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Short Cruise Report

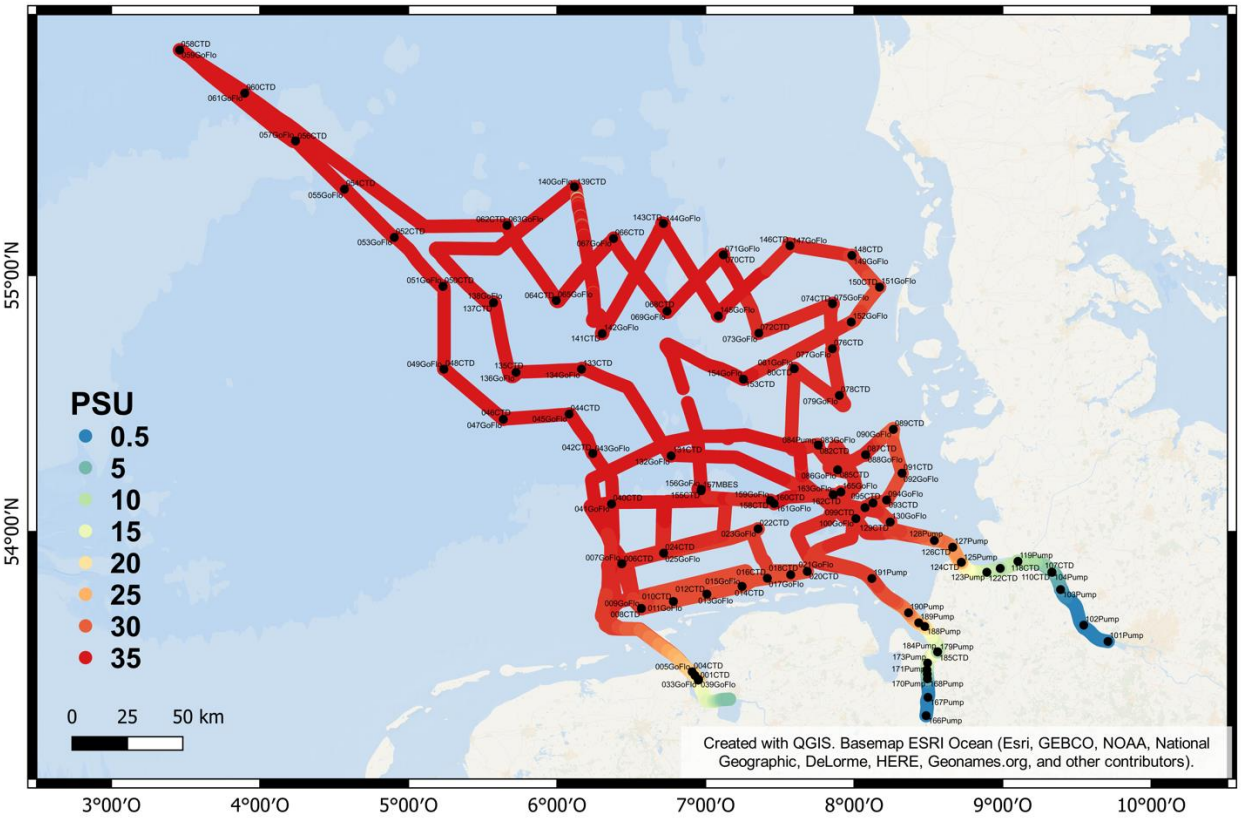
R/V METEOR, cruise M169 (GPF 20-3_091)

Emden (Germany) – Emden (Germany)

11.12.2020 – 29.12.2020

Chief Scientist: Andrea Koschinsky

Captain: Rainer Hammacher



Objectives

The aim of the cruise and related project was to study anthropogenic inputs of emerging, critical metal contaminants such as rare earths, scandium (Sc), gallium (Ga), germanium (Ge), platinum (Pt), zirconium (Zr), titanium (Ti), molybdenum (mo), and vanadium (V) from the river Ems, Weser and Elbe into the southern North Sea. These metals are largely introduced into the environment from modern technologies such as renewable energies, nanoparticles from cosmetics products as well as medical applications. Via the rivers these substances reach the coastal areas and finally the sea, with significant modifications of the elemental fluxes by physical and chemical processes taking place during mixing of freshwater and seawater in the estuaries. In addition, the resistance of the microbial community to various elements of our list of critical metals and various concentrations will be assessed for the German Bight, focusing on diatom-bacteria interactions at the molecular level with special emphasis on the role of bacterial heavy metal resistance during marine snow formation.

Specifically, our objectives are:

- Characterization of trace metal distribution between different physical size pools (truly dissolved, organic and inorganic colloids, particles) over the salinity gradient in order to quantify their contribution to the overall riverine input.
- Determine lability of (anthropogenic) trace metal complexes and NPCs using a passive sampling (DGT) method
- Tracing anthropogenic inputs into the North Sea, using anthropogenic La and Gd,
- Using Ga/Al and Ge/Si ratios to trace anthropogenic Ga and Ge
- Assessment of the potential risks of emerging critical metal input into the North Sea and potential sources in the river effluent

Our hypotheses to be tested by our objectives are:

- Anthropogenic metal input will be different among the various river systems, as industrial and agricultural sources will be variable.
- Anthropogenically introduced metals can behave differently during biogeochemical cycling in estuarine systems and seawater than the same elements of geogenic origin, as they may have a different chemical speciation (e.g. as organic complex).
- Anthropogenic La and Gd are suitable far-field tracers for stable (organic and metal-organic) pollutants
- “Salting out” areas for flocculating metals will shift spatially in the estuary between high tide and low tide.
- More heavy metal resistant microbes are present in estuaries and directly affected regions in comparison to relatively pristine areas of the German Bight.

Narrative

Research cruise M169 covered the river estuaries of Ems, Weser and Elbe and the North Sea. Samples were taken throughout the complete German EEZ of the North Sea, including coastal regions of Lower Saxony and Schleswig-Holstein, the western and northern borders of the EEZ and the Dogger Bank in the northwest. Rivers were also sampled until the river endmember was reached, which was at Wedel on the Elbe and at Elsfleth on the Weser. The Ems could only be sampled north of the lock of the port of Emden.

The cruise began at noon on December 11, 2020, leaving the port of Emden under good weather conditions. The first water samples taken from the Ems close to the lock had already significantly more than 50% of seawater in it and the river endmember could not be sampled. Several more stations on our way towards the North Sea followed until we had completed the Ems and estuary profile, part of the northern extension towards the Dogger Bank, as well as the river plume being pushed towards the East along the coast were finished within the first three days. Partly the coordinates of our sampling tracks and points were influenced by the restricted access in areas with seafloor cables, offshore windparks, shipping lanes and other regulations in the North Sea. On December 14 we returned to the Ems to sample a 12-hour tidal cycle at a fixed location several times at high water, low water and in between. We chose a location where R/V METEOR could be anchored for 12 hours without interfering with other vessels, where we covered a salinity range of about 22-25 PSU and took seven samples during this time. Subsequently, on December 15, we began the profile along the western boundary of the German EEZ into the northwesternmost tip of the Dogger Bank. Continuous recording of salinity by the ship's thermosalinograph indicated a measurable influence of the Rhine water flowing in from the west along the stretch between about 54°N and 55°N. The profile was continued on December 17 along the northern EEZ boundary toward Sylt, where we already clearly entered the Elbe influence area. In a zigzag line, we continued the profiles and sampling on the 18th and early 19th of December to the southeast in order to achieve the best possible resolution of the influence of the Elbe as well as the Schleswig-Holstein coastal zone. However, the restrictions on ship traffic and the shallow water depth did not allow sampling very close to shore.

In the morning on December 19, we entered the river Elbe. At Wedel, shortly before Hamburg, we sampled the influence of Hamburg on the Elbe water. Further stations followed on the way downstream to the roadstead at Freiburg (Elbe), where we investigated a 12-hour tidal cycle equivalent to the Ems, but with higher river water content at salinities between 3 and 7 PSU. On December 20 we continued sampling the salinity tidal gradient towards Cuxhaven and Neuwerk and finished this in the evening. After leaving the Elbe, we continued salinity transects and sampling in the northeastern and central part of the German EEZ and further towards Helgoland from December 21. Gaps from previous salinity mapping were filled and CTD and Go-Flo bottle stations continued. Shortly before Christmas we reached Helgoland and sampled a relatively deep site of 56 m in several water depths as well as a site to the southeast, possibly influenced by the island's input. December 23 was dedicated to a 24-hours mapping program with EM710 at Figge Maar west of Helgoland to detect gas flares from this depression where methane was known to escape to the water column. Salinity transects in this area were continued on December 24.

On December 25 and 26, the Weser was the last of the three rivers to be navigated and sampled for the salinity gradient from the river to the North Sea. At Elsfleth we took the river end-member samples at low water in the afternoon of the 25th. In the evening the salinity increased measurably again from Brake with rising water and further samples were taken up to the roadstead near Bremerhaven, where we then remained on site for the 12-hour tidal cycle. This recorded a relatively wide range from about 6.5 PSU at low water to 17.5 PSU at high water. While we were lucky with the weather at this time of year for most the cruise, we had to weather off at the end of the trip on December

26/27 after sampling the Weser near Bremerhaven, as a hurricane depression gripped the entire North Sea region up to the coasts with wind forces of 9 to gusts of 11. However the interrupted remaining work could successfully completed afterwards on December 28. Remaining gaps in the salinity transects of our working area were covered during the cruise back to the port of Emden where our cruise ended in the morning on December 29, 2020.

Altogether, we cruised 1900 nautical miles with salinity recording and carried out 191 water sampling stations. We took several hundreds of water and particle samples collected by CTD-rosette water sampler, Niskin bottles and a pump system from the rivers, estuaries and the southern North Sea to conduct geochemical and microbiological analyses and experiments that will deliver a good data base for the assessment of the potential impact that these emerging metal compounds may have. These samples were filtered in the ship's laboratory (0.2 and 0.015 µm pore size), pH was measured and some samples were ultra-filtered (10 kDa and 1 kDa). All samples were stored for further trace metal analysis in the home laboratories. Microbial cultures were prepared and microscopic investigations carried out for a first characterization of microbial communities associated with particulate matter in the water samples. In parallel to direct sampling, from certain positions passive samplers, so-called DGTs, were deployed in carboys of larger water samples to collect trace metals for analysis. During all cruise tracks between CTD- and GoFlo-stations salinity data were recorded with the thermosalinograph of the vessel, nitrate data collected with a sensor mounted to the CTD frame, and shipbound ADCP data (75 kHz) were recorded.

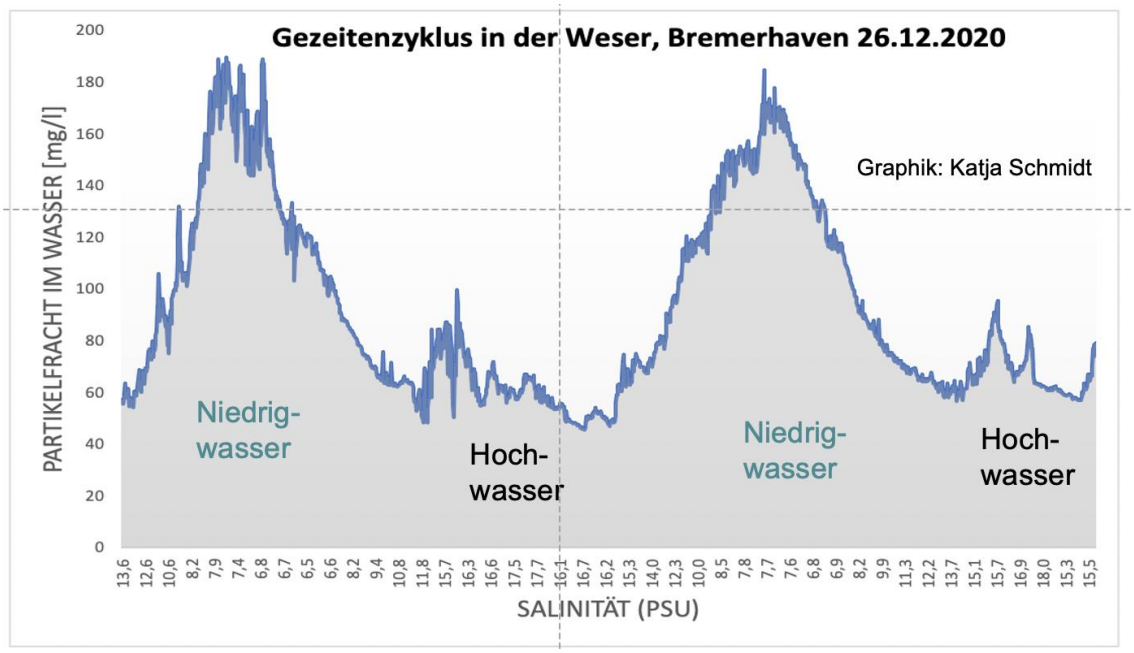


Fig. 1: Variation of particle load at a point near Bremerhaven during different high and low tide phases.

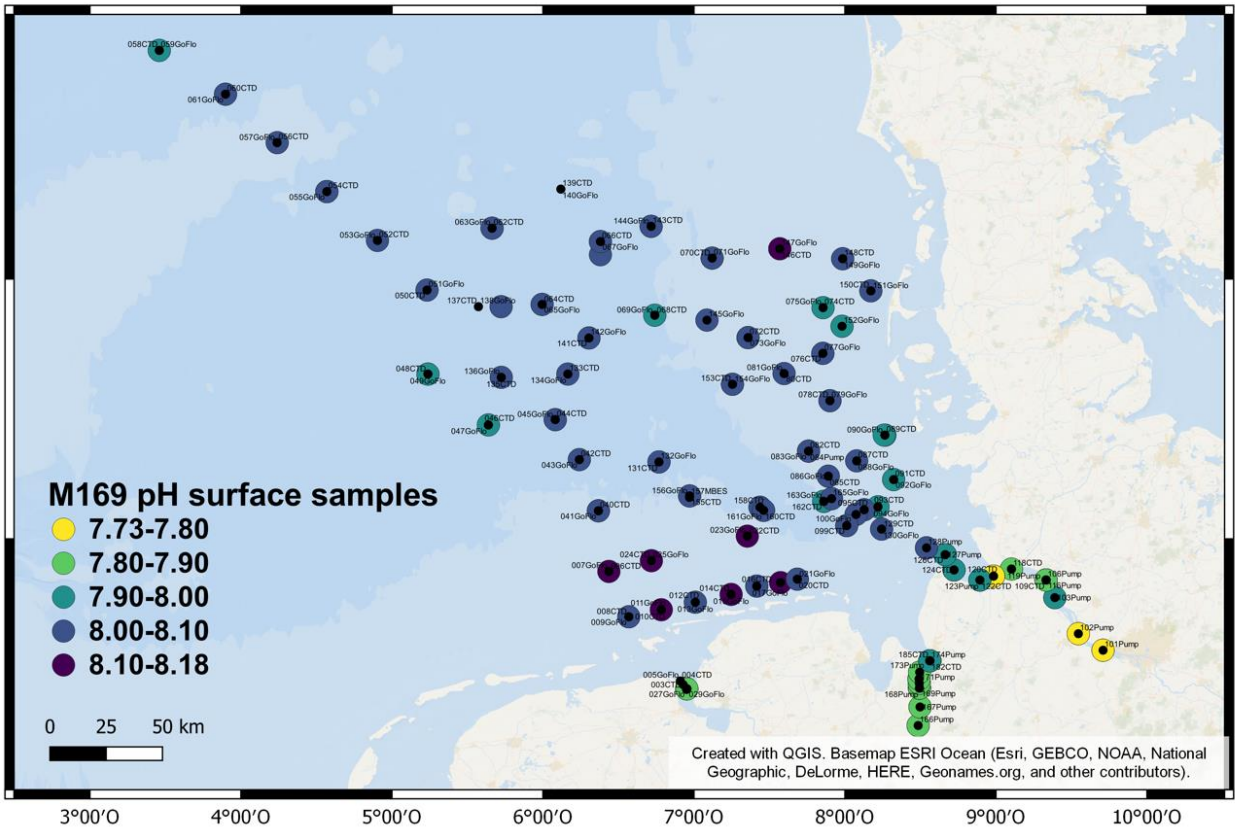


Fig. 2: pH measurements in M169 surface water samples indicating different water masses of the rivers and mixing with North Sea water (GIS map by Sophie Paul)

Acknowledgements

Cruise M169 was very successful, thanks in considerable part to the friendly atmosphere and the very cooperative and pleasant working relationship between scientists and the ship's crew. We would like to express our sincere thanks to Captain Rainer Hammacher and his entire team, as well as to the German Research Fleet Coordination Centre, the shipping company Briese and the Expert Panel on Research Vessels (GPF) for making this expedition under pandemic conditions possible and thus opening up an exciting new research project for us.

List of participants

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Station list

Station	Date / Time UTC	Device	Action	Latitude N	Longitude E	Depth (m)
M169_1-1 CTD	11.12.2020 13:30	CTD	in the water	53° 24,576'	006° 57,033'	6
M169_1-2 CTD	11.12.2020 14:29	CTD	max depth	53° 24,574'	006° 57,035'	13
M169_3-1 CTD	11.12.2020 15:48	CTD	max depth	53° 25,689'	006° 55,715'	11
M169_4-1 CTD	11.12.2020 16:44	CTD	max depth	53° 26,561'	006° 54,583'	17
M169_5-1 GOFLO	11.12.2020 17:23	GO-FLO	max depth	53° 26,561'	006° 54,584'	17
M169_5-1 GOFLO	11.12.2020 17:32	GO-FLO	max depth	53° 26,563'	006° 54,589'	17
M169_5-1 GOFLO	11.12.2020 17:49	GO-FLO	max depth	53° 26,561'	006° 54,587'	18
M169_5-1 GOFLO	11.12.2020 17:54	GO-FLO	max depth	53° 26,561'	006° 54,587'	18
M169_5-1 GOFLO	11.12.2020 18:02	GO-FLO	max depth	53° 26,562'	006° 54,586'	18
M169_5-1 GOFLO	11.12.2020 18:12	GO-FLO	max depth	53° 26,561'	006° 54,587'	18
M169_5-1 GOFLO	11.12.2020 18:18	GO-FLO	max depth	53° 26,562'	006° 54,588'	18
M169_5-1 GOFLO	11.12.2020 18:28	GO-FLO	max depth	53° 26,562'	006° 54,586'	18
M169_5-1 GOFLO	11.12.2020 18:40	GO-FLO	max depth	53° 26,560'	006° 54,585'	18
M169_5-1 GOFLO	11.12.2020 19:20	GO-FLO	max depth	53° 26,561'	006° 54,585'	18
M169_6-1 CTD	12.12.2020 14:01	CTD	max depth	53° 52,386'	006° 26,188'	26
M169_7-1 GOFLO	12.12.2020 14:21	GO-FLO	max depth	53° 52,385'	006° 26,187'	26
M169_7-1 GOFLO	12.12.2020 14:28	GO-FLO	information	53° 52,386'	006° 26,188'	26
M169_7-1 GOFLO	12.12.2020 14:29	GO-FLO	max depth	53° 52,386'	006° 26,188'	26
M169_7-1 GOFLO	12.12.2020 14:30	GO-FLO	information	53° 52,386'	006° 26,188'	26
M169_7-1 GOFLO	12.12.2020 14:34	GO-FLO	max depth	53° 52,386'	006° 26,188'	26
M169_7-1 GOFLO	12.12.2020 14:36	GO-FLO	information	53° 52,385'	006° 26,187'	26
M169_7-1 GOFLO	12.12.2020 14:39	GO-FLO	max depth	53° 52,386'	006° 26,188'	26
M169_8-1 CTD	12.12.2020 17:06	CTD	max depth	53° 41,729'	006° 34,118'	15
M169_9-1 GOFLO	12.12.2020 17:23	GO-FLO	max depth	53° 41,729'	006° 34,117'	21
M169_9-1 GOFLO	12.12.2020 17:28	GO-FLO	max depth	53° 41,729'	006° 34,118'	21
M169_9-1 GOFLO	12.12.2020 17:36	GO-FLO	max depth	53° 41,729'	006° 34,117'	21
M169_10-1 CTD	12.12.2020 19:03	CTD	max depth	53° 43,386'	006° 47,022'	18
M169_11-1 GOFLO	12.12.2020 19:19	GO-FLO	max depth	53° 43,387'	006° 47,022'	18
M169_11-1 GOFLO	12.12.2020 19:27	GO-FLO	max depth	53° 43,386'	006° 47,021'	18
M169_12-1 CTD	12.12.2020 22:46	CTD	max depth	53° 45,154'	007° 00,537'	17
M169_13-1 GOFLO	12.12.2020 23:26	GO-FLO	max depth	53° 45,154'	007° 00,538'	17
M169_13-1 GOFLO	12.12.2020 23:37	GO-FLO	max depth	53° 45,154'	007° 00,537'	17
M169_14-1 CTD	13.12.2020 01:50	CTD	max depth	53° 46,996'	007° 14,759'	18
M169_15-1 GOFLO	13.12.2020 02:10	GO-FLO	max depth	53° 46,996'	007° 14,760'	18
M169_15-1 GOFLO	13.12.2020 02:24	GO-FLO	max depth	53° 46,996'	007° 14,761'	18
M169_16-1 CTD	13.12.2020 04:51	CTD	max depth	53° 48,943'	007° 24,949'	24
M169_17-1 GOFLO	13.12.2020 05:11	GO-FLO	max depth	53° 48,943'	007° 24,948'	24
M169_17-1 GOFLO	13.12.2020 05:18	GO-FLO	max depth	53° 48,943'	007° 24,948'	24
M169_18-1 CTD	13.12.2020 09:49	CTD	max depth	53° 49,761'	007° 34,401'	16
M169_19-1 GOFLO	13.12.2020 10:01	GO-FLO	max depth	53° 49,762'	007° 34,401'	16
M169_19-1 GOFLO	13.12.2020 10:08	GO-FLO	max depth	53° 49,761'	007° 34,401'	16
M169_20-1 CTD	13.12.2020 11:10	CTD	max depth	53° 50,527'	007° 41,055'	14
M169_20-1 CTD	13.12.2020 11:27	CTD	max depth	53° 50,570'	007° 41,075'	13
M169_21-1 GOFLO	13.12.2020 11:42	GO-FLO	max depth	53° 50,570'	007° 41,077'	13
M169_21-1 GOFLO	13.12.2020 11:50	GO-FLO	max depth	53° 50,569'	007° 41,077'	13
M169_22-1 CTD	13.12.2020 14:00	CTD	max depth	54° 00,647'	007° 21,203'	25
M169_23-1 GOFLO	13.12.2020 14:20	GO-FLO	max depth	54° 00,647'	007° 21,202'	25
M169_23-1 GOFLO	13.12.2020 14:27	GO-FLO	max depth	54° 00,647'	007° 21,202'	25
M169_24-1 CTD	13.12.2020 16:58	CTD	max depth	53° 54,903'	006° 43,082'	25
M169_25-1 GOFLO	13.12.2020 17:14	GO-FLO	max depth	53° 54,904'	006° 43,080'	25
M169_25-1 GOFLO	13.12.2020 17:21	GO-FLO	max depth	53° 54,904'	006° 43,080'	25
M169_26-1 CTD	14.12.2020 06:00	CTD	max depth	53° 24,722'	006° 57,166'	0
M169_27-1 GOFLO	14.12.2020 06:16	GO-FLO	max depth	53° 24,723'	006° 57,165'	8
M169_27-1 GOFLO	14.12.2020 06:23	GO-FLO	max depth	53° 24,723'	006° 57,164'	8
M169_27-1 GOFLO	14.12.2020 06:29	GO-FLO	max depth	53° 24,723'	006° 57,165'	8
M169_27-1 GOFLO	14.12.2020 06:35	GO-FLO	max depth	53° 24,723'	006° 57,164'	0

M169_27-1 GOFLO	14.12.2020 06:41	GO-FLO	max depth	53° 24,723'	006° 57,164'	8
M169_28-1 CTD	14.12.2020 08:05	CTD	max depth	53° 24,723'	006° 57,165'	9
M169_29-1 GOFLO	14.12.2020 08:17	GO-FLO	max depth	53° 24,723'	006° 57,164'	9
M169_29-1 GOFLO	14.12.2020 08:26	GO-FLO	max depth	53° 24,723'	006° 57,166'	9
M169_29-1 GOFLO	14.12.2020 08:31	GO-FLO	max depth	53° 24,722'	006° 57,164'	9
M169_30-1 CTD	14.12.2020 10:13	CTD	max depth	53° 24,712'	006° 57,159'	9
M169_31-1 GOFLO	14.12.2020 10:26	GO-FLO	max depth	53° 24,713'	006° 57,159'	0
M169_31-1 GOFLO	14.12.2020 10:31	GO-FLO	max depth	53° 24,713'	006° 57,160'	9
M169_32-1 CTD	14.12.2020 12:32	CTD	max depth	53° 24,711'	006° 57,162'	8
M169_33-1 GOFLO	14.12.2020 12:44	GO-FLO	max depth	53° 24,708'	006° 57,167'	8
M169_33-1 GOFLO	14.12.2020 12:53	GO-FLO	max depth	53° 24,709'	006° 57,165'	8
M169_34-1 CTD	14.12.2020 14:35	CTD	max depth	53° 24,710'	006° 57,166'	7
M169_35-1 GOFLO	14.12.2020 14:48	GO-FLO	max depth	53° 24,709'	006° 57,166'	7
M169_35-1 GOFLO	14.12.2020 14:55	GO-FLO	max depth	53° 24,710'	006° 57,165'	7
M169_35-1 GOFLO	14.12.2020 15:04	GO-FLO	max depth	53° 24,710'	006° 57,166'	7
M169_36-1 CTD	14.12.2020 16:35	CTD	max depth	53° 24,710'	006° 57,165'	7
M169_37-1 GOFLO	14.12.2020 16:48	GO-FLO	max depth	53° 24,710'	006° 57,166'	0
M169_37-1 GOFLO	14.12.2020 16:55	GO-FLO	max depth	53° 24,710'	006° 57,168'	7
M169_37-1 GOFLO	14.12.2020 17:00	GO-FLO	max depth	53° 24,710'	006° 57,170'	7
M169_37-1 GOFLO	14.12.2020 17:12	GO-FLO	max depth	53° 24,710'	006° 57,168'	7
M169_38-1 CTD	14.12.2020 18:46	CTD	max depth	53° 24,689'	006° 57,201'	8
M169_39-1 GOFLO	14.12.2020 18:58	GO-FLO	max depth	53° 24,690'	006° 57,201'	8
M169_39-1 GOFLO	14.12.2020 19:03	GO-FLO	max depth	53° 24,689'	006° 57,202'	8
M169_40-1 CTD	15.12.2020 00:27	CTD	max depth	54° 06,567'	006° 22,039'	29
M169_41-1 GOFLO	15.12.2020 00:55	GO-FLO	max depth	54° 06,556'	006° 22,005'	29
M169_41-1 GOFLO	15.12.2020 01:07	GO-FLO	max depth	54° 06,555'	006° 22,004'	29
M169_41-2 GOFLO	15.12.2020 01:17	GO-FLO	max depth	54° 06,555'	006° 22,003'	29
M169_41-3 GOFLO	15.12.2020 01:33	GO-FLO	max depth	54° 06,555'	006° 22,005'	28
M169_41-4 GOFLO	15.12.2020 02:08	GO-FLO	max depth	54° 06,555'	006° 22,004'	29
M169_41-5 GOFLO	15.12.2020 02:25	GO-FLO	max depth	54° 06,554'	006° 22,004'	29
M169_42-1 CTD	15.12.2020 03:56	CTD	max depth	54° 18,461'	006° 14,446'	32
M169_43-1 GOFLO	15.12.2020 04:18	GO-FLO	max depth	54° 18,461'	006° 14,448'	34
M169_43-1 GOFLO	15.12.2020 04:30	GO-FLO	max depth	54° 18,461'	006° 14,445'	34
M169_43-1 GOFLO	15.12.2020 04:51	GO-FLO	max depth	54° 18,461'	006° 14,444'	34
M169_43-1 GOFLO	15.12.2020 05:02	GO-FLO	max depth	54° 18,461'	006° 14,445'	34
M169_43-1 GOFLO	15.12.2020 05:07	GO-FLO	max depth	54° 18,461'	006° 14,446'	33
M169_44-1 CTD	15.12.2020 06:25	CTD	max depth	54° 27,728'	006° 04,873'	36
M169_44-2 CTD	15.12.2020 06:59	CTD	max depth	54° 27,728'	006° 04,873'	37
M169_45-1 GOFLO	15.12.2020 07:13	GO-FLO	max depth	54° 27,730'	006° 04,872'	37
M169_45-1 GOFLO	15.12.2020 07:27	GO-FLO	max depth	54° 27,720'	006° 04,882'	36
M169_45-1 GOFLO	15.12.2020 07:54	GO-FLO	max depth	54° 27,704'	006° 04,900'	37
M169_45-1 GOFLO	15.12.2020 08:00	GO-FLO	max depth	54° 27,688'	006° 04,917'	37
M169_46-1 CTD	15.12.2020 10:19	CTD	max depth	54° 26,491'	005° 38,320'	38
M169_47-1 GOFLO	15.12.2020 11:07	GO-FLO	max depth	54° 26,491'	005° 38,319'	38
M169_47-1 GOFLO	15.12.2020 11:21	GO-FLO	max depth	54° 26,491'	005° 38,319'	38
M169_47-2 GOFLO	15.12.2020 11:50	GO-FLO	max depth	54° 26,491'	005° 38,320'	38
M169_47-2 GOFLO	15.12.2020 12:00	GO-FLO	max depth	54° 26,491'	005° 38,319'	38
M169_48-1 CTD	15.12.2020 14:11	CTD	information	54° 38,227'	005° 14,294'	40
M169_49-1 GOFLO	15.12.2020 14:22	GO-FLO	max depth	54° 38,227'	005° 14,292'	40
M169_49-1 GOFLO	15.12.2020 14:35	GO-FLO	max depth	54° 38,227'	005° 14,293'	40
M169_49-1 GOFLO	15.12.2020 14:47	GO-FLO	max depth	54° 38,227'	005° 14,291'	40
M169_49-1 GOFLO	15.12.2020 14:59	GO-FLO	max depth	54° 38,227'	005° 14,293'	40
M169_49-1 GOFLO	15.12.2020 15:10	GO-FLO	max depth	54° 38,226'	005° 14,292'	39
M169_49-1 GOFLO	15.12.2020 15:26	GO-FLO	max depth	54° 38,227'	005° 14,291'	41
M169_49-1 GOFLO	15.12.2020 15:37	GO-FLO	max depth	54° 38,227'	005° 14,292'	40
M169_49-1 GOFLO	15.12.2020 15:43	GO-FLO	max depth	54° 38,227'	005° 14,291'	40
M169_49-1 GOFLO	15.12.2020 15:49	GO-FLO	max depth	54° 38,227'	005° 14,292'	40
M169_49-1 GOFLO	15.12.2020 15:55	GO-FLO	max depth	54° 38,227'	005° 14,293'	41
M169_50-1 CTD	15.12.2020 18:00	CTD	max depth	54° 57,483'	005° 13,935'	36
M169_51-1 GOFLO	15.12.2020 18:18	GO-FLO	max depth	54° 57,482'	005° 13,936'	36

M169_51-1 GOFLO	15.12.2020 18:29	GO-FLO	max depth	54° 57,483'	005° 13,935'	36
M169_51-1 GOFLO	15.12.2020 19:00	GO-FLO	max depth	54° 57,483'	005° 13,935'	36
M169_51-1 GOFLO	15.12.2020 19:05	GO-FLO	max depth	54° 57,483'	005° 13,935'	36
M169_52-1 CTD	15.12.2020 21:00	CTD	max depth	55° 08,788'	004° 54,249'	36
M169_53-1 GOFLO	15.12.2020 21:34	GO-FLO	max depth	55° 08,791'	004° 54,240'	35
M169_53-1 GOFLO	15.12.2020 21:42	GO-FLO	max depth	55° 08,791'	004° 54,240'	36
M169_53-1 GOFLO	15.12.2020 21:52	GO-FLO	max depth	55° 08,792'	004° 54,239'	36
M169_53-1 GOFLO	15.12.2020 22:22	GO-FLO	max depth	55° 08,791'	004° 54,240'	36
M169_53-1 GOFLO	15.12.2020 22:34	GO-FLO	max depth	55° 08,791'	004° 54,240'	35
M169_54-1 CTD	16.12.2020 00:27	CTD	max depth	55° 19,867'	004° 34,126'	42
M169_55-1 GOFLO	16.12.2020 00:54	GO-FLO	max depth	55° 19,867'	004° 34,125'	41
M169_55-1 GOFLO	16.12.2020 01:03	GO-FLO	max depth	55° 19,867'	004° 34,126'	42
M169_55-1 GOFLO	16.12.2020 01:17	GO-FLO	max depth	55° 19,866'	004° 34,126'	41
M169_55-1 GOFLO	16.12.2020 01:24	GO-FLO	max depth	55° 19,866'	004° 34,127'	42
M169_55-1 GOFLO	16.12.2020 01:31	GO-FLO	max depth	55° 19,866'	004° 34,126'	41
M169_55-1 GOFLO	16.12.2020 01:41	GO-FLO	max depth	55° 19,866'	004° 34,126'	42
M169_55-1 GOFLO	16.12.2020 01:53	GO-FLO	max depth	55° 19,866'	004° 34,126'	41
M169_55-1 GOFLO	16.12.2020 02:00	GO-FLO	max depth	55° 19,867'	004° 34,126'	41
M169_55-1 GOFLO	16.12.2020 02:07	GO-FLO	max depth	55° 19,866'	004° 34,126'	42
M169_55-1 GOFLO	16.12.2020 02:15	GO-FLO	max depth	55° 19,866'	004° 34,125'	41
M169_55-1 GOFLO	16.12.2020 02:25	GO-FLO	max depth	55° 19,866'	004° 34,126'	41
M169_55-1 GOFLO	16.12.2020 02:33	GO-FLO	max depth	55° 19,866'	004° 34,126'	42
M169_55-1 GOFLO	16.12.2020 02:40	GO-FLO	max depth	55° 19,866'	004° 34,126'	41
M169_55-1 GOFLO	16.12.2020 02:47	GO-FLO	max depth	55° 19,866'	004° 34,126'	41
M169_55-1 GOFLO	16.12.2020 02:55	GO-FLO	max depth	55° 19,866'	004° 34,127'	41
M169_55-1 GOFLO	16.12.2020 03:02	GO-FLO	max depth	55° 19,866'	004° 34,126'	41
M169_55-1 GOFLO	16.12.2020 03:11	GO-FLO	max depth	55° 19,867'	004° 34,127'	42
M169_55-1 GOFLO	16.12.2020 04:35	GO-FLO	max depth	55° 19,866'	004° 34,127'	42
M169_55-1 GOFLO	16.12.2020 04:41	GO-FLO	max depth	55° 19,867'	004° 34,126'	42
M169_55-1 GOFLO	16.12.2020 04:44	GO-FLO	max depth	55° 19,866'	004° 34,126'	42
M169_55-1 GOFLO	16.12.2020 05:19	GO-FLO	max depth	55° 19,866'	004° 34,126'	41
M169_55-1 GOFLO	16.12.2020 06:09	GO-FLO	max depth	55° 19,867'	004° 34,126'	43
M169_55-1 GOFLO	16.12.2020 06:29	GO-FLO	max depth	55° 19,867'	004° 34,126'	42
M169_56-1 CTD	16.12.2020 08:18	CTD	information	55° 30,914'	004° 14,337'	27
M169_56-1 CTD	16.12.2020 08:23	CTD	max depth	55° 30,914'	004° 14,335'	27
M169_57-1 GOFLO	16.12.2020 08:44	GO-FLO	max depth	55° 30,910'	004° 14,357'	27
M169_57-1 GOFLO	16.12.2020 08:51	GO-FLO	max depth	55° 30,906'	004° 14,379'	27
M169_57-1 GOFLO	16.12.2020 08:58	GO-FLO	max depth	55° 30,908'	004° 14,373'	27
M169_57-1 GOFLO	16.12.2020 09:44	GO-FLO	max depth	55° 30,903'	004° 14,401'	0
M169_57-1 GOFLO	16.12.2020 09:51	GO-FLO	max depth	55° 30,904'	004° 14,400'	28
M169_58-1 CTD	16.12.2020 13:19	CTD	max depth	55° 51,586'	003° 27,548'	57
M169_58-1 CTD	16.12.2020 13:41	CTD	max depth	55° 51,586'	003° 27,550'	56
M169_59-1 GOFLO	16.12.2020 13:59	GO-FLO	max depth	55° 51,587'	003° 27,549'	0
M169_59-1 GOFLO	16.12.2020 14:15	GO-FLO	max depth	55° 51,586'	003° 27,550'	58
M169_59-1 GOFLO	16.12.2020 14:57	GO-FLO	max depth	55° 51,587'	003° 27,551'	55
M169_59-1 GOFLO	16.12.2020 15:06	GO-FLO	max depth	55° 51,591'	003° 27,550'	56
M169_59-1 GOFLO	16.12.2020 15:37	GO-FLO	max depth	55° 51,585'	003° 27,548'	56
M169_59-1 GOFLO	16.12.2020 15:44	GO-FLO	max depth	55° 51,588'	003° 27,549'	57
M169_60-1 CTD	16.12.2020 18:11	CTD	max depth	55° 41,794'	003° 53,855'	37
M169_61-1 GOFLO	16.12.2020 18:31	GO-FLO	max depth	55° 41,793'	003° 53,858'	37
M169_61-1 GOFLO	16.12.2020 18:43	GO-FLO	max depth	55° 41,793'	003° 53,857'	36
M169_61-1 GOFLO	16.12.2020 19:31	GO-FLO	max depth	55° 41,792'	003° 53,857'	36
M169_61-1 GOFLO	16.12.2020 19:47	GO-FLO	max depth	55° 41,794'	003° 53,856'	37
M169_62-1 CTD	17.12.2020 03:25	CTD	max depth	55° 11,574'	005° 39,790'	6
M169_63-1 GOFLO	17.12.2020 03:49	GO-FLO	max depth	55° 11,572'	005° 39,784'	40
M169_63-1 GOFLO	17.12.2020 04:03	GO-FLO	max depth	55° 11,572'	005° 39,785'	40
M169_63-1 GOFLO	17.12.2020 04:48	GO-FLO	max depth	55° 11,572'	005° 39,785'	40
M169_63-1 GOFLO	17.12.2020 04:53	GO-FLO	information	55° 11,573'	005° 39,787'	40
M169_63-1 GOFLO	17.12.2020 04:57	GO-FLO	max depth	55° 11,574'	005° 39,781'	38
M169_64-1 CTD	17.12.2020 07:14	CTD	max depth	54° 54,207'	005° 59,662'	35

M169_64-1 CTD	17.12.2020 07:34	CTD	max depth	54° 54,205'	005° 59,666'	35
M169_65-1 GOFLO	17.12.2020 07:56	GO-FLO	max depth	54° 54,204'	005° 59,666'	36
M169_65-1 GOFLO	17.12.2020 08:06	GO-FLO	max depth	54° 54,204'	005° 59,667'	36
M169_65-1 GOFLO	17.12.2020 08:37	GO-FLO	max depth	54° 54,206'	005° 59,664'	35
M169_65-1 GOFLO	17.12.2020 08:48	GO-FLO	max depth	54° 54,206'	005° 59,666'	36
M169_66-1 CTD	17.12.2020 11:03	CTD	max depth	55° 08,537'	006° 22,835'	43
M169_67-1 GOFLO	17.12.2020 11:22	GO-FLO	max depth	55° 08,535'	006° 22,835'	42
M169_67-1 GOFLO	17.12.2020 11:34	GO-FLO	max depth	55° 08,536'	006° 22,836'	43
M169_67-1 GOFLO	17.12.2020 12:01	GO-FLO	max depth	55° 08,534'	006° 22,836'	43
M169_67-1 GOFLO	17.12.2020 12:08	GO-FLO	max depth	55° 08,534'	006° 22,836'	43
M169_68-1 CTD	17.12.2020 15:09	CTD	max depth	54° 51,733'	006° 44,423'	36
M169_69-1 GOFLO	17.12.2020 15:31	GO-FLO	max depth	54° 51,734'	006° 44,423'	36
M169_69-1 GOFLO	17.12.2020 15:40	GO-FLO	max depth	54° 51,734'	006° 44,422'	36
M169_69-1 GOFLO	17.12.2020 16:06	GO-FLO	max depth	54° 51,735'	006° 44,420'	36
M169_69-1 GOFLO	17.12.2020 16:13	GO-FLO	max depth	54° 51,734'	006° 44,422'	36
M169_70-1 CTD	17.12.2020 18:09	CTD	max depth	55° 04,773'	007° 07,232'	29
M169_71-1 GOFLO	17.12.2020 18:27	GO-FLO	max depth	55° 04,773'	007° 07,226'	29
M169_71-1 GOFLO	17.12.2020 18:35	GO-FLO	max depth	55° 04,773'	007° 07,226'	29
M169_71-1 GOFLO	17.12.2020 19:05	GO-FLO	max depth	55° 04,773'	007° 07,225'	29
M169_71-1 GOFLO	17.12.2020 19:14	GO-FLO	max depth	55° 04,773'	007° 07,225'	29
M169_72-1 CTD	17.12.2020 21:31	CTD	max depth	54° 46,610'	007° 21,502'	20
M169_73-1 GOFLO	17.12.2020 21:50	GO-FLO	max depth	54° 46,611'	007° 21,504'	2
M169_73-1 GOFLO	17.12.2020 21:57	GO-FLO	max depth	54° 46,611'	007° 21,502'	22
M169_74-1 CTD	18.12.2020 00:25	CTD	max depth	54° 53,469'	007° 51,289'	16
M169_75-1 GOFLO	18.12.2020 00:49	GO-FLO	max depth	54° 53,467'	007° 51,290'	16
M169_75-1 GOFLO	18.12.2020 00:56	GO-FLO	max depth	54° 53,468'	007° 51,289'	16
M169_76-1 CTD	18.12.2020 02:24	CTD	max depth	54° 42,994'	007° 51,225'	11
M169_77-1 GOFLO	18.12.2020 02:43	GO-FLO	max depth	54° 42,995'	007° 51,226'	11
M169_77-1 GOFLO	18.12.2020 02:50	GO-FLO	max depth	54° 42,994'	007° 51,226'	11
M169_78-1 CTD	18.12.2020 04:22	CTD	max depth	54° 32,097'	007° 54,038'	21
M169_79-1 GOFLO	18.12.2020 04:38	GO-FLO	max depth	54° 32,096'	007° 54,038'	21
M169_79-1 GOFLO	18.12.2020 04:44	GO-FLO	max depth	54° 32,096'	007° 54,038'	21
M169_80-1 CTD	18.12.2020 06:32	CTD	max depth	54° 38,346'	007° 35,822'	24
M169_81-1 GOFLO	18.12.2020 06:49	GO-FLO	max depth	54° 38,346'	007° 35,821'	24
M169_81-1 GOFLO	18.12.2020 06:55	GO-FLO	max depth	54° 38,346'	007° 35,818'	24
M169_82-1 CTD	18.12.2020 09:39	CTD	max depth	54° 20,435'	007° 45,532'	19
M169_83-1 GOFLO	18.12.2020 09:53	GO-FLO	max depth	54° 20,434'	007° 45,533'	18
M169_83-1 GOFLO	18.12.2020 09:59	GO-FLO	max depth	54° 20,434'	007° 45,536'	19
M169_84-1 Pump	18.12.2020 10:33	Pump	max depth	54° 20,434'	007° 45,534'	18
M169_84-1 Pump	18.12.2020 10:50	Pump	on deck	54° 20,436'	007° 45,532'	19
M169_85-1 CTD	18.12.2020 12:01	CTD	max depth	54° 14,616'	007° 53,370'	18
M169_86-1 GOFLO	18.12.2020 12:14	GO-FLO	max depth	54° 14,615'	007° 53,367'	18
M169_86-1 GOFLO	18.12.2020 12:20	GO-FLO	max depth	54° 14,617'	007° 53,369'	18
M169_87-1 CTD	18.12.2020 13:26	CTD	max depth	54° 18,174'	008° 04,658'	14
M169_88-1 GOFLO	18.12.2020 13:37	GO-FLO	max depth	54° 18,173'	008° 04,656'	14
M169_88-1 GOFLO	18.12.2020 13:44	GO-FLO	max depth	54° 18,173'	008° 04,657'	13
M169_89-1 CTD	18.12.2020 14:56	CTD	max depth	54° 24,137'	008° 15,848'	11
M169_90-1 GOFLO	18.12.2020 15:09	GO-FLO	max depth	54° 24,137'	008° 15,852'	11
M169_90-1 GOFLO	18.12.2020 15:14	GO-FLO	max depth	54° 24,136'	008° 15,851'	11
M169_91-1 CTD	18.12.2020 16:47	CTD	max depth	54° 13,832'	008° 19,345'	9
M169_92-1 GOFLO	18.12.2020 16:59	GO-FLO	max depth	54° 13,832'	008° 19,347'	9
M169_92-1 GOFLO	18.12.2020 17:05	GO-FLO	max depth	54° 13,832'	008° 19,346'	9
M169_93-1 CTD	18.12.2020 18:18	CTD	max depth	54° 07,494'	008° 13,119'	13
M169_94-1 GOFLO	18.12.2020 18:31	GO-FLO	max depth	54° 07,494'	008° 13,126'	12
M169_94-1 GOFLO	18.12.2020 18:35	GO-FLO	max depth	54° 07,493'	008° 13,124'	13
M169_94-1 GOFLO	18.12.2020 18:40	GO-FLO	max depth	54° 07,493'	008° 13,123'	13
M169_95-1 CTD	18.12.2020 19:30	CTD	max depth	54° 06,801'	008° 07,634'	15
M169_96-1 GOFLO	18.12.2020 19:49	GO-FLO	max depth	54° 06,801'	008° 07,634'	15
M169_96-1 GOFLO	18.12.2020 20:04	GO-FLO	max depth	54° 06,801'	008° 07,633'	15
M169_96-1 GOFLO	18.12.2020 20:13	GO-FLO	max depth	54° 06,801'	008° 07,633'	14

M169_96-1 GOFLO	18.12.2020 20:38	GO-FLO	max depth	54° 06,801'	008° 07,628'	15
M169_96-1 GOFLO	18.12.2020 20:46	GO-FLO	max depth	54° 06,802'	008° 07,628'	15
M169_96-1 GOFLO	18.12.2020 21:08	GO-FLO	max depth	54° 06,802'	008° 07,627'	15
M169_96-1 GOFLO	18.12.2020 21:15	GO-FLO	max depth	54° 06,802'	008° 07,627'	15
M169_97-1 CTD	18.12.2020 22:06	CTD	max depth	54° 05,702'	008° 04,404'	19
M169_98-1 GOFLO	18.12.2020 22:34	GO-FLO	max depth	54° 05,704'	008° 04,406'	20
M169_98-1 GOFLO	18.12.2020 22:42	GO-FLO	max depth	54° 05,698'	008° 04,409'	19
M169_98-1 GOFLO	18.12.2020 23:21	GO-FLO	max depth	54° 05,697'	008° 04,410'	19
M169_98-1 GOFLO	18.12.2020 23:30	GO-FLO	max depth	54° 05,697'	008° 04,411'	20
M169_99-1 CTD	19.12.2020 00:48	CTD	max depth	54° 03,099'	008° 00,704'	26
M169_100-1 GOFLO	19.12.2020 01:09	GO-FLO	max depth	54° 03,098'	008° 00,704'	25
M169_100-1 GOFLO	19.12.2020 01:19	GO-FLO	max depth	54° 03,099'	008° 00,703'	25
M169_100-1 GOFLO	19.12.2020 01:46	GO-FLO	max depth	54° 03,098'	008° 00,704'	25
M169_100-1 GOFLO	19.12.2020 02:03	GO-FLO	max depth	54° 03,098'	008° 00,702'	25
M169_101-1 Pump	19.12.2020 13:02	Pump	in the water	53° 33,842'	009° 42,539'	11
M169_101-1 Pump	19.12.2020 13:06	Pump	max depth	53° 33,840'	009° 42,557'	11
M169_101-1 Pump	19.12.2020 13:44	Pump	information	53° 33,840'	009° 42,564'	12
M169_102-1 Pump	19.12.2020 15:05	Pump	in the water	53° 37,108'	009° 32,745'	10
M169_102-1 Pump	19.12.2020 15:06	Pump	max depth	53° 37,105'	009° 32,744'	10
M169_102-1 Pump	19.12.2020 15:34	Pump	on deck	53° 37,130'	009° 32,686'	11
M169_103-1 Pump	19.12.2020 17:04	Pump	in the water	53° 46,234'	009° 23,403'	11
M169_103-1 Pump	19.12.2020 17:07	Pump	max depth	53° 46,234'	009° 23,401'	11
M169_103-1 Pump	19.12.2020 17:48	Pump	on deck	53° 46,235'	009° 23,401'	11
M169_104-1 Pump	19.12.2020 19:06	Pump	in the water	53° 50,369'	009° 19,912'	12
M169_104-1 Pump	19.12.2020 19:07	Pump	max depth	53° 50,369'	009° 19,912'	12
M169_105-1 CTD	19.12.2020 19:17	CTD	max depth	53° 50,369'	009° 19,911'	12
M169_104-1 Pump	19.12.2020 20:02	Pump	on deck	53° 50,369'	009° 19,913'	12
M169_106-1 Pump	19.12.2020 21:00	Pump	in the water	53° 50,369'	009° 19,914'	11
M169_106-1 Pump	19.12.2020 21:00	Pump	max depth	53° 50,369'	009° 19,914'	11
M169_107-1 CTD	19.12.2020 21:03	CTD	max depth	53° 50,369'	009° 19,913'	11
M169_106-1 Pump	19.12.2020 21:45	Pump	on deck	53° 50,369'	009° 19,914'	11
M169_108-1 Pump	19.12.2020 23:13	Pump	in the water	53° 50,369'	009° 19,913'	10
M169_108-1 Pump	19.12.2020 23:13	Pump	max depth	53° 50,369'	009° 19,914'	10
M169_109-1 CTD	19.12.2020 23:37	CTD	max depth	53° 50,369'	009° 19,915'	10
M169_108-1 Pump	20.12.2020 00:27	Pump	on deck	53° 50,368'	009° 19,916'	10
M169_110-1 CTD	20.12.2020 01:18	CTD	max depth	53° 50,382'	009° 19,912'	13
M169_111-1 Pump	20.12.2020 01:24	Pump	in the water	53° 50,382'	009° 19,911'	1
M169_111-1 Pump	20.12.2020 01:25	Pump	max depth	53° 50,382'	009° 19,911'	13
M169_111-1 Pump	20.12.2020 01:59	Pump	on deck	53° 50,382'	009° 19,910'	13
M169_112-1 Pump	20.12.2020 02:58	Pump	in the water	53° 50,382'	009° 19,908'	14
M169_112-1 Pump	20.12.2020 02:59	Pump	max depth	53° 50,382'	009° 19,909'	14
M169_113-1 CTD	20.12.2020 03:07	CTD	max depth	53° 50,382'	009° 19,911'	14
M169_112-1 Pump	20.12.2020 03:53	Pump	on deck	53° 50,382'	009° 19,908'	14
M169_114-1 Pump	20.12.2020 04:55	Pump	in the water	53° 50,382'	009° 19,909'	14
M169_114-1 Pump	20.12.2020 05:02	Pump	max depth	53° 50,382'	009° 19,909'	14
M169_115-1 CTD	20.12.2020 05:04	CTD	max depth	53° 50,382'	009° 19,909'	14
M169_114-1 Pump	20.12.2020 05:41	Pump	on deck	53° 50,382'	009° 19,909'	14
M169_116-1 Pump	20.12.2020 06:18	Pump	in the water	53° 50,382'	009° 19,907'	14
M169_116-1 Pump	20.12.2020 06:18	Pump	max depth	53° 50,382'	009° 19,907'	14
M169_117-1 CTD	20.12.2020 06:26	CTD	max depth	53° 50,371'	009° 19,917'	13
M169_116-1 Pump	20.12.2020 06:42	Pump	on deck	53° 50,369'	009° 19,913'	13
M169_118-1 CTD	20.12.2020 08:41	CTD	max depth	53° 52,947'	009° 06,172'	0
M169_119-1 Pump	20.12.2020 08:47	Pump	in the water	53° 52,947'	009° 06,174'	7
M169_119-1 Pump	20.12.2020 08:52	Pump	max depth	53° 52,947'	009° 06,173'	7
M169_119-1 Pump	20.12.2020 09:58	Pump	on deck	53° 51,266'	008° 59,015'	6
M169_120-1 CTD	20.12.2020 10:02	CTD	max depth	53° 51,275'	008° 59,026'	6
M169_121-1 Pump	20.12.2020 10:09	Pump	in the water	53° 51,273'	008° 59,023'	5
M169_121-1 Pump	20.12.2020 10:11	Pump	max depth	53° 51,274'	008° 59,025'	5
M169_121-1 Pump	20.12.2020 10:34	Pump	on deck	53° 51,273'	008° 59,024'	5
M169_122-1 CTD	20.12.2020 12:07	CTD	max depth	53° 50,358'	008° 53,618'	9

M169_123-1 Pump	20.12.2020 12:17	Pump	in the water	53° 50,358'	008° 53,618'	0
M169_123-1 Pump	20.12.2020 12:19	Pump	max depth	53° 50,358'	008° 53,618'	9
M169_123-1 Pump	20.12.2020 12:54	Pump	on deck	53° 50,356'	008° 53,617'	9
M169_124-1 CTD	20.12.2020 13:53	CTD	max depth	53° 52,736'	008° 43,333'	11
M169_125-1 Pump	20.12.2020 14:03	Pump	in the water	53° 52,736'	008° 43,333'	11
M169_125-1 Pump	20.12.2020 14:03	Pump	max depth	53° 52,736'	008° 43,332'	11
M169_125-1 Pump	20.12.2020 16:06	Pump	on deck	53° 52,736'	008° 43,333'	11
M169_126-1 CTD	20.12.2020 16:48	CTD	max depth	53° 56,315'	008° 39,834'	12
M169_127-1 Pump	20.12.2020 16:56	Pump	in the water	53° 56,315'	008° 39,837'	12
M169_127-1 Pump	20.12.2020 16:56	Pump	max depth	53° 56,314'	008° 39,836'	12
M169_127-1 Pump	20.12.2020 17:29	Pump	on deck	53° 56,315'	008° 39,836'	11
M169_128-1 Pump	20.12.2020 18:08	Pump	in the water	53° 57,908'	008° 32,406'	15
M169_128-1 Pump	20.12.2020 18:11	Pump	max depth	53° 57,908'	008° 32,409'	14
M169_128-1 Pump	20.12.2020 19:48	Pump	on deck	54° 01,592'	008° 14,686'	8
M169_129-1 CTD	20.12.2020 20:13	CTD	max depth	54° 02,290'	008° 14,574'	8
M169_130-1 GOFLO	20.12.2020 20:24	GO-FLO	max depth	54° 02,290'	008° 14,574'	8
M169_130-1 GOFLO	20.12.2020 20:28	GO-FLO	max depth	54° 02,290'	008° 14,574'	0
M169_131-1 CTD	21.12.2020 02:17	CTD	max depth	54° 17,918'	006° 46,099'	34
M169_132-1 GOFLO	21.12.2020 02:35	GO-FLO	max depth	54° 17,916'	006° 46,100'	34
M169_132-1 GOFLO	21.12.2020 02:46	GO-FLO	max depth	54° 17,916'	006° 46,098'	34
M169_132-1 GOFLO	21.12.2020 03:28	GO-FLO	max depth	54° 17,915'	006° 46,099'	33
M169_132-1 GOFLO	21.12.2020 03:39	GO-FLO	max depth	54° 17,915'	006° 46,098'	34
M169_133-1 CTD	21.12.2020 06:42	CTD	max depth	54° 38,229'	006° 09,890'	36
M169_134-1 GOFLO	21.12.2020 06:59	GO-FLO	max depth	54° 38,228'	006° 09,889'	35
M169_134-1 GOFLO	21.12.2020 07:14	GO-FLO	max depth	54° 38,229'	006° 09,889'	36
M169_134-1 GOFLO	21.12.2020 07:58	GO-FLO	max depth	54° 38,228'	006° 09,891'	35
M169_134-1 GOFLO	21.12.2020 08:02	GO-FLO	max depth	54° 38,228'	006° 09,890'	35
M169_134-1 GOFLO	21.12.2020 08:08	GO-FLO	max depth	54° 38,227'	006° 09,892'	36
M169_135-1 CTD	21.12.2020 09:59	CTD	max depth	54° 37,479'	005° 43,448'	38
M169_136-1 GOFLO	21.12.2020 10:18	GO-FLO	max depth	54° 37,479'	005° 43,445'	38
M169_136-1 GOFLO	21.12.2020 10:28	GO-FLO	max depth	54° 37,479'	005° 43,448'	38
M169_136-1 GOFLO	21.12.2020 11:06	GO-FLO	max depth	54° 37,478'	005° 43,446'	37
M169_136-1 GOFLO	21.12.2020 11:11	GO-FLO	max depth	54° 37,478'	005° 43,448'	38
M169_137-1 CTD	21.12.2020 13:16	CTD	max depth	54° 53,692'	005° 34,361'	37
M169_138-1 GOFLO	21.12.2020 13:33	GO-FLO	max depth	54° 53,692'	005° 34,360'	37
M169_138-1 GOFLO	21.12.2020 13:46	GO-FLO	max depth	54° 53,692'	005° 34,360'	39
M169_138-1 GOFLO	21.12.2020 14:18	GO-FLO	max depth	54° 53,691'	005° 34,362'	37
M169_138-1 GOFLO	21.12.2020 14:23	GO-FLO	max depth	54° 53,690'	005° 34,365'	39
M169_138-1 GOFLO	21.12.2020 14:33	GO-FLO	max depth	54° 53,691'	005° 34,362'	37
M169_138-1 GOFLO	21.12.2020 14:40	GO-FLO	max depth	54° 53,692'	005° 34,362'	37
M169_139-1 CTD	21.12.2020 20:03	CTD	max depth	55° 20,425'	006° 07,106'	45
M169_140-1 GOFLO	21.12.2020 20:22	GO-FLO	max depth	55° 20,424'	006° 07,105'	43
M169_140-1 GOFLO	21.12.2020 20:33	GO-FLO	max depth	55° 20,424'	006° 07,106'	45
M169_140-1 GOFLO	21.12.2020 20:43	GO-FLO	max depth	55° 20,422'	006° 07,104'	45
M169_140-1 GOFLO	21.12.2020 20:54	GO-FLO	max depth	55° 20,422'	006° 07,106'	44
M169_140-1 GOFLO	21.12.2020 21:31	GO-FLO	max depth	55° 20,423'	006° 07,106'	43
M169_140-1 GOFLO	21.12.2020 21:37	GO-FLO	max depth	55° 20,423'	006° 07,105'	46
M169_141-1 CTD	22.12.2020 03:03	CTD	max depth	54° 46,523'	006° 18,285'	35
M169_142-1 GOFLO	22.12.2020 03:24	GO-FLO	max depth	54° 46,521'	006° 18,282'	35
M169_142-1 GOFLO	22.12.2020 03:35	GO-FLO	max depth	54° 46,524'	006° 18,282'	36
M169_142-1 GOFLO	22.12.2020 04:18	GO-FLO	max depth	54° 46,520'	006° 18,280'	35
M169_142-1 GOFLO	22.12.2020 04:24	GO-FLO	max depth	54° 46,521'	006° 18,282'	36
M169_142-1 GOFLO	22.12.2020 04:27	GO-FLO	max depth	54° 46,520'	006° 18,280'	35
M169_143-1 CTD	22.12.2020 07:14	CTD	max depth	55° 11,993'	006° 42,995'	37
M169_144-1 GOFLO	22.12.2020 07:32	GO-FLO	max depth	55° 11,996'	006° 42,996'	36
M169_144-1 GOFLO	22.12.2020 07:42	GO-FLO	max depth	55° 11,995'	006° 42,996'	39
M169_144-1 GOFLO	22.12.2020 08:08	GO-FLO	max depth	55° 11,998'	006° 42,994'	36
M169_144-1 GOFLO	22.12.2020 08:13	GO-FLO	max depth	55° 11,998'	006° 42,996'	37
M169_145-1 GOFLO	22.12.2020 11:10	GO-FLO	max depth	54° 50,615'	007° 05,161'	23
M169_145-1 GOFLO	22.12.2020 11:19	GO-FLO	max depth	54° 50,615'	007° 05,163'	23

M169_146-1 CTD	22.12.2020 13:53	CTD	max depth	55° 06,898'	007° 34,102'	17
M169_147-1 GOFLO	22.12.2020 14:08	GO-FLO	max depth	55° 06,899'	007° 34,100'	17
M169_147-1 GOFLO	22.12.2020 14:18	GO-FLO	max depth	55° 06,898'	007° 34,100'	18
M169_148-1 CTD	22.12.2020 16:04	CTD	max depth	55° 04,625'	007° 59,104'	15
M169_149-1 GOFLO	22.12.2020 16:20	GO-FLO	max depth	55° 04,623'	007° 59,106'	14
M169_149-1 GOFLO	22.12.2020 16:24	GO-FLO	max depth	55° 04,622'	007° 59,101'	14
M169_150-1 CTD	22.12.2020 17:42	CTD	max depth	54° 57,307'	008° 10,281'	9
M169_151-1 GOFLO	22.12.2020 17:55	GO-FLO	max depth	54° 57,306'	008° 10,281'	10
M169_151-1 GOFLO	22.12.2020 18:00	GO-FLO	max depth	54° 57,306'	008° 10,282'	10
M169_151-1 GOFLO	22.12.2020 18:12	GO-FLO	max depth	54° 57,306'	008° 10,279'	10
M169_151-1 GOFLO	22.12.2020 18:16	GO-FLO	max depth	54° 57,305'	008° 10,280'	10
M169_151-1 GOFLO	22.12.2020 18:22	GO-FLO	max depth	54° 57,306'	008° 10,279'	11
M169_151-1 GOFLO	22.12.2020 18:28	GO-FLO	max depth	54° 57,305'	008° 10,281'	9
M169_152-1 GOFLO	22.12.2020 19:48	GO-FLO	max depth	54° 49,210'	007° 58,844'	11
M169_152-1 GOFLO	22.12.2020 19:54	GO-FLO	max depth	54° 49,210'	007° 58,844'	11
M169_153-1 CTD	22.12.2020 23:03	CTD	max depth	54° 35,878'	007° 15,301'	25
M169_154-1 GOFLO	22.12.2020 23:18	GO-FLO	max depth	54° 35,877'	007° 15,297'	0
M169_154-1 GOFLO	22.12.2020 23:25	GO-FLO	max depth	54° 35,878'	007° 15,302'	27
M169_155-1 CTD	23.12.2020 08:07	CTD	max depth	54° 10,024'	006° 58,287'	39
M169_156-1 GOFLO	23.12.2020 08:27	GO-FLO	max depth	54° 10,024'	006° 58,286'	40
M169_156-1 GOFLO	23.12.2020 08:36	GO-FLO	max depth	54° 10,024'	006° 58,288'	38
M169_156-1 GOFLO	23.12.2020 08:47	GO-FLO	max depth	54° 10,024'	006° 58,287'	39
M169_156-1 GOFLO	23.12.2020 09:20	GO-FLO	max depth	54° 10,022'	006° 58,256'	39
M169_156-1 GOFLO	23.12.2020 09:25	GO-FLO	max depth	54° 10,022'	006° 58,258'	40
M169_157-1 MB_PS	23.12.2020 09:54	Multibeam and Parasound Profile	recording start	54° 10,023'	006° 58,258'	38
M169_157-1 MB_PS	24.12.2020 00:51	Multibeam and Parasound Profile	profile end	54° 09,690'	006° 58,213'	37
M169_158-1 CTD	24.12.2020 03:12	CTD	max depth	54° 07,383'	007° 26,242'	35
M169_159-1 GOFLO	24.12.2020 03:31	GO-FLO	max depth	54° 07,383'	007° 26,242'	35
M169_159-1 GOFLO	24.12.2020 03:41	GO-FLO	max depth	54° 07,383'	007° 26,242'	35
M169_159-1 GOFLO	24.12.2020 04:08	GO-FLO	max depth	54° 07,383'	007° 26,243'	35
M169_159-1 GOFLO	24.12.2020 04:13	GO-FLO	max depth	54° 07,383'	007° 26,243'	35
M169_160-1 CTD	24.12.2020 04:44	CTD	max depth	54° 06,658'	007° 27,661'	36
M169_161-1 GOFLO	24.12.2020 05:02	GO-FLO	max depth	54° 06,658'	007° 27,661'	35
M169_161-1 GOFLO	24.12.2020 05:11	GO-FLO	max depth	54° 06,658'	007° 27,661'	35
M169_161-1 GOFLO	24.12.2020 05:50	GO-FLO	max depth	54° 06,658'	007° 27,665'	35
M169_161-1 GOFLO	24.12.2020 05:56	GO-FLO	max depth	54° 06,658'	007° 27,667'	35
M169_162-1 CTD	24.12.2020 07:37	CTD	max depth	54° 08,741'	007° 51,628'	54
M169_163-1 GOFLO	24.12.2020 08:04	GO-FLO	max depth	54° 08,741'	007° 51,626'	54
M169_163-1 GOFLO	24.12.2020 08:32	GO-FLO	max depth	54° 08,744'	007° 51,619'	53
M169_163-1 GOFLO	24.12.2020 08:52	GO-FLO	max depth	54° 08,751'	007° 51,596'	54
M169_163-1 GOFLO	24.12.2020 09:23	GO-FLO	max depth	54° 08,753'	007° 51,588'	55
M169_163-1 GOFLO	24.12.2020 09:42	GO-FLO	max depth	54° 08,768'	007° 51,547'	0
M169_163-1 GOFLO	24.12.2020 10:03	GO-FLO	max depth	54° 08,770'	007° 51,539'	55
M169_163-1 GOFLO	24.12.2020 10:18	GO-FLO	max depth	54° 08,771'	007° 51,538'	53
M169_164-1 CTD	24.12.2020 11:13	CTD	max depth	54° 09,393'	007° 54,670'	17
M169_165-1 GOFLO	24.12.2020 11:27	GO-FLO	max depth	54° 09,393'	007° 54,670'	17
M169_165-1 GOFLO	24.12.2020 11:34	GO-FLO	max depth	54° 09,393'	007° 54,670'	17
M169_165-1 GOFLO	24.12.2020 12:04	GO-FLO	max depth	54° 09,393'	007° 54,670'	17
M169_165-1 GOFLO	24.12.2020 12:09	GO-FLO	max depth	54° 09,393'	007° 54,671'	0
M169_166-1 Pump	25.12.2020 14:46	Pump	in the water	53° 16,002'	008° 29,083'	9
M169_166-1 Pump	25.12.2020 15:13	Pump	on deck	53° 16,002'	008° 29,083'	9
M169_167-1 Pump	25.12.2020 16:29	Pump	in the water	53° 20,405'	008° 29,833'	8
M169_167-1 Pump	25.12.2020 17:00	Pump	on deck	53° 20,403'	008° 29,834'	9
M169_168-1 Pump	25.12.2020 18:12	Pump	in the water	53° 24,873'	008° 29,621'	9
M169_168-1 Pump	25.12.2020 19:33	Pump	on deck	53° 24,875'	008° 29,621'	10
M169_169-1 Pump	25.12.2020 19:33	Pump	information	53° 24,875'	008° 29,621'	10

M169_169-1 Pump	25.12.2020 20:00	Pump	on deck	53° 24,875'	008° 29,622'	10
M169_170-1 Pump	25.12.2020 20:00	Pump	in the water	53° 24,875'	008° 29,622'	10
M169_170-1 Pump	25.12.2020 20:27	Pump	on deck	53° 24,875'	008° 29,619'	10
M169_171-1 Pump	25.12.2020 20:41	Pump	in the water	53° 26,017'	008° 29,546'	8
M169_171-1 Pump	25.12.2020 21:03	Pump	on deck	53° 27,015'	008° 29,432'	9
M169_172-1 Pump	25.12.2020 21:04	Pump	in the water	53° 27,033'	008° 29,430'	9
M169_172-1 Pump	25.12.2020 21:30	Pump	on deck	53° 28,628'	008° 29,675'	9
M169_173-1 Pump	25.12.2020 21:30	Pump	in the water	53° 28,650'	008° 29,680'	9
M169_173-1 Pump	25.12.2020 22:02	Pump	on deck	53° 30,641'	008° 31,765'	11
M169_174-1 Pump	25.12.2020 23:16	Pump	in the water	53° 31,348'	008° 33,723'	10
M169_175-1 CTD	25.12.2020 23:23	CTD	in the water	53° 31,347'	008° 33,724'	10
M169_175-1 CTD	25.12.2020 23:24	CTD	max depth	53° 31,347'	008° 33,724'	10
M169_174-1 Pump	25.12.2020 23:52	Pump	information	53° 31,347'	008° 33,724'	10
M169_176-1 CTD	26.12.2020 01:14	CTD	in the water	53° 31,348'	008° 33,723'	9
M169_176-1 CTD	26.12.2020 01:14	CTD	max depth	53° 31,348'	008° 33,723'	8
M169_177-1 Pump	26.12.2020 01:20	Pump	information	53° 31,348'	008° 33,723'	8
M169_177-1 Pump	26.12.2020 01:57	Pump	information	53° 31,348'	008° 33,722'	8
M169_178-1 CTD	26.12.2020 03:21	CTD	in the water	53° 31,348'	008° 33,722'	8
M169_179-1 Pump	26.12.2020 03:21	Pump	information	53° 31,348'	008° 33,722'	8
M169_178-1 CTD	26.12.2020 03:22	CTD	max depth	53° 31,348'	008° 33,722'	8
M169_179-1 Pump	26.12.2020 04:12	Pump	information	53° 31,356'	008° 33,740'	10
M169_180-1 CTD	26.12.2020 05:19	CTD	in the water	53° 31,351'	008° 33,741'	11
M169_181-1 Pump	26.12.2020 05:19	Pump	information	53° 31,351'	008° 33,742'	11
M169_180-1 CTD	26.12.2020 05:20	CTD	max depth	53° 31,351'	008° 33,742'	11
M169_181-1 Pump	26.12.2020 05:55	Pump	information	53° 31,352'	008° 33,744'	11
M169_182-1 CTD	26.12.2020 07:22	CTD	in the water	53° 31,352'	008° 33,742'	12
M169_182-1 CTD	26.12.2020 07:23	CTD	max depth	53° 31,352'	008° 33,744'	12
M169_183-1 Pump	26.12.2020 07:24	Pump	in the water	53° 31,351'	008° 33,744'	12
M169_183-1 Pump	26.12.2020 07:49	Pump	on deck	53° 31,352'	008° 33,746'	13
M169_184-1 Pump	26.12.2020 08:55	Pump	in the water	53° 31,352'	008° 33,745'	13
M169_185-1 CTD	26.12.2020 09:26	CTD	in the water	53° 31,352'	008° 33,744'	13
M169_185-1 CTD	26.12.2020 09:27	CTD	max depth	53° 31,352'	008° 33,745'	13
M169_184-1 Pump	26.12.2020 10:33	Pump	on deck	53° 31,347'	008° 33,725'	11
M169_186-1 Pump	26.12.2020 11:30	Pump	in the water	53° 31,347'	008° 33,725'	11
M169_186-1 Pump	26.12.2020 11:59	Pump	on deck	53° 31,347'	008° 33,724'	11
M169_187-1 CTD	26.12.2020 12:00	CTD	in the water	53° 31,347'	008° 33,724'	11
M169_187-1 CTD	26.12.2020 12:01	CTD	max depth	53° 31,347'	008° 33,724'	11
M169_188-1 Pump	28.12.2020 08:04	Pump	in the water	53° 37,429'	008° 28,541'	9
M169_188-1 Pump	28.12.2020 08:28	Pump	on deck	53° 37,976'	008° 26,946'	14
M169_189-1 Pump	28.12.2020 08:38	Pump	in the water	53° 38,312'	008° 26,103'	12
M169_189-1 Pump	28.12.2020 08:57	Pump	on deck	53° 38,878'	008° 24,709'	14
M169_190-1 Pump	28.12.2020 09:22	Pump	in the water	53° 40,705'	008° 21,976'	13
M169_190-1 Pump	28.12.2020 09:55	Pump	on deck	53° 42,107'	008° 19,792'	18
M169_191-1 Pump	28.12.2020 10:57	Pump	in the water	53° 48,875'	008° 07,174'	15
M169_191-1 Pump	28.12.2020 11:33	Pump	on deck	53° 50,175'	008° 04,395'	13