

RESEARCH VESSEL SURVEY REPORT

**RV CEFAS ENDEAVOUR
Survey: C END 02 - 2020**

STAFF:

Name	Role	Name	Role
Marc Whybrow	SIC	Malgorzata Wilczynska	Moorings Support
Naomi Greenwood	2IC	Bryan Goodsir-Thompson	Moorings
Oliver Twigge	Moorings Lead	Uwe Posner	FerryBox
Eleanor Haigh	Water Sampling Lead	Sven Drechsler	FerryBox
Isobel Lake	Water Sampling		
Caroline Whybrow	Water Sampling		
Dave Pearce	Deck Lead		

DURATION: 3rd February – 8th February

LOCATION: North Sea

AIMS:

1. Service Noise Landers at Dowsing, Warp (SLA20A 1 day)
2. Service SmartBuoys at West Gabbard 2 and Warp (SLA25SD 2 days)
3. Collection of Zooplankton sample at West Gabbard
4. Service Waveriders at Firth of Forth, Tyne/Tees, Torness and South Knock (C6029A 3 days). Continuous flow and CTD Rosette water sampling

NARRATIVE:

Monday 3rd February

Pilot onboard at 00:00hrs and all ropes let go at 00:00hrs, arrived at pilot drop off station and he disembarked at 00:55hrs.

We got ourselves underway towards the South Knock Waverider site, during the transit we collected 4 Underway water samples.

01:02hrs (52° 28.170N - 01° 46.835E), depth 12 meters, 03:04hrs (52° 07.316N - 01° 46.591E), depth 30 meters, 05:04hrs (51° 47.443N - 01° 46.460E), depth 38 meters, 06:56hrs (51° 35.655N - 01° 38.973E), depth 28 meters.

All collecting, all taking Salinity, Chlorophyll, Nutrients, Suspended Particulate Matter, TA/DIC and CDOM

We arrived at the South Knock Waverider station and carried out a ToolBox talk on the recovery and deployment of Waveriders.

Waverider hooked at 08:17hrs (51° 34.2476N - 01° 34.7624E), depth 27 meters, on deck at 08:18hrs.

Clump weight on deck at 08:35hrs (51° 34.2379N – 01° 34.7368E), depth 26 meters.

Moved back into position and deployed the serviced Waverider.

Waverider released at 09:09hrs (51° 34.223N – 01° 34.675E), depth 26 meters, clump weight

released at 09:11hrs (51° 34.223N – 01° 34.675E), depth 26 meters.

South Knock survey site completed.

During the transit we collected 2 Underway water samples. 09:29hrs (51° 35.155N – 01° 39.021E), depth 26 meters. 14:32hrs (51° 57.365N - 02° 07.749E) Collecting Salinity, Chlorophyll, Nutrients, Suspended Particulate Matter, TA/DIC and CDOM. On the second collection we also collected O₂.

Arrived at the West Gabbard 2 survey area, pre-ESM2 deployed at 14:48hrs (51° 57.334N – 02° 07.756E).

Vessel moved into position for the SmartBuoy recovery and we hooked in at 15:27hrs (51° 57.209N – 02° 6.620E), depth 41 meters, on deck at 15:28hrs. Clump weight on deck at 15:34hrs (51° 57.2185N – 02° 6.611E), depth 41 meters.

Moved back into position and deployed the serviced SmartBuoy, 16:07hrs (51° 57.245N – 02° 6.655E), depth 41 meters. Clump weight released at 16:09hrs (51° 57.256N – 02° 6.677E), depth 41 meters. Post ESM2 sample collected at 16:35 (51° 57.087N - 02° 07.519E, collecting Salinity, Chlorophyll, Nutrients, Suspended Particulate Matter, O₂.

Extra water samples collection within the West Gabbard 2 survey area.

18:03hrs (51° 57.167N - 02° 07.176E), depth 44 meters. 19:31hrs (51° 57.124N - 02° 07.209E), 21:03hrs (51° 57.111N - 02° 07.060E), depth 43 meters. 22:33hrs (51° 57.122N - 02° 07.338E), depth 42 meters. Collecting Salinity, Chlorophyll, Nutrients, Suspended Particulate Matter, TA/DIC and CDOM

Zooplankton sample collected at 18:50hrs (51° 57.124N - 02° 07.307E), depth 43 meters

Tuesday 4th February

Continuing to collect underway water samples within the West Gabbard 2 survey area.

00:00hrs (51° 57.141N - 02° 7.256E), depth 42 meters. 01:28hrs (51° 57.088N - 02° 07.032E), depth 42 meters. Collecting Salinity, Chlorophyll, Nutrients, Suspended Particulate Matter, TA/DIC and CDOM

Left West Gabbard 2 survey site and started to make our way to the Warp.

On the way we collected underway water samples. 02:31hrs (51° 51.464N - 01° 59.331E), depth 31 meters. 03:30hrs (51° 50.716N - 01° 44.578E), depth 33 meters. 04:40hrs (51° 46.237N - 01° 27.529E), depth 24 meters. 05:39hrs (51° 39.702N - 01° 16.444E), depth 19 meters. Collecting Salinity, Chlorophyll, Nutrients, Suspended Particulate Matter, TA/DIC and CDOM.

Arrived on station and collected the Pre-Warp water sample and ESM2 profile. 07:08 (51° 31.652N - 01° 02.417E), depth 17 meters, collecting Phyto, Salinity, Chlorophyll, Nutrients, Suspended Particulate Matter, TA/DIC, CDOM and O₂.

We then got setup alongside the SmartBuoy and hooked in at 08:07hrs (51° 32.0138N - 01° 2.9789E), depth 19 meters, SmartBuoy on deck at 08:09hrs. Clump weight recovered at 08:13hrs (51° 32.0075N - 01° 2.9720E), depth 19 meters.

We then moved into position to recover the Warp Noise Lander, hooked clump weight buff line at 08:29hrs (51° 32.0135N - 01° 2.2850E), depth 20 meters. Lander recovered at 08:52hrs (51° 31.9513N - 01° 2.8658E, depth 20 meters.

Moved back into position and deployed the Noise Lander. Released at 09:29hrs (51° 31.946N – 01° 2.804E), depth 20 meters. We then released the clump weight at 09:50hrs (51° 32.004N – 01° 2.738E), depth 15 meters.

We then moved into position for the SmartBuoy deployment. SmartBuoy released at 10:19hrs (51° 32.010N – 01° 2.896E), depth 19 meters. Clump weight released at 10:19hrs (51° 32.010N – 01° 2.895E), depth 19 meters.

We then collected the Post-Warp water sample and ESM2 profile at 10:27hrs (51° 31.889N – 01° 02.879E), collecting Salinity, Chlorophyll, Nutrients, Suspended Particulate Matter, TA/DIC, CDOM and O₂.

We then set off and made our way to the two Off Great Yarmouth water stations, during the transit we collected underway water samples.

12:31hrs (51° 45.730N - 01° 24.965E), depth 23m. 13:34hrs (51° 54.430N - 01° 33.7555E), depth 17 meters. 14:30hrs (51° 2.989N - 01° 31.215E), depth 11 meters. 15:32hrs (52° 11.560N - 01° 41.075E), depth 19 meters. 16:30hrs (52° 21.322N - 01° 46.080E), depth 21 meters. Collecting at all Salinity, Chlorophyll, Nutrients, Suspended Particulate Matter, TA/DIC, CDOM.

Arrived at the Off Great Yarmouth water stations, water samples taken at 17:47hrs (52° 34.415N - 01° 46.137E), depth 16 meters, collecting Salinity, Chlorophyll, Nutrients, Suspended Particulate Matter, CDOM. Off Great Yarmouth 2 at 18:20hrs (52° 36.088N - 01° 45.982E), only CDOM collected.

We then continued to make our way to the Wash water stations again collecting underway water samples. 20:30hrs (52° 52.865N - 01° 32.349E), depth 23 meters. 22:29hrs (53° 3.370N - 01° 4.040E), depth 20 meters. All collecting Salinity, Chlorophyll, Nutrients, Suspended Particulate Matter, TA/DIC, CDOM.

Wednesday 5th February

Continue to collect underway water samples during the transit towards the wash.

00:37hrs (53° 13.400N - 0° 40.007E), depth 23 meters. Collecting Salinity, Chlorophyll, Nutrients, Suspended Particulate Matter, TA/DIC, CDOM.

Arrived at the outer Wash station and collected the water sample and deployed the ESM2 at 01:47hrs (53° 3.514N - 0° 28.946E), depth 36 meters. Underway sample between Outer to Inner Wash collected at 02:40hrs (53° 0.941N - 0° 25.705E), depth 28 meters. Inner wash sample with the ESM2 at 03:52hrs (52° 57.444N - 0° 21.088E), depth 20 meters. All collecting Salinity, Chlorophyll, Nutrients, Suspended Particulate Matter, TA/DIC, CDOM.

We then transited towards the Humber water station and on the way collected underway samples. 05:16hrs (53° 8.487N - 0° 34.062E), depth 29 meters. 06:23hrs (53° 20.099N - 0° 35.571E) We arrived at the Humber and deployed the ESM2 07:55hrs (53° 51.952N - 0° 20.011E), depth 12 meters. All collecting Salinity, Chlorophyll, Nutrients, Suspended Particulate Matter, TA/DIC, CDOM.

We then transited towards the Dowsing Lander survey area. Clump weight buff hooked at 10:57hrs (53° 31.795N – 01° 3.279E), depth 22 meters, on deck 11:04hrs. Noise Lander recovered at 11:16hrs (53° 31.746N – 01° 3.209E), depth 22 meters.

Moved back into position and deployed the serviced Lander at 11:53hrs (53° 31.737N – 01° 3.208E), depth 22 meters, clump weight released at 12:23hrs (53° 31.772N – 01° 3.322E), depth 23 meters.

ESM2 deployed at 13:31hrs (53° 31.591N – 01° 04.315E), depth 23 meters.

Dowsing survey area completed.

During the deployed of the clump weight we ran into an issue with the single net drum, where the brake was smoking, as we were halfway through deploying, we had to un-wrap the rest of the rope from the net drum by hand.

Engineers estimate 2 to 3 hours to repair.

Single net drum repaired and back in action at 15:30hrs

Underway towards Firth of Forth Waverider, during the transits we collected underway water samples. 15:31hrs, (53° 47.667N – 0° 38.686E), depth 34 meters. 17:32hrs (54° 06.292N - 0° 09.044E) depth 54 meters. 18:30hrs (54° 15.536N - 0° 5.700W), depth 53 meters. 19:30hrs (54° 24.724N - 0° 22.322W), depth 50 meters. 20:30hrs (54° 34.409N - 0° 38.717W), depth 46 meters. 21:29hrs (54° 40.470N - 0° 56.074W), depth 46 meters. 22:30hrs (54° 51.040N - 1° 7.882W), depth 49 meters. 23:30hrs (55° 1.599N - 1° 17.409W), depth 48 meters.

All collecting Salinity, Chlorophyll, Nutrients, Suspended Particulate Matter, TA/DIC, CDOM.

Thursday 6th February

Continued to collect underway water stations on the way to Firth of Forth. 00:35hrs (55° 14.549N - 1° 25.407W), depth 51 meters. 01:32hrs (55° 25.864N - 01° 28.314W), depth 48 meters. 02:32hrs (55° 38.030N - 1° 34.002W), depth 44 meters. 03:32hrs (55° 47.371N - 1° 48.155W), depth 74 meters. 04:32hrs (55° 56.562N - 02° 04.411W), depth 74 meters. 05:32hrs (56° 04.170N - 02° 17.537W), depth 54 meters. 06:59hrs (56° 10.722N - 02° 29.610W), depth 67 meters. All collecting Salinity, Chlorophyll, Nutrients, Suspended Particulate Matter, TA/DIC, CDOM.

Arrived at the Firth of Forth survey area and located the Waverider. Hooked in at 07:56hrs (56° 11.272N - 02° 30.301W), depth 62 meters, on deck at 07:57hrs. Clump weight recovered at 08:07hrs (56° 11.267N - 02° 30.245W) 61 meters.

Moved back in to position and deployed the serviced Waverider.

Waverider released at 08:46hrs (56° 11.261N - 02° 30.253W), depth 62 meters. Clump weight released at 08:49hrs (56° 11.260N - 02° 30.288W), depth 62 meters.

Survey area completed and we made our way to the Torness Waverider survey area.

Arrived at the Torness survey area, hooked the Guard Buoy at 10:13hrs (55° 58.769N - 02° 24.411W), depth 15 meters. Clump weight recovered at 10:21hrs (55° 58.771N - 02° 24.416W), depth 15 meters.

Moved into position and hooked the Waverider at 10:39hrs (55° 58.769N - 02° 24.484W), depth 17 meters. Clump weight recovered at 10:49hrs (55° 58.775N - 02° 24.512W), depth 18 meters.

Moved back into the Guard Buoy position and deployed the serviced Buoy at 11:11hrs (55° 58.7864N - 02° 24.498W), depth 19 meters. Clump weight released at 11:12hrs (55° 58.786N - 02° 24.500W), depth 19 meters.

Move to the Waverider position and release it at 11:27hrs (55° 58.790N - 02° 24.594W), depth 19 meters. Clump weight released at 11:28hrs (55° 58.790N - 02° 24.595W), depth 19 meters. Torness survey area completed.

We then got underway and transited to the Tyne/Tees survey area.

During the transit we collected Underway water samples.

11:45hrs (55° 59.466N - 02° 21.470W), depth 45 meters. 13:00hrs (55° 53.257N - 02° 21.470W), depth 66 meters. 14:00hrs (55° 42.651N - 01° 40.929W), depth 63 meters. 15:00hrs (55° 32.342N - 01° 26.180W), depth 67 meters. 16:00hrs (55° 19.910N - 01° 20.424W), depth 55 meters. All collecting Salinity, Chlorophyll, Nutrients, TA/DIC, CDOM.

Arrived at the Off Tyne water station and deployed the CTD at 17:43hrs (55° 0.214N - 01° 08.155W), depth 68 meters. Collecting Salinity, Chlorophyll, Nutrients

We also deployed the new EMSX profiler at 18:06hrs (55° 0.569N - 01° 8.133W).

We then transited to the Tyne/Tees Waverider. Got into position for the Waverider and hooked in at 20:01hrs (54° 55.199N – 00° 44.987W), depth 65 meters. Clump weight recovered at 20:21hrs (54° 55.168N – 00° 44.947W), depth 65 meters.

Moved back into position and deployed the serviced Waverider at 20:43hrs (54° 55.124N – 00° 44.908W), depth 66 meters. Clump weight released at 20:44hrs (54° 55.123N – 00° 44.909W), depth 66 meters.

We then transited to the Off Tees water station and deployed the ESMX at 22:04 (54° 43.943N - 0° 52.914W), depth 55 meters. We then deployed the CTD at 22:33hrs (54° 43.943N – 0° 52.917W), depth 55. Collecting Salinity, Chlorophyll, Nutrients. Tyne/Tees survey area complete.

Friday 7th February

Overnight we transited to the HumOpen-NE CTD water station. During the transit we collected underway water samples. 00:34hrs (54° 45.479N – 0° 21.517W), depth 67 meters. 02:34hrs (54° 46.945N - 0° 17.224E), depth 73 meters. 04:33hrs (54° 49.150N - 0° 56.132E), depth 64 meters.

All collecting Salinity, Chlorophyll, Nutrients

Arrived at the HumOpen-NE water station and deployed the CTD and the ESMX, 05:52hrs (54° 49.858N – 01° 20.188E), depth 29 meters, collecting Salinity, Chlorophyll, Nutrients.

We then moved off and headed towards the HumOpen-S water station. During the transits we collected Underway water samples. 09:19hrs (54° 24.627N – 01° 41.587E), depth 46 meters. Collecting Salinity, Chlorophyll, Nutrients.

Arrived at the HumOpen-S CTD water sample and deployed the ESMX profiler, 11:50hrs (54° 0.178N - 01° 59.664E), depth 78 meters. Collecting Salinity, Chlorophyll, Nutrients and O₂. We then deployed the CTD, 12:20hrs (54° 0.162N – 01° 59.896E), depth 78.

We carried on heading south towards the EssexOpen water station and along the way collected Underway water samples. 14:00hrs (53° 52.291N - 02° 14.681E), depth 35 meters. 16:01hrs (53° 32.362N - 02° 30.840E), depth 33 meters. 18:00hrs (53° 11.420N - 02° 44.358E), depth 33 meters. Collecting Salinity, Chlorophyll, Nutrients, Suspended Particulate Matter.

Arrived at the EssexOpen CTD water station and deployed the CTD, 20:02hrs (52° 50.035N – 02° 49.939E), depth 36 meters, collecting Salinity, Chlorophyll, Nutrients, Suspended Particulate Matter, O₂ and CDOM. We then deployed the ESMX Profiler, 20:40hrs (52° 49.994N - 02° 49.807E), depth 35 meters.

We then carried on heading south towards Lowestoft collecting Underway water samples, 22:32hrs (52° 36.919N - 02° 49.802E), depth 46 meters.

Saturday 8th February

00:31hrs (52° 22.518N - 02° 49.576E), depth 47 meters, 02:32hrs (52° 23.221N - 02° 23.105E), depth 50 meters. All collecting Salinity, Chlorophyll, Nutrients, Suspended Particulate Matter and CDOM.

We then made are way back into Lowestoft, where we picked up the pilot at 07:06hrs and made our way through the bridge. We were alongside and all fast at 07:48hrs.

Very successful survey, with all objectives completed, plus extras. Thanks to all the crew and Cefas staff for all their efforts.

Marc Whybrow
Scientist in Charge
8th February 2020

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