.370	7.365	7.742	26.667
Midday	19	37.039	22.959	4.285	87.333
Afternoon	3	22.159	6.627	14.508	26.045
High Speed Ferry Presence	5	36.150	18.749	16.863	58.378
No Vessels	52	24.626	18.760	1.145	105.986
Morning	21	26.638	15.792	3.544	60.355
Midday	25	23.978	22.147	1.145	105.986
Afternoon	6	20.283	14.007	3.162	37.789
Station A	12	28.890	29.620	1.145	105.986
Station B	4	26.110	19.467	3.054	44.501
Station C	25	25.884	13.195	5.273	60.355
Station D	11	16.576	14.155	3.162	38.167

The term "n" is the sample size, i.e. number of 10 min. sections extracted from overall CWD movement data that met the appropriate

Chart 5: Variation in dolphin reorientation rate based on vessel presence.

Reorientation rate (transformed) based on general vessel presence (left, one-way ANOVA p-value = 0.0957) and on high speed ferry presence (right, one-way ANOVA p-value = 0.2252).



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Boxes represent 25th and 75th percentiles, horizontal lines in boxes represent 50th percentile; whiskers represent 10th and 90th percentiles; open circles represent outliers; closed diamonds represent means. The term "n" is the sample size, i.e. number of 10 min. sections extracted from overall CWD movement data that met the appropriate criteria.

Chart 6: Natural Variation in CWD Reorientation Rate (transformed) with No Vessels Present

Top Left: Area of Observation (one-way ANOVA p-value = 0.3703) Top Right: Time of Day (one-way ANOVA p-value = 0.6262) Bottom Left: Solar Season (one-way ANOVA p-value = 0.6459) Bottom Right: Oceanographic Season (one-way ANOVA p-value = 0.9254)





Boxes represent 25th and 75th percentiles, horizontal lines in boxes represent 50th percentile; whiskers represent10th and 90th percentiles; open circles represent outliers; closed diamonds represent means. The term "n" is the sample size, i.e. number of 10 min. sections extracted from overall CWD movement data that met the appropriate criteria.

#### Linear Movement

Season and Vessel Presence	n	Mean	Standard Deviation	Minimum	Maximum
Solar Season					
Autumn	26	0.571	0.304	0.060	0.999
Winter	24	0.722	0.316	0.102	0.991
Spring	11	0.560	0.387	0.108	0.975
Summer	18	0.752	0.222	0.090	0.994
Vessels Present	27	0.603	0.320	0.060	0.973
Morning	5	0.749	0.328	0.176	0.972
Midday	19	0.537	0.330	0.060	0.973
Afternoon	3	0.772	0.012	0.755	0.787
High Speed Ferry Presence	5	0.616	0.226	0.313	0.846
No Vessels	52	0.685	0.304	0.091	0.999
Morning	21	0.655	0.334	0.091	0.981
Midday	25	0.675	0.301	0.117	0.998
Afternoon	6	0.831	0.172	0.543	0.991
Station A	12	0.671	0.318	0.113	0.999
Station B	4	0.574	0.361	0.117	0.994
Station C	25	0.653	0.310	0.091	0.981
Station D	11	0.812	0.254	0.173	0.993

## Table 7: Mean CWD Linearity Based on Natural Factors and Vessel Presence.



The term "n" is the sample size, i.e. number of 10 min. sections extracted from overall CWD movement data that met the appropriate criteria.

#### Chart 7: Variation in CWD Linear Movement (empirical logit transformed) Based on Vessel Presence

Linearity based on general vessel presence (left, one-way ANOVA p-value = 0.1215) and on high speed ferry presence (right, one-way ANOVA p-value = 0.5125).



Boxes represent 25th and 75th percentiles, horizontal lines in boxes represent 50th percentile; whiskers represent 10th and 90th percentiles; open circles represent outliers; closed diamonds represent means. The term "n" is the sample size, i.e. number of 10 min. sections extracted from overall CWD movement data that met the appropriate criteria.



Chart 8: Natural variation in CWD Linear Movement (empirical logit transformed) with No Vessels Present

Top Left: Area of Observation (one-way ANOVA p-value = 0.3027) Top Right: Time of Day (one-way ANOVA p-value = 0.5131) Bottom Left: Solar Season (one-way ANOVA p-value = 0.3953) Bottom Right: Oceanographic Season (one-way ANOVA p-value = 0.8444)



Boxes represent 25th and 75th percentiles, horizontal lines in boxes represent 50th percentile; whiskers represent 10th and 90th percentiles; open circles represent outliers; closed diamonds represent means. The term "n" is the sample size, i.e. number of 10 min. sections extracted from overall CWD movement data that met the appropriate criteria

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