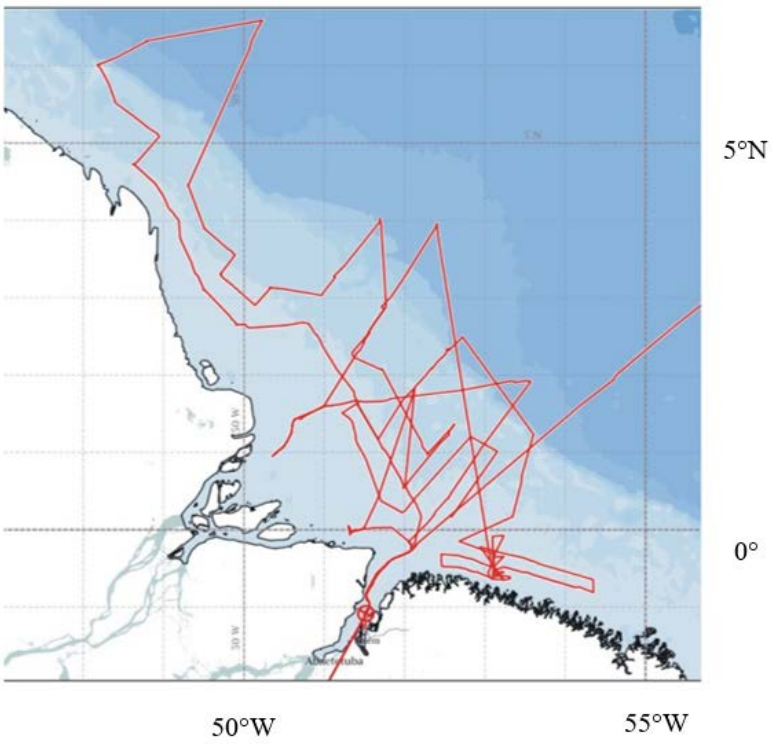
Name: Prof. Dr. Andrea Koschinsky
Institute: Jacobs University Bremen,
Department of Physics and Earth Sciences
Campus Ring, D-28759 Bremen
Tel.: +49-421-2003567, Fax: +49-421-2003102
Email: a.koschinsky@jacobs-university.de

Name: Prof. Dr. Martin Frank
Institute: GEOMAR, Helmholtz Centre for Ocean Research Kiel
Wischhofstrasse 1-3, D-24148 Kiel
Tel.: +49-431-6002218, Fax: +49-431-6002925
Email: mfrank@geomar.de

Short Cruise Report
Meteor Cruise No. M147

Las Palmas (Gran Canary) – Belém (Brazil)
19.04.2018 – 21.05.2018

Chief Scientist: Andrea Koschinsky / Martin Frank
Captain: Rainer Hammacher



Objectives

Meteor Cruise No.M147 (Amazon – GEOTRACES) carried out research in the mixing zone of the Pará and the Amazon River estuaries and also its associated plume in the Atlantic during the high discharge period from the end of April until late May of 2018. The focus was on the biochemistry of the trace metals and dissolved organic matter (DOM) as well as the isotopic characterization of water masses and mixing processes. The main research topic is to determine in detail the distribution and speciation of trace elements along the salinity gradients in the mixing zone of the Amazon River estuary and its freshwater plume in order to quantify their biogeochemical cycling, the riverine contribution to open the ocean metal budgets, and its interaction with DOM and particulate matter. The scientific goals of this research include an assessment on the role of the Amazon River towards the input of trace metals and DOM into the Atlantic and also to understand the interactions between trace metals and DOM as well as how they impact the biogeochemical cycling and fluxes of these components. Due to the complexation with DOM, the trace metal flux to the ocean will likely be enhanced in competition with removal via colloidal coagulation and sedimentation. Additional factors to consider apart from those aforementioned in the goals are the associations between the trace metals and the different physically defined pools of matter (truly dissolved, organic colloids, inorganic colloids, particles) along the salinity gradient between the river and the ocean.

Our work on board comprised the collection of water and sediment samples with a standard CTD-rosette sampler, a trace-metal clean CTD-rosette sampler, a towed surface fish, a pump for large volumes, and a multicorer. Onboard methods included sample pretreatment including filtration, preservation, and preconcentration on columns, as well as analysis of nutrients. In order to investigate the role of colloid transformation in the mixing zone on the net trace metal and DOM fluxes along the salinity gradient into the Atlantic, selected samples were filtered with membrane filters of different pore sizes and ultrafiltration. A variety of samples were taken for the characterization of the molecular composition and the origin of the metal-binding and other forms of DOM.

The type of trace metals which we will consider for this research are micronutrients (Fe, Mn, Cu, Ni, Co, Zn, Mo, V), particle reactive elements such as Ti, Zr, Hf, Nb, W, rare earth elements and yttrium (REY), and Hg as a potential tracer for anthropogenic metal input. For a better understanding of the geochemical reactivity and the bioavailability of trace metals we will investigate the chemical speciation of the trace metals (including redox speciation and organic complexation by the metal-binding DOM) from the freshwater endmember into the seawater endmember. Our objectives include the characterization of net Ba, Nd and Hf isotopic fluxes from the Amazon into the Atlantic Ocean from dissolved and suspended sediment sources, the assessment of the source of trace metals and water masses, the tracing of the mixing processes, and also the advection and mixing of the plume via the combination of radiogenic Nd and Ra isotopes. For assessing the role of particles and sediments as sources and sinks to the metal and DOM fluxes, surface sediment samples obtained with the multicorer (up to 30 cm long cores) were separated into distinct layers, from which the pore waters were extracted. The solid samples were kept for the succeeding geochemical analysis in the home labs.

In combination with a planned second cruise during the low discharge period, this cruise will contribute towards comparing the trace metal and DOM characterization and flux during the periods of high and low riverine discharge and will allow an assessment of the average annual supply of the trace metals and the dynamics of their fluxes into the ocean.

The combined results will provide new insights into the potential impact of climate change and changed land usage in the Amazon catchment area on metal-DOM fluxes and interactions and its role in the Atlantic biogeochemical cycling of metals and also its association towards bioproductivity.

The cruise is an official process study for the internationally coordinated GEOTRACES program.

Narrative

Cruise M147 started in Las Palmas, Canary Islands. Initially a group of 12 scientists from GEOMAR, Kiel, Jacobs University Bremen and the University of Oldenburg and an observer from Brazil arrived in Las Palmas between 16 to 18 April, 2018. All containers from Germany had already arrived and thus the installation of the trace metal clean CTD-rosette equipped with 24 x 12 liter GO-FLO water samplers and the mobile winch with an 8 km plastic coated conducting cable of GEOMAR could start immediately. These devices were essential for contamination-free sampling of seawater. The clean lab container of GEOMAR served as clean laboratory space. On 19th April at 9:00 a.m. RV Meteor left Las Palmas on the 19th of April at 9.00 a.m. The scientists set up the laboratories testing devices and the methods while they travelled to Belém for 10 days. Glove boxes were set up in some of the laboratories to guarantee clean laboratory handling of contamination-prone trace elements and their isotopic compositions. The equipment for sediment sampling and pore water extraction was established and additionally, the ultrafiltration devices were assembled and tested.

On the way to the south, the towed surface fish was used for the first time to pump water into the clean-room container to carry out an experiment with dissolved organic matter (DOM), for which the organic matter was extracted, concentrated, and preserved for subsequent work. In addition to the use of the towed surface fish, the trace-metal clean rosette sampler with CTD was deployed to recover 400 liters of seawater from a depth of 500 m for a further experiment with DOM. Another 400 liters were taken from a depth of 1000 m as a reference sample for the international GEOTRACES program. The water was filtered and aliquots were filled into bottles that measure 0.5 liters in the clean laboratory of GEOMAR

The second group of scientists from Jacobs University Bremen, GEOMAR, the University of Kiel, ICBM at the University of Oldenburg, and all the Brazilian project partners from four different institutions and locations arrived in Belém on the 28th of April. The group boarded the RV Meteor early in the afternoon on April 29th through a transfer made with a boat from Mosqueiro Station. The ship made its way back through the shipping canal of the Rio Pará around 5 p.m. and three hours later we started sampling the surface water of the river as one of the endmembers of the estuarine mixing zone using the towed fish. The newly arrived scientists set up their lab equipment and integrated themselves into the thematic working groups that were formed during the transit, which allowed a very fast and efficient start to the full sampling program. The next morning, four standard CTD-rosette stations, three trace-metal CTD-rosette stations, and two multicorer stations were deployed in the outflow zone of the Rio Pará and along a section towards the northeast as soon as we left the shipping canal. A surface pump was deployed at most stations to attain large volumes

of water, which were pumped across manganese fibers to adsorb the dissolved radium that is applied as a tracer for the last contact of the respective waters with the coastal or shelf area. The first section was completed on May 1st which included sampling the seawater endmember with the CTD rosette samplers and the multicorer in a water depth >2000 m. All stations were successful and delivered an impressive number of samples to the different laboratories, challenging the different groups with a large diversity of material and with an extremely high particle load of the water samples from the river endmember and the proximal river plume. Methods were partly to be adapted in order to deal with the specific properties of the samples. In addition, there were short transit times between the stations, strong tidal effects, a shallow water depth of only 10-20 m over the large distance along the estuary and the shelf that required specific navigation and sampling strategies. The station work was often affected by extremely strong rain showers, as we were in a region where it was the end of the rainy season during the time of high discharge of water from the Amazon River. However, as everyone from the scientific team and the ship's crew contributed their best to find solutions for all the situations, the sampling schemes could be kept as planned and only the station sequences had to be adapted to the extended periods of time which were needed for processing the samples between the stations. While most samples were processed for storage and for later analysis via sensitive and highly sophisticated methods in home laboratories, some data were already produced onboard which helped to refine the sampling strategies. These include dissolved nutrient analyses (nitrate, phosphate, silicate), dissolved oxygen, and radium isotopes which were plotted against the salinity gradients along the sections. In addition, some trace metal concentrations and species were already analyzed with voltammetry methods in one of the ship labs. Furthermore, river water - seawater mixing experiments and photodegradation experiments with DOM were carried out onboard.

The ship then steamed towards Canal do Norte, the northern outflow channel of the Amazon river, to occupy a salinity section perpendicular to the coastline and parallel to the Rio Pará salinity section. We started CTD-rosette and multicorer sampling at the wide sandbank which during low tide is partly shallower than 10 m and separates the estuary from the extended shelf area. At high tide, the ship then crossed the sandbank into the Canal do Norte and steamed a few hours upstream to meet the river endmember at a salinity below 0.1. Nevertheless, all measured values remained slightly above this value. We sampled the river water and sediment at the southwestern-most point of the planned section and then steamed back in order to cross the sandbank again at the next high tide. From there, we slowly continued towards the northeast and stopped to sample with the CTD-rosette and the fish as soon as our chosen salinities of 1 – 2 – 3 – 4 – 6 – 9 – 14 - 20 - 27 had been reached at water depths between 15 and 100 m. The northernmost point again represented the seawater salinity endmember of 35 at a water depth of about 2000 m, where a multicorer was also taken.

From the end point of this section, we had a longer transit of about 28 hours to the mangrove belt which was southeast of the Pará river mouth slightly south to the equator. This gave the scientists an opportunity to catch up with the processing of the remaining samples and also to get some sleep. In the morning of the 5th of May, a longer salinity section including a CTD and pump sampling campaign started along the coastline, as close to the coast as the shallow water depth and some obstacles allowed us to go. While to the east of 47°W, we had to keep a distance of about 20 nm to the shoreline, nevertheless we were

able to go as close as 10 m around the contour line on the western side towards the Rio Pará. A second section was performed at a distance of 10 nm from the nearshore section. Throughout the whole sampling campaign, the salinity of the water was significantly reduced (down to 15 PSU) and the water had a greenish color from high amounts of algae which was a clear indication of the enormous outflow of relatively fresh groundwater and the strongly enhanced biological productivity in this area. Similar to the mangroves in other parts of the world, this mangrove belt plays a very important role in the carbon budget and it is a major contributor of DOM to the ocean. The radium isotope measurements confirmed the far-reaching impact of these waters, while further to the west the northward directed surface currents merge them with the dominant freshwater plumes of the Rio Pará and the Amazon.

On May 7th around noon, we left the area and steamed north, while continuing the salinity records and surface water sampling with the towed fish. About 24 hours later we started the salinity section from the ocean endmember towards the Canal do Sul, the southern outflow channel of the Amazon at 2°20'N 47°28'W. We sampled the seawater endmember at a station which was about 1030 m deep with both CTD-rosette systems, the pumps, and the multicorer and then followed the salinity gradient towards the river endmember in southwesterly direction. However, after the first few stations, the constraints of the tidal cycles forced us to interrupt the sampling along the selected salinity, and we had to steam south to the sandbank to be able to still cross it at high tide. We were not able to go further up the river because of the very shallow and the incompletely mapped bathymetry in the Canal do Sul but since the salinity was already as low as 0.03 PSU directly behind the sandbank, we sampled the river endmember with CTD-rosette and pump at two different positions and also took sediment cores. With the incoming high tide, we covered the salinity points of 1,2, and 4 before crossing the sandbank again in the evening of May 9, from where we had to return to Belém due to a medical emergency.

We then returned to the sampling track of the salinity section of the southern Amazon outflow, which we had left two days earlier. On the way there, in the evening of May 10, we included a 20 m deep station at 48°W in the middle between the Pará and the southern Amazon channel outflows, which marked the first point of our next sampling section along the plume during its northwesterly advection with the surface currents. We took water and sediment samples and then met the salinity section of the Amazon-south profile again in early morning of 11th of May. Salinity points 21, 16, 12, 9 and 6 PSU were covered with regular CTD-rosette and pumps. Sampling of sediment proved to be difficult at a water depth range between 40 and 50 m. The sediment was very coarse-grained and difficult to penetrate and also the porewater sampling was not possible. The sediment closer to the river outflow, however, mainly consisted of liquefied mud without any layered structure because it is apparently continuously resuspended by the tidal currents. Thus, sampling of the pore water and discrete solid layers was only possible to a very limited extent.

After the last salinity point of 6 which was covered in the afternoon of 11th of May, we started to move further southeast to meet the long SE-NW section following the advection of the plume along the shore on the 20 m depth contour line, which brought us north into the EEZ of French Guiana after one and a half days. Intense fishing activities with nets and fishing lines floating along large parts of the section required special attention by the crew on the bridge and the sampling points partly had to be slightly relocated. We sampled the surface water with regular CTD-rosette, fish and pump about every 35 nm at 13 different locations in order to investigate the biogeochemical processes prevailing in the plume. Also,

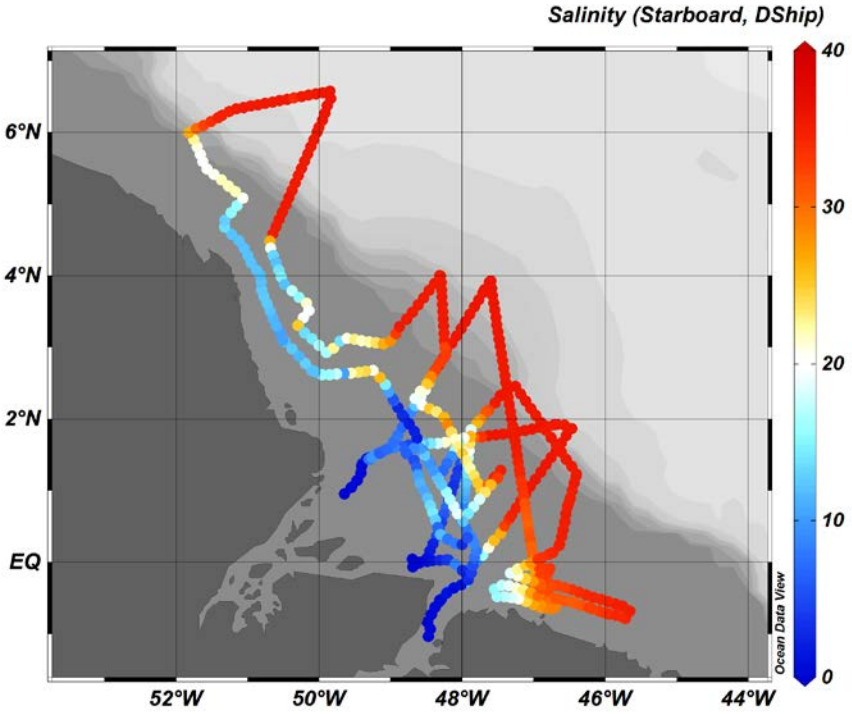
at three of these locations the surface sediment was recovered with the multicorer, providing a good sample recovery with structured sediments that could be sampled in depth intervals.

Since we had to stay out of the 50 nm mile zone of the EEZ of French Guiana, we moved further away from the coast towards the northeast on 13th of May as soon as we had reached the border between Brazil and French Guiana. Since in this region we were north of the intertropical convergence zone ITCZ, we had stable dry weather conditions. While the freshwater plume flows northward in a rather small strip along the coast up to about 5°N, from here it widens notably and reaches further into the Atlantic. We investigated the extension of the Amazon River plume into the Atlantic by a first station at about 5°N 51'W and then moved further to the northeast up to 6°29'N 50°35'W using stainless steel and trace-metal clean CTD-rosette sampler systems as well as one multicorer station. On our northeastern-most station at 6°35'N 51°12'W we had transparent blue water for the first time, with a salinity of more than 35, which was a clear indication that we had left the freshwater plume behind us and that we had the pure seawater endmember of the Atlantic under the keel for the first time in two weeks. Due to a problem with the frame of the trace-metal clean CTD system we had to stop its use at some point during this transect and from then on could only use individual GoFlo-bottles from the rosette sampler on a Kevlar rope. This also affected our intercalibration station of the GEOTRACES program, close to a point were earlier the different water masses were sampled and analysed within the framework of the GEOTRACES program. Our renewed sampling allows a comparison of the data at different times and from the different institutions.

On the 15th of May we started our plume transect back from northwest to southeast, moving about 30 nautical miles east of the previous transect And following a line parallel to the SE-NW transect approximately on the 40-50 m depth contour line. The water column was sampled at all stations and one more surface sediment station using the multicorer was carried out. The sampling program was structured similarly to the previous one and was only interrupted to cover missing stations and salinity points of the Amazon outflow transects along the NW-directed salinity gradient into the Atlantic. Among others, we included one deep station at about 1000 m depth to complete a mixing transect from the northern Amazon outflow channel into the Atlantic. The significant impact of the tidal currents on the exact position and distribution of the mixing zones and salinity points required a repeated adaptation of the station plans to the local conditions. Again, the occasionally very intense fishing activities with boats and nets impacted our straight-line profiles. The last days were used to close further gaps in the sampling grid and to finish all profiles. After the last water column sample had been taken with a GoFlo bottle, we used the remaining time for salinity and CO_2 recordings parallel to the coastline along the 10 m depth contour line between the Amazon river and the Rio Pará, another section along the Rio Pará mixing transect, and then back to the shipping canal of the Rio Pará from where we approached the port of Belém. Data recording was finished on May 20 in the early morning.

At the end of the journey, we had covered all river and seawater endmembers and the whole mixing zone between the EEZ of French Guiana at 6°N and 1°S in the mangrove groundwater discharge area southeast of the Rio Pará, according to the original plan. The total profile and sampling track of cruise M147 shown on the cover page includes 74 standard CTD-rosette samplers, 15 trace-metal clean rosettes, 10 single GoFlo-bottles, 60 pumps for radium samples, 107 surface samples with the towed fish and 22 multicorer stations. Salinity data and CO_2 readings in the surface water were carried out continuously

during the whole time. Based on the salinity data, we now already have a good overview of the spread of the freshwater outflow and its impact on biological and biogeochemical processes within the region, which can be assessed based on the nutrient data (nitrate, phosphate, silicate) produced onboard. The first evaluation of the radium isotope data gives hints about the influence of the ground water discharges of the mangrove belt on the composition of the water masses and the temporal frame of the water mass movement to the northwest.



Salinity gradients in the surface water based on DSHIP data recorded during M147, plotted with Ocean Data Viewer (Martha Gledhill).

Acknowledgements

Our special thank goes to Captain Rainer Hammacher and his crew for the very friendly and cooperative atmosphere and their competent technical assistance for our various pieces of equipment on board, in particular considering the challenging working environment in the very shallow and dynamic estuary and shelf area of the Amazon River. Furthermore, we acknowledge the German Research Fleet Coordination Centre and the Office of Foreign Affairs (Auswärtiges Amt) for providing logistical and administrative support. We also recognize the continuous support of our Brazilian colleagues and the Brazilian observer Almir Freire Peireira in all aspects of the cruise organization. This cruise was funded by the Deutsche Forschungsgemeinschaft (DFG).

List of Participants

Name	*Task*	*Institute*
1. Koschinsky, Andrea, Prof. Dr.	Chief Scientist, trace metals	Jacobs Univ.
2. Frank, Martin, Prof. Dr.	(Co-)Chief scientist, radiogenic isotopes, trace metal clean winch	GEOMAR
3. Dittmar, Thorsten, Prof. Dr.	DOM sampling and experiments	Univ. Oldenburg
4. Scholten, Jan	Ra isotopes, in situ pump	Univ. Kiel
5. Gledhill, Martha, Dr.	Trace metal sampling, organization of clean laboratory	GEOMAR
6. Hathorne, Ed C., Dr.	Trace metal and radiogenic isotope sampling	GEOMAR
7. Border, Evan	CTD-Watch	Univ. Heidelberg
8. Spiegel, Timo	CTD-Watch	GEOMAR
9. Vosteen, Paul	Multicorer stations	GEOMAR
10. Mutzberg, Andre	Nutrient analysis onboard	GEOMAR
11. Leist, Lisa	Nutrient analysis onboard	GEOMAR
12. Bretschneider, Lisa	Oxygen determination and sampling for radiogenic isotopes	GEOMAR
13. Lodeiro, Pablo, Dr.	Trace metal sampling	GEOMAR
14. Seidel, Michael, Dr.	DOM sampling and experiments	Univ. Oldenburg
15. Knoke, Melina	DOM sampling and experiments	Univ. Oldenburg
16. Heinrich, Luise	Ultrafiltration	Jacobs Univ.
17. Paul, Sophie	Trace metals and sediments	Jacobs Univ.
18. Zitoun, Rebecca	Trace metal sampling	Jacobs Univ./Univ. Otago
19. Fronzek, Julia	Sediment pore waters	Jacobs Univ./Univ. Bremen
20. Münch, Jessica.	Sediments	Jacobs Univ./Univ. Bremen
21. de Rezende, Carlos, Prof. Dr.	DOM and Hg	Universidade Estadual do Norte Fluminense
22. de Oliveira, Braulio	DOM and Hg	Universidade Estadual do Norte Fluminense
23. Marques, Jomar, Dr.	DOM and Hg	Universidade Estadual do Norte Fluminense
24. Walter, Juline Marta, Dr.	Microbiology	SAGE-COPPE
25. Soares Nobrega, Maria	Microbiology	SAGE-COPPE
26. de Carvalho, Leandro , Prof. Dr.	Onboard analyses of trace metals	Universidade Federal de Santa Maria
27. Schneider, Alexandre, Prof. Dr.	Onboard analyses of trace metals	Universidade Federal do Rio Grande do Sul
28. Maguire, Clive	Logistics support, public outreach	Jacobs Univ. (contractor)
29. Rohleder, Christian	Meteorology	DWD
30. Freire Peireira, Almir	Observer Brazil	Brazilian Navy

Participating Institutions:

Jacobs University Bremen
Department of Physics and Earth Sciences
Campus Ring 1
28759 Bremen/ Germany
https://www.jacobs-university.de/department/physics-earth-sciences

GEOMAR
Helmholtz Centre for Ocean Research Kiel,
Wischhofstraße 1-3
24148 Kiel/ Germany
www.geomar.de

University of Oldenburg
Institute for Chemistry and Biology of the Marine Environment (ICBM)
Carl-von-Ossietzky-Str. 9-11
26129 Oldenburg, Germany
https://www.icbm.de/en/

Christian Albrechts University (CAU) Kiel
Institute of Geosciences
Otto-Hahn-Platz 1
24118 Kiel/ Germany
www.ifg.uni-kiel.de/

University of Heidelberg
Institute of Environmental Physics
Im Neuenheimer Feld 229
69120 Heidelberg
http://www.iup.uni-heidelberg.de/en/

Universidade Federal de Santa Maria – UFSM,
Instituto de Química,
Campus Camobi
Santa Maria/RS 97111970, Brazil

Universidade Federal do Rio Grande do Sul
Instituto de Química,
Av. Bento Gonçalves, 9500
90650-001 Porto Alegre-RS, Brazil

Universidade Estadual do Norte Fluminense- UENF
Laboratório de Ciências Ambientais, Centro de Biociências e Biotecnologia
Av. Alberto Lamego 2000
Parque Califórnia
Campos dos Goytacazes, RJ 28.013-602, Brazil

Universidade Federal do Rio de Janeiro
Laboratório de Microbiologia, Instituto de Biologia
Av. Carlos Chagas Filho 373,
21941-599, Ilha do Fundão, Rio de Janeiro, RJ, Brazil

DWD **Deutscher Wetterdienst**
Seeschifffahrtsberatung
Bernhard-Nocht-Straße 76
20359 Hamburg / Germany
https://www.dwd.de/EN/

Station list

Station	Date / Time UTC	Device	Action	Latitude	Longitude
M147_1-1	04/23/18 11:30	Underway Water Sampling	in the water	16° 25,977' N	028° 47,427' W
M147_1-1	04/25/18 09:06	Underway Water Sampling	on deck	10° 07,155' N	036° 04,983' W
M147_2-1	04/25/18 09:22	CTD/TM	in the water	10° 07,161' N	036° 04,984' W
M147_2-1	04/25/18 09:40	CTD/TM	max depth/on ground	10° 07,186' N	036° 05,001' W
M147_2-1	04/25/18 09:54	CTD/TM	on deck	10° 07,199' N	036° 05,019' W
M147_3-1	04/25/18 15:08	CTD/TM	in the water	09° 29,982' N	036° 47,524' W
M147_3-1	04/25/18 15:28	CTD/TM	max depth/on ground	09° 30,083' N	036° 47,452' W
M147_3-1	04/25/18 15:41	CTD/TM	on deck	09° 30,125' N	036° 47,409' W
M147_4-1	04/26/18 10:07	CTD/TM	in the water	07° 18,995' N	039° 17,836' W
M147_4-1	04/26/18 10:35	CTD/TM	max depth/on ground	07° 19,123' N	039° 17,843' W
M147_4-1	04/26/18 11:00	CTD/TM	on deck	07° 19,278' N	039° 17,782' W
M147_5-1	04/26/18 16:02	CTD/TM	in the water	06° 42,423' N	040° 00,110' W
M147_5-1	04/26/18 16:28	CTD/TM	max depth/on ground	06° 42,475' N	040° 00,081' W
M147_5-1	04/26/18 16:52	CTD/TM	on deck	06° 42,501' N	040° 00,073' W
M147_6-1	04/27/18 11:30	CTD/TM	in the water	04° 09,510' N	042° 54,756' W
M147_6-1	04/27/18 11:45	CTD/TM	max depth/on ground	04° 09,548' N	042° 54,659' W
M147_6-1	04/27/18 11:58	CTD/TM	on deck	04° 09,588' N	042° 54,574' W
M147_7-1	04/29/18 21:50	Underway Water Sampling	in the water	00° 55,060' S	048° 27,189' W
M147_7-1	04/30/18 19:57	Underway Water Sampling	on deck	00° 31,348' N	047° 23,580' W
M147_7-1	04/30/18 19:57	Underway Water Sampling	in the water	00° 31,357' N	047° 23,578' W
M147_7-1	05/01/18 16:25	Underway Water Sampling	on deck	01° 55,048' N	046° 39,097' W
M147_7-1	05/01/18 16:28	Underway Water Sampling	in the water	01° 55,091' N	046° 39,271' W
M147_8-1	04/30/18 08:06	CTD	in the water	00° 10,462' S	047° 55,394' W
M147_8-1	04/30/18 08:10	CTD	max depth/on ground	00° 10,459' S	047° 55,403' W
M147_8-1	04/30/18 08:17	CTD	on deck	00° 10,456' S	047° 55,426' W
M147_9-1	04/30/18 08:44	CTD/TM	in the water	00° 10,495' S	047° 55,507' W
M147_9-1	04/30/18 08:54	CTD/TM	max depth/on ground	00° 10,534' S	047° 55,685' W
M147_9-1	04/30/18 09:00	CTD/TM	on deck	00° 10,567' S	047° 55,832' W
M147_10-1	04/30/18 09:32	CTD	information	00° 10,552' S	047° 55,720' W
M147_10-1	04/30/18 09:36	CTD	max depth/on ground	00° 10,576' S	047° 55,812' W
M147_10-1	04/30/18 09:42	CTD	on deck	00° 10,629' S	047° 55,930' W
M147_11-1	04/30/18 10:12	MUC	in the water	00° 10,208' S	047° 57,134' W
M147_11-1	04/30/18 10:15	MUC	max depth/on ground	00° 10,222' S	047° 57,176' W
M147_11-1	04/30/18 10:19	MUC	on deck	00° 10,236' S	047° 57,225' W
M147_12-1	04/30/18 15:06	Pump	in the water	00° 12,075' N	047° 37,791' W
M147_12-1	04/30/18 15:29	Pump	on deck	00° 13,066' N	047° 37,774' W
M147_13-1	04/30/18 17:59	CTD	in the water	00° 24,046' N	047° 28,350' W
M147_13-1	04/30/18 18:03	CTD	max depth/on ground	00° 24,032' N	047° 28,356' W
M147_13-1	04/30/18 18:09	CTD	on deck	00° 24,016' N	047° 28,341' W
M147_13-2	04/30/18 18:02	Pump	in the water	00° 24,035' N	047° 28,357' W
M147_13-2	04/30/18 18:32	Pump	on deck	00° 24,049' N	047° 28,012' W
M147_14-1	04/30/18 18:16	CTD/TM	in the water	00° 24,050' N	047° 28,265' W
M147_14-1	04/30/18 18:20	CTD/TM	max depth/on ground	00° 24,043' N	047° 28,161' W
M147_14-1	04/30/18 18:25	CTD/TM	on deck	00° 24,041' N	047° 28,078' W
M147_15-1	05/01/18 01:01	CTD	in the water	01° 01,508' N	047° 04,029' W

M147_15-1	05/01/18 01:05	CTD	max depth/on ground	01° 01,513' N	047° 04,037' W
M147_15-1	05/01/18 01:09	CTD	on deck	01° 01,517' N	047° 04,043' W
M147_15-2	05/01/18 01:01	Pump	in the water	01° 01,508' N	047° 04,030' W
M147_15-2	05/01/18 01:47	Pump	on deck	01° 01,572' N	047° 04,004' W
M147_16-1	05/01/18 01:21	CTD/TM	in the water	01° 01,553' N	047° 04,072' W
M147_16-1	05/01/18 01:28	CTD/TM	max depth/on ground	01° 01,605' N	047° 04,122' W
M147_16-1	05/01/18 01:34	CTD/TM	on deck	01° 01,644' N	047° 04,167' W
M147_17-1	05/01/18 01:57	MUC	in the water	01° 01,605' N	047° 04,007' W
M147_17-1	05/01/18 02:01	MUC	max depth/on ground	01° 01,612' N	047° 03,999' W
M147_17-1	05/01/18 02:05	MUC	on deck	01° 01,638' N	047° 04,001' W
M147_17-1	05/01/18 02:27	MUC	in the water	01° 01,536' N	047° 03,997' W
M147_17-1	05/01/18 02:30	MUC	max depth/on ground	01° 01,542' N	047° 04,011' W
M147_17-1	05/01/18 02:33	MUC	on deck	01° 01,546' N	047° 04,018' W
M147_18-1	05/01/18 09:34	CTD	in the water	01° 54,512' N	046° 26,375' W
M147_18-1	05/01/18 10:17	CTD	max depth/on ground	01° 54,878' N	046° 26,760' W
M147_18-1	05/01/18 10:59	CTD	on deck	01° 55,243' N	046° 27,079' W
M147_18-2	05/01/18 09:38	Pump	in the water	01° 54,566' N	046° 26,502' W
M147_18-2	05/01/18 10:35	Pump	on deck	01° 54,996' N	046° 26,854' W
M147_19-1	05/01/18 11:49	CTD	in the water	01° 54,549' N	046° 26,382' W
M147_19-1	05/01/18 12:10	CTD	max depth/on ground	01° 54,850' N	046° 26,763' W
M147_19-1	05/01/18 12:33	CTD	on deck	01° 55,067' N	046° 27,008' W
M147_20-1	05/01/18 13:15	CTD	in the water	01° 55,449' N	046° 28,824' W
M147_20-1	05/01/18 13:18	CTD	max depth/on ground	01° 55,465' N	046° 28,909' W
M147_20-1	05/01/18 13:23	CTD	on deck	01° 55,524' N	046° 29,045' W
M147_21-1	05/01/18 14:32	MUC	in the water	01° 54,435' N	046° 38,312' W
M147_21-1	05/01/18 15:14	MUC	max depth/on ground	01° 54,581' N	046° 38,424' W
M147_21-1	05/01/18 15:57	MUC	on deck	01° 54,581' N	046° 38,422' W
M147_22-1	05/02/18 08:51	CTD	in the water	01° 35,670' N	049° 00,160' W
M147_22-1	05/02/18 08:53	CTD	max depth/on ground	01° 35,658' N	049° 00,173' W
M147_22-1	05/02/18 08:57	CTD	on deck	01° 35,654' N	049° 00,193' W
M147_22-2	05/02/18 08:53	Pump	in the water	01° 35,659' N	049° 00,171' W
M147_22-2	05/02/18 09:09	Pump	on deck	01° 35,654' N	049° 00,198' W
M147_23-1	05/02/18 09:16	MUC	in the water	01° 35,652' N	049° 00,194' W
M147_23-1	05/02/18 09:18	MUC	max depth/on ground	01° 35,653' N	049° 00,195' W
M147_23-1	05/02/18 09:22	MUC	on deck	01° 35,652' N	049° 00,195' W
M147_24-1	05/02/18 17:13	MUC	in the water	00° 57,108' N	049° 38,864' W
M147_24-1	05/02/18 17:15	MUC	max depth/on ground	00° 57,108' N	049° 38,864' W
M147_24-1	05/02/18 17:20	MUC	on deck	00° 57,108' N	049° 38,864' W
M147_24-1	05/02/18 17:36	MUC	in the water	00° 57,107' N	049° 38,864' W
M147_24-1	05/02/18 17:37	MUC	max depth/on ground	00° 57,108' N	049° 38,864' W
M147_24-1	05/02/18 17:42	MUC	on deck	00° 57,108' N	049° 38,865' W
M147_25-1	05/02/18 17:58	CTD	in the water	00° 57,107' N	049° 38,864' W
M147_25-1	05/02/18 17:59	CTD	max depth/on ground	00° 57,107' N	049° 38,864' W
M147_25-1	05/02/18 18:19	CTD	on deck	00° 57,102' N	049° 38,852' W
M147_25-2	05/02/18 17:59	Pump	in the water	00° 57,107' N	049° 38,864' W
M147_25-2	05/02/18 18:24	Pump	on deck	00° 57,101' N	049° 38,851' W
M147_26-1	05/02/18 21:49	CTD	in the water	01° 26,721' N	049° 19,989' W
M147_26-1	05/02/18 21:49	CTD	max depth/on ground	01° 26,721' N	049° 19,989' W
M147_26-1	05/02/18 21:53	CTD	on deck	01° 26,708' N	049° 19,991' W

M147_27-1	05/02/18 22:18	CTD	in the water	01° 27,080' N	049° 19,006' W
M147_27-1	05/02/18 22:19	CTD	max depth/on ground	01° 27,076' N	049° 19,018' W
M147_27-1	05/02/18 22:20	CTD	on deck	01° 27,063' N	049° 19,049' W
M147_28-1	05/02/18 23:03	CTD	in the water	01° 26,269' N	049° 16,785' W
M147_28-1	05/02/18 23:04	CTD	max depth/on ground	01° 26,267' N	049° 16,821' W
M147_28-1	05/02/18 23:07	CTD	on deck	01° 26,263' N	049° 16,889' W
M147_28-2	05/02/18 23:04	Pump	in the water	01° 26,266' N	049° 16,830' W
M147_28-2	05/02/18 23:26	Pump	on deck	01° 26,343' N	049° 17,129' W
M147_29-1	05/02/18 23:35	CTD	in the water	01° 26,391' N	049° 17,101' W
M147_29-1	05/02/18 23:37	CTD	max depth/on ground	01° 26,370' N	049° 17,152' W
M147_29-1	05/02/18 23:40	CTD	on deck	01° 26,351' N	049° 17,281' W
M147_29-2	05/02/18 23:36	Pump	in the water	01° 26,375' N	049° 17,133' W
M147_29-2	05/03/18 00:03	Pump	on deck	01° 26,226' N	049° 17,761' W
M147_30-1	05/03/18 00:15	CTD	in the water	01° 26,295' N	049° 17,770' W
M147_30-1	05/03/18 00:16	CTD	max depth/on ground	01° 26,293' N	049° 17,787' W
M147_30-1	05/03/18 00:20	CTD	on deck	01° 26,239' N	049° 17,967' W
M147_30-2	05/03/18 00:17	Pump	in the water	01° 26,281' N	049° 17,834' W
M147_30-2	05/03/18 00:39	Pump	on deck	01° 25,871' N	049° 18,818' W
M147_31-1	05/03/18 01:28	CTD	in the water	01° 27,834' N	049° 15,274' W
M147_31-1	05/03/18 01:29	CTD	max depth/on ground	01° 27,805' N	049° 15,304' W
M147_31-1	05/03/18 01:34	CTD	on deck	01° 27,693' N	049° 15,425' W
M147_31-2	05/03/18 01:28	Pump	in the water	01° 27,829' N	049° 15,279' W
M147_31-2	05/03/18 01:40	Pump	on deck	01° 27,504' N	049° 15,582' W
M147_32-1	05/03/18 07:44	CTD	in the water	02° 18,100' N	048° 35,141' W
M147_32-1	05/03/18 07:44	CTD	max depth/on ground	02° 18,102' N	048° 35,143' W
M147_32-1	05/03/18 07:48	CTD	on deck	02° 18,116' N	048° 35,159' W
M147_32-2	05/03/18 07:44	Pump	in the water	02° 18,100' N	048° 35,142' W
M147_32-2	05/03/18 08:13	Pump	on deck	02° 18,159' N	048° 35,228' W
M147_33-1	05/03/18 09:31	CTD	in the water	02° 25,537' N	048° 30,248' W
M147_33-1	05/03/18 09:31	CTD	max depth/on ground	02° 25,540' N	048° 30,259' W
M147_33-1	05/03/18 09:35	CTD	on deck	02° 25,553' N	048° 30,330' W
M147_33-2	05/03/18 09:39	Pump	in the water	02° 25,573' N	048° 30,425' W
M147_33-2	05/03/18 10:02	Pump	on deck	02° 25,702' N	048° 30,960' W
M147_34-1	05/03/18 11:13	CTD	in the water	02° 32,953' N	048° 26,304' W
M147_34-1	05/03/18 11:15	CTD	max depth/on ground	02° 32,951' N	048° 26,371' W
M147_34-1	05/03/18 11:20	CTD	on deck	02° 32,938' N	048° 26,523' W
M147_34-2	05/03/18 11:22	Pump	in the water	02° 32,946' N	048° 26,604' W
M147_34-2	05/03/18 11:49	Pump	on deck	02° 32,888' N	048° 27,376' W
M147_35-1	05/03/18 14:35	CTD	in the water	02° 51,246' N	048° 15,518' W
M147_35-1	05/03/18 14:44	CTD	max depth/on ground	02° 51,448' N	048° 15,729' W
M147_35-1	05/03/18 14:52	CTD	on deck	02° 51,631' N	048° 15,825' W
M147_36-1	05/03/18 15:03	CTD/TM	in the water	02° 51,777' N	048° 16,310' W
M147_36-1	05/03/18 15:10	CTD/TM	max depth/on ground	02° 51,953' N	048° 16,451' W
M147_36-1	05/03/18 15:17	CTD/TM	on deck	02° 52,128' N	048° 16,579' W
M147_36-2	05/03/18 15:21	Pump	in the water	02° 52,228' N	048° 16,667' W
M147_36-2	05/03/18 15:48	Pump	on deck	02° 52,729' N	048° 17,605' W
M147_37-1	05/03/18 15:55	MUC	information	02° 52,836' N	048° 17,666' W
M147_37-1	05/03/18 15:59	MUC	max depth/on ground	02° 52,849' N	048° 17,665' W
M147_37-1	05/03/18 16:05	MUC	on deck	02° 52,855' N	048° 17,667' W

M147_38-1	05/04/18 01:19	CTD	in the water	03° 55,537' N	047° 36,554' W
M147_38-1	05/04/18 01:34	CTD	max depth/on ground	03° 55,683' N	047° 36,623' W
M147_38-1	05/04/18 01:51	CTD	on deck	03° 55,938' N	047° 36,536' W
M147_39-1	05/04/18 02:00	CTD/TM	in the water	03° 55,982' N	047° 36,600' W
M147_39-1	05/04/18 02:47	CTD/TM	max depth/on ground	03° 56,526' N	047° 36,588' W
M147_39-1	05/04/18 03:32	CTD/TM	on deck	03° 57,153' N	047° 36,104' W
M147_40-1	05/04/18 03:47	CTD	in the water	03° 57,166' N	047° 36,101' W
M147_40-1	05/04/18 04:25	CTD	max depth/on ground	03° 57,315' N	047° 36,189' W
M147_40-1	05/04/18 05:00	CTD	on deck	03° 57,501' N	047° 36,297' W
M147_41-1	05/04/18 05:24	MUC	in the water	03° 56,935' N	047° 36,313' W
M147_41-1	05/04/18 05:58	MUC	max depth/on ground	03° 56,933' N	047° 36,313' W
M147_41-1	05/04/18 06:33	MUC	on deck	03° 56,937' N	047° 36,311' W
M147_42-1	05/05/18 10:50	CTD	in the water	00° 38,009' S	046° 54,030' W
M147_42-1	05/05/18 10:51	CTD	max depth/on ground	00° 38,011' S	046° 54,033' W
M147_42-1	05/05/18 10:54	CTD	on deck	00° 38,003' S	046° 54,044' W
M147_42-2	05/05/18 10:56	Pump	in the water	00° 37,998' S	046° 54,060' W
M147_42-2	05/05/18 11:08	Pump	on deck	00° 38,082' S	046° 54,212' W
M147_43-1	05/05/18 13:24	CTD	in the water	00° 35,722' S	046° 46,164' W
M147_43-1	05/05/18 13:24	CTD	max depth/on ground	00° 35,720' S	046° 46,171' W
M147_43-1	05/05/18 13:28	CTD	on deck	00° 35,700' S	046° 46,234' W
M147_43-2	05/05/18 13:30	Pump	in the water	00° 35,699' S	046° 46,292' W
M147_43-2	05/05/18 13:40	Pump	on deck	00° 35,685' S	046° 46,558' W
M147_44-1	05/05/18 14:41	CTD	in the water	00° 35,873' S	046° 54,151' W
M147_44-1	05/05/18 14:43	CTD	max depth/on ground	00° 35,857' S	046° 54,179' W
M147_44-1	05/05/18 14:44	CTD	at surface	00° 35,842' S	046° 54,205' W
M147_44-1	05/05/18 14:46	CTD	max depth/on ground	00° 35,829' S	046° 54,237' W
M147_44-1	05/05/18 14:49	CTD	on deck	00° 35,799' S	046° 54,298' W
M147_44-2	05/05/18 14:51	Pump	in the water	00° 35,774' S	046° 54,343' W
M147_44-2	05/05/18 14:59	Pump	on deck	00° 35,704' S	046° 54,499' W
M147_45-1	05/05/18 16:09	CTD	in the water	00° 32,720' S	046° 46,145' W
M147_45-1	05/05/18 16:13	CTD	max depth/on ground	00° 32,664' S	046° 46,158' W
M147_45-1	05/05/18 16:17	CTD	on deck	00° 32,631' S	046° 46,189' W
M147_45-2	05/05/18 16:20	Pump	in the water	00° 32,613' S	046° 46,219' W
M147_45-2	05/05/18 16:28	Pump	on deck	00° 32,573' S	046° 46,336' W
M147_46-1	05/05/18 17:37	CTD	information	00° 32,682' S	046° 54,003' W
M147_46-1	05/05/18 17:41	CTD	max depth/on ground	00° 32,661' S	046° 53,999' W
M147_46-1	05/05/18 17:44	CTD	on deck	00° 32,647' S	046° 53,997' W
M147_46-2	05/05/18 17:46	Pump	in the water	00° 32,640' S	046° 53,994' W
M147_47-1	05/05/18 19:02	CTD	in the water	00° 28,770' S	046° 46,105' W
M147_47-1	05/05/18 19:06	CTD	max depth/on ground	00° 28,794' S	046° 46,087' W
M147_47-1	05/05/18 19:10	CTD	on deck	00° 28,807' S	046° 46,093' W
M147_47-2	05/05/18 19:12	Pump	in the water	00° 28,811' S	046° 46,095' W
M147_47-2	05/05/18 19:20	Pump	on deck	00° 28,857' S	046° 46,139' W
M147_48-1	05/05/18 20:00	Underway Water Sampling	station start	00° 30,224' S	046° 40,918' W
M147_49-1	05/06/18 14:59	CTD	in the water	00° 38,744' S	046° 46,181' W
M147_49-1	05/06/18 15:03	CTD	max depth/on ground	00° 38,716' S	046° 46,256' W
M147_49-1	05/06/18 15:06	CTD	on deck	00° 38,697' S	046° 46,304' W
M147_49-2	05/06/18 15:11	Pump	in the water	00° 38,676' S	046° 46,347' W
M147_49-2	05/06/18 15:18	Pump	on deck	00° 38,641' S	046° 46,405' W

M147_50-1	05/06/18 15:31	MUC	in the water	00° 38,645' S	046° 46,436' W
M147_50-1	05/06/18 15:32	MUC	max depth/on ground	00° 38,644' S	046° 46,438' W
M147_50-1	05/06/18 15:36	MUC	on deck	00° 38,641' S	046° 46,436' W
M147_51-1	05/06/18 17:00	CTD	in the water	00° 28,962' S	046° 54,033' W
M147_51-1	05/06/18 17:04	CTD	max depth/on ground	00° 28,956' S	046° 54,032' W
M147_51-1	05/06/18 17:09	CTD	on deck	00° 28,958' S	046° 54,056' W
M147_51-2	05/06/18 17:10	Pump	in the water	00° 28,959' S	046° 54,064' W
M147_51-2	05/06/18 17:20	Pump	on deck	00° 28,959' S	046° 54,159' W
M147_52-1	05/06/18 18:42	CTD	in the water	00° 20,777' S	046° 46,108' W
M147_52-1	05/06/18 18:47	CTD	max depth/on ground	00° 20,782' S	046° 46,111' W
M147_52-1	05/06/18 18:50	CTD	on deck	00° 20,785' S	046° 46,119' W
M147_52-2	05/06/18 18:52	Pump	in the water	00° 20,786' S	046° 46,123' W
M147_52-2	05/06/18 19:05	Pump	on deck	00° 20,785' S	046° 46,160' W
M147_53-1	05/06/18 20:06	CTD	in the water	00° 21,023' S	046° 54,004' W
M147_53-1	05/06/18 20:10	CTD	max depth/on ground	00° 21,037' S	046° 54,027' W
M147_53-1	05/06/18 20:19	CTD	on deck	00° 21,048' S	046° 54,059' W
M147_53-2	05/06/18 20:22	Pump	in the water	00° 21,058' S	046° 54,066' W
M147_53-2	05/06/18 20:34	Pump	on deck	00° 21,130' S	046° 54,090' W
M147_54-1	05/06/18 22:34	CTD	in the water	00° 04,784' S	046° 46,159' W
M147_54-1	05/06/18 22:39	CTD	max depth/on ground	00° 04,829' S	046° 46,217' W
M147_54-1	05/06/18 22:44	CTD	on deck	00° 04,897' S	046° 46,317' W
M147_54-2	05/06/18 22:47	Pump	in the water	00° 04,951' S	046° 46,395' W
M147_54-2	05/06/18 23:01	Pump	on deck	00° 05,164' S	046° 46,440' W
M147_55-1	05/07/18 00:02	CTD	in the water	00° 05,001' S	046° 54,055' W
M147_55-1	05/07/18 00:06	CTD	max depth/on ground	00° 05,014' S	046° 54,111' W
M147_55-1	05/07/18 00:12	CTD	on deck	00° 05,061' S	046° 54,223' W
M147_55-2	05/07/18 00:13	Pump	in the water	00° 05,074' S	046° 54,256' W
M147_55-2	05/07/18 00:27	Pump	on deck	00° 05,206' S	046° 54,551' W
M147_56-1	05/07/18 03:30	Underway Water Sampling	station start	00° 37,538' S	046° 54,016' W
M147_56-1	05/07/18 12:14	Underway Water Sampling	station end	00° 28,351' S	046° 53,923' W
M147_56-2	05/07/18 07:53	Pump	in the water	00° 18,971' S	047° 32,976' W
M147_56-2	05/07/18 08:07	Pump	on deck	00° 18,890' S	047° 32,889' W
M147_57-1	05/07/18 12:14	Underway Water Sampling	station start	00° 28,293' S	046° 53,895' W
M147_57-1	05/09/18 11:31	Underway Water Sampling	on deck	00° 03,287' N	048° 42,447' W
M147_57-1	05/09/18 22:15	Underway Water Sampling	in the water	00° 01,054' N	048° 24,976' W
M147_57-1	05/10/18 00:38	Underway Water Sampling	on deck	00° 01,770' N	048° 11,280' W
M147_57-1	05/11/18 00:14	Underway Water Sampling	in the water	00° 34,067' N	047° 59,838' W
M147_57-1	05/13/18 13:14	Underway Water Sampling	on deck	05° 30,798' N	051° 36,018' W
M147_57-1	05/13/18 14:04	Underway Water Sampling	in the water	05° 36,632' N	051° 38,059' W
M147_57-1	05/19/18 07:00	Underway Water Sampling	on deck	00° 14,448' N	048° 00,583' W
M147_58-1	05/08/18 11:56	CTD	in the water	02° 19,184' N	047° 27,388' W
M147_58-1	05/08/18 12:18	CTD	max depth/on ground	02° 19,446' N	047° 28,277' W
M147_58-1	05/08/18 12:45	CTD	on deck	02° 19,753' N	047° 29,024' W
M147_59-1	05/08/18 13:26	CTD/TM	in the water	02° 20,611' N	047° 25,748' W
M147_59-1	05/08/18 13:50	CTD/TM	max depth/on ground	02° 20,469' N	047° 26,022' W
M147_59-1	05/08/18 14:14	CTD/TM	on deck	02° 20,111' N	047° 26,757' W
M147_59-2	05/08/18 14:16	Pump	in the water	02° 20,096' N	047° 26,843' W
M147_59-2	05/08/18 14:43	Pump	on deck	02° 19,992' N	047° 28,066' W
M147_60-1	05/08/18 15:02	MUC	in the water	02° 20,174' N	047° 27,472' W

M147_60-1	05/08/18 15:22	MUC	max depth/on ground	02° 20,224' N	047° 27,493' W
M147_60-1	05/08/18 15:42	MUC	on deck	02° 20,224' N	047° 27,492' W
M147_60-1	05/08/18 15:58	MUC	in the water	02° 20,225' N	047° 27,491' W
M147_60-1	05/08/18 16:17	MUC	max depth/on ground	02° 20,223' N	047° 27,493' W
M147_60-1	05/08/18 16:38	MUC	on deck	02° 20,231' N	047° 27,492' W
M147_61-1	05/08/18 18:58	CTD	in the water	02° 05,073' N	047° 39,683' W
M147_61-1	05/08/18 19:03	CTD	max depth/on ground	02° 05,124' N	047° 39,746' W
M147_61-1	05/08/18 19:10	CTD	on deck	02° 05,172' N	047° 39,857' W
M147_62-1	05/08/18 19:14	CTD/TM	in the water	02° 05,214' N	047° 39,924' W
M147_62-1	05/08/18 19:19	CTD/TM	max depth/on ground	02° 05,309' N	047° 39,934' W
M147_62-1	05/08/18 19:26	CTD/TM	on deck	02° 05,423' N	047° 39,999' W
M147_62-2	05/08/18 19:31	Pump	in the water	02° 05,463' N	047° 40,050' W
M147_62-2	05/08/18 19:44	Pump	on deck	02° 05,464' N	047° 40,075' W
M147_63-1	05/08/18 19:49	MUC	in the water	02° 05,463' N	047° 40,075' W
M147_63-1	05/08/18 19:53	MUC	max depth/on ground	02° 05,466' N	047° 40,075' W
M147_63-1	05/08/18 19:58	MUC	on deck	02° 05,474' N	047° 40,075' W
M147_63-1	05/08/18 20:15	MUC	in the water	02° 05,473' N	047° 40,075' W
M147_63-1	05/08/18 20:19	MUC	max depth/on ground	02° 05,476' N	047° 40,075' W
M147_63-1	05/08/18 20:24	MUC	on deck	02° 05,484' N	047° 40,075' W
M147_64-1	05/08/18 21:47	CTD	in the water	01° 56,464' N	047° 47,247' W
M147_64-1	05/08/18 21:52	CTD	max depth/on ground	01° 56,566' N	047° 47,294' W
M147_64-1	05/08/18 21:58	CTD	on deck	01° 56,676' N	047° 47,348' W
M147_64-2	05/08/18 22:01	Pump	in the water	01° 56,686' N	047° 47,357' W
M147_64-2	05/08/18 22:16	Pump	on deck	01° 56,798' N	047° 47,407' W
M147_65-1	05/09/18 11:03	MUC	in the water	00° 03,240' N	048° 42,492' W
M147_65-1	05/09/18 11:05	MUC	max depth/on ground	00° 03,241' N	048° 42,489' W
M147_65-1	05/09/18 11:08	MUC	on deck	00° 03,243' N	048° 42,485' W
M147_66-1	05/09/18 11:16	CTD	in the water	00° 03,258' N	048° 42,479' W
M147_66-1	05/09/18 11:23	CTD	on deck	00° 03,271' N	048° 42,464' W
M147_66-2	05/09/18 11:27	Pump	in the water	00° 03,276' N	048° 42,443' W
M147_66-2	05/09/18 11:40	Pump	on deck	00° 03,292' N	048° 42,417' W
M147_67-1	05/09/18 11:46	MUC	in the water	00° 03,289' N	048° 42,375' W
M147_67-1	05/09/18 11:50	MUC	max depth/on ground	00° 03,288' N	048° 42,367' W
M147_67-1	05/09/18 11:56	MUC	on deck	00° 03,289' N	048° 42,355' W
M147_68-1	05/09/18 12:49	CTD	in the water	00° 03,945' S	048° 41,421' W
M147_68-1	05/09/18 12:50	CTD	max depth/on ground	00° 03,947' S	048° 41,417' W
M147_68-1	05/09/18 12:53	CTD	on deck	00° 03,951' S	048° 41,392' W
M147_68-2	05/09/18 12:55	Pump	in the water	00° 03,954' S	048° 41,376' W
M147_68-2	05/09/18 13:07	Pump	on deck	00° 03,976' S	048° 41,231' W
M147_69-1	05/09/18 21:54	CTD	in the water	00° 01,069' N	048° 25,126' W
M147_69-1	05/09/18 21:55	CTD	max depth/on ground	00° 01,069' N	048° 25,124' W
M147_69-1	05/09/18 21:57	CTD	on deck	00° 01,072' N	048° 25,099' W
M147_69-2	05/09/18 22:00	Pump	in the water	00° 01,073' N	048° 25,071' W
M147_69-2	05/09/18 22:13	Pump	on deck	00° 01,052' N	048° 24,988' W
M147_70-1	05/09/18 22:32	CTD	in the water	00° 01,203' N	048° 25,023' W
M147_70-1	05/09/18 22:32	CTD	max depth/on ground	00° 01,204' N	048° 25,021' W
M147_70-1	05/09/18 23:15	CTD	on deck	00° 01,404' N	048° 21,192' W
M147_71-1	05/10/18 00:00	CTD	in the water	00° 01,930' N	048° 13,226' W
M147_71-1	05/10/18 00:21	CTD	on deck	00° 01,717' N	048° 11,606' W

M147_71-1	05/10/18 00:37	CTD	information	00° 01,766' N	048° 11,293' W
M147_71-2	05/10/18 00:23	Pump	in the water	00° 01,717' N	048° 11,552' W
M147_71-2	05/10/18 00:28	Pump	on deck	00° 01,718' N	048° 11,468' W
M147_72-1	05/10/18 23:11	CTD	in the water	00° 33,935' N	047° 59,795' W
M147_72-1	05/10/18 23:22	CTD	max depth/on ground	00° 34,044' N	047° 59,900' W
M147_72-1	05/10/18 23:26	CTD	on deck	00° 34,064' N	047° 59,893' W
M147_72-1	05/10/18 23:41	CTD	information	00° 34,172' N	047° 59,641' W
M147_72-2	05/10/18 23:31	Pump	in the water	00° 34,077' N	047° 59,847' W
M147_72-2	05/10/18 23:32	Pump	on deck	00° 34,082' N	047° 59,827' W
M147_72-2	05/10/18 23:41	Pump	information	00° 34,170' N	047° 59,646' W
M147_73-1	05/10/18 23:48	MUC	in the water	00° 34,199' N	047° 59,477' W
M147_73-1	05/11/18 00:04	MUC	max depth/on ground	00° 34,055' N	047° 59,860' W
M147_73-1	05/11/18 00:07	MUC	on deck	00° 34,066' N	047° 59,858' W
M147_74-1	05/11/18 09:04	CTD	in the water	01° 44,141' N	047° 58,333' W
M147_74-1	05/11/18 09:08	CTD	max depth/on ground	01° 44,184' N	047° 58,366' W
M147_74-1	05/11/18 09:13	CTD	on deck	01° 44,232' N	047° 58,394' W
M147_74-2	05/11/18 09:15	Pump	in the water	01° 44,247' N	047° 58,397' W
M147_74-2	05/11/18 09:24	Pump	on deck	01° 44,358' N	047° 58,390' W
M147_75-1	05/11/18 10:36	CTD	in the water	01° 39,038' N	048° 02,419' W
M147_75-1	05/11/18 10:40	CTD	max depth/on ground	01° 39,079' N	048° 02,404' W
M147_75-1	05/11/18 10:47	CTD	on deck	01° 39,150' N	048° 02,352' W
M147_75-2	05/11/18 10:48	Pump	in the water	01° 39,155' N	048° 02,346' W
M147_75-2	05/11/18 10:56	Pump	on deck	01° 39,227' N	048° 02,286' W
M147_76-1	05/11/18 10:57	CTD/TM	in the water	01° 39,214' N	048° 02,279' W
M147_76-1	05/11/18 11:02	CTD/TM	on deck	01° 39,263' N	048° 02,276' W
M147_76-1	05/11/18 11:12	CTD/TM	information	01° 39,358' N	048° 02,245' W
M147_77-1	05/11/18 11:13	MUC	information	01° 39,364' N	048° 02,242' W
M147_77-1	05/11/18 11:20	MUC	max depth/on ground	01° 39,419' N	048° 02,230' W
M147_77-1	05/11/18 11:23	MUC	on deck	01° 39,446' N	048° 02,222' W
M147_77-1	05/11/18 11:26	MUC	information	01° 39,444' N	048° 02,211' W
M147_78-1	05/11/18 12:22	CTD	in the water	01° 34,989' N	048° 05,031' W
M147_78-1	05/11/18 12:43	CTD	max depth/on ground	01° 33,962' N	048° 05,685' W
M147_78-1	05/11/18 12:50	CTD	on deck	01° 34,043' N	048° 05,654' W
M147_78-1	05/11/18 13:08	CTD	information	01° 34,182' N	048° 05,604' W
M147_78-2	05/11/18 12:54	Pump	in the water	01° 34,080' N	048° 05,640' W
M147_78-2	05/11/18 13:08	Pump	on deck	01° 34,181' N	048° 05,605' W
M147_79-1	05/11/18 14:05	CTD	in the water	01° 28,754' N	048° 08,914' W
M147_79-1	05/11/18 14:12	CTD	max depth/on ground	01° 28,769' N	048° 08,913' W
M147_79-1	05/11/18 14:15	CTD	on deck	01° 28,773' N	048° 08,907' W
M147_79-1	05/11/18 14:29	CTD	information	01° 28,759' N	048° 08,892' W
M147_79-2	05/11/18 14:16	Pump	in the water	01° 28,774' N	048° 08,905' W
M147_79-2	05/11/18 14:25	Pump	on deck	01° 28,772' N	048° 08,892' W
M147_79-2	05/11/18 14:29	Pump	information	01° 28,759' N	048° 08,892' W
M147_80-1	05/11/18 16:16	CTD	in the water	01° 15,977' N	048° 16,730' W
M147_80-1	05/11/18 16:19	CTD	max depth/on ground	01° 15,996' N	048° 16,715' W
M147_80-1	05/11/18 16:23	CTD	on deck	01° 16,008' N	048° 16,703' W
M147_80-2	05/11/18 16:27	Pump	in the water	01° 16,013' N	048° 16,708' W
M147_80-2	05/11/18 16:40	Pump	on deck	01° 15,963' N	048° 16,735' W
M147_81-1	05/11/18 17:36	CTD	in the water	01° 09,975' N	048° 20,040' W

M147_81-1	05/11/18 17:40	CTD	max depth/on ground	01° 09,947' N	048° 20,089' W
M147_81-1	05/11/18 17:44	CTD	on deck	01° 09,922' N	048° 20,158' W
M147_81-2	05/11/18 17:46	Pump	in the water	01° 09,917' N	048° 20,166' W
M147_81-2	05/11/18 17:54	Pump	on deck	01° 09,896' N	048° 20,231' W
M147_82-1	05/11/18 18:00	MUC	in the water	01° 09,926' N	048° 20,257' W
M147_82-1	05/11/18 18:02	MUC	max depth/on ground	01° 09,922' N	048° 20,256' W
M147_82-1	05/11/18 18:06	MUC	on deck	01° 09,919' N	048° 20,258' W
M147_82-1	05/11/18 18:35	MUC	in the water	01° 09,986' N	048° 20,037' W
M147_82-1	05/11/18 18:39	MUC	max depth/on ground	01° 09,992' N	048° 20,030' W
M147_82-1	05/11/18 18:41	MUC	on deck	01° 09,988' N	048° 20,034' W
M147_82-1	05/11/18 19:10	MUC	in the water	01° 10,040' N	048° 20,062' W
M147_82-1	05/11/18 19:12	MUC	max depth/on ground	01° 10,042' N	048° 20,062' W
M147_82-1	05/11/18 19:15	MUC	on deck	01° 10,041' N	048° 20,062' W
M147_82-1	05/11/18 19:24	MUC	in the water	01° 10,043' N	048° 20,073' W
M147_82-1	05/11/18 19:26	MUC	max depth/on ground	01° 10,043' N	048° 20,078' W
M147_82-1	05/11/18 19:29	MUC	on deck	01° 10,045' N	048° 20,089' W
M147_83-1	05/11/18 22:56	CTD	information	01° 38,021' N	048° 35,175' W
M147_83-1	05/11/18 23:00	CTD	max depth/on ground	01° 38,023' N	048° 35,175' W
M147_83-1	05/11/18 23:03	CTD	on deck	01° 38,024' N	048° 35,176' W
M147_83-1	05/11/18 23:13	CTD	information	01° 38,016' N	048° 35,130' W
M147_83-2	05/11/18 23:05	Pump	in the water	01° 38,025' N	048° 35,175' W
M147_83-2	05/11/18 23:13	Pump	on deck	01° 38,016' N	048° 35,131' W
M147_84-1	05/12/18 02:29	CTD	in the water	02° 03,070' N	048° 49,947' W
M147_84-1	05/12/18 02:33	CTD	max depth/on ground	02° 03,103' N	048° 49,929' W
M147_84-1	05/12/18 02:36	CTD	on deck	02° 03,115' N	048° 49,903' W
M147_84-2	05/12/18 02:40	Pump	in the water	02° 03,111' N	048° 49,906' W
M147_84-2	05/12/18 02:48	Pump	on deck	02° 03,172' N	048° 49,982' W
M147_85-1	05/12/18 03:09	MUC	in the water	02° 03,053' N	048° 49,930' W
M147_85-1	05/12/18 03:13	MUC	max depth/on ground	02° 03,053' N	048° 49,926' W
M147_85-1	05/12/18 03:15	MUC	on deck	02° 03,050' N	048° 49,905' W
M147_86-1	05/12/18 07:37	CTD	in the water	02° 40,035' N	049° 12,091' W
M147_86-1	05/12/18 07:41	CTD	max depth/on ground	02° 40,050' N	049° 12,156' W
M147_86-1	05/12/18 07:47	CTD	on deck	02° 40,065' N	049° 12,263' W
M147_86-2	05/12/18 07:50	Pump	in the water	02° 40,076' N	049° 12,345' W
M147_86-2	05/12/18 07:59	Pump	on deck	02° 40,120' N	049° 12,571' W
M147_87-1	05/12/18 13:22	CTD	in the water	02° 39,049' N	050° 06,536' W
M147_87-1	05/12/18 13:27	CTD	max depth/on ground	02° 39,226' N	050° 06,476' W
M147_87-1	05/12/18 13:27	CTD	on deck	02° 39,233' N	050° 06,473' W
M147_87-2	05/12/18 13:29	Pump	in the water	02° 39,318' N	050° 06,435' W
M147_87-2	05/12/18 13:49	Pump	on deck	02° 40,098' N	050° 06,110' W
M147_88-1	05/12/18 17:04	CTD	information	03° 06,106' N	050° 29,971' W
M147_88-1	05/12/18 17:08	CTD	max depth/on ground	03° 06,020' N	050° 30,075' W
M147_88-1	05/12/18 17:11	CTD	on deck	03° 05,919' N	050° 30,190' W
M147_88-2	05/12/18 17:11	Pump	in the water	03° 05,916' N	050° 30,193' W
M147_88-2	05/12/18 17:22	Pump	on deck	03° 05,599' N	050° 30,543' W
M147_89-1	05/12/18 17:35	MUC	in the water	03° 05,661' N	050° 30,458' W
M147_89-1	05/12/18 17:39	MUC	max depth/on ground	03° 05,657' N	050° 30,464' W
M147_89-1	05/12/18 17:42	MUC	on deck	03° 05,653' N	050° 30,479' W
M147_90-1	05/12/18 22:06	CTD	in the water	03° 46,037' N	050° 48,019' W

M147_90-1	05/12/18 22:10	CTD	max depth/on ground	03° 46,093' N	050° 48,013' W
M147_90-1	05/12/18 22:15	CTD	on deck	03° 46,159' N	050° 48,000' W
M147_90-2	05/12/18 22:15	Pump	in the water	03° 46,161' N	050° 47,999' W
M147_90-2	05/12/18 22:22	Pump	on deck	03° 46,254' N	050° 47,973' W
M147_91-1	05/13/18 01:19	CTD	in the water	04° 18,025' N	051° 00,137' W
M147_91-1	05/13/18 01:23	CTD	max depth/on ground	04° 18,073' N	051° 00,216' W
M147_91-1	05/13/18 01:26	CTD	on deck	04° 18,107' N	051° 00,284' W
M147_91-2	05/13/18 01:27	Pump	in the water	04° 18,118' N	051° 00,305' W
M147_91-2	05/13/18 01:34	Pump	on deck	04° 18,202' N	051° 00,466' W
M147_92-1	05/13/18 04:25	CTD	in the water	04° 43,205' N	051° 22,502' W
M147_92-1	05/13/18 04:29	CTD	max depth/on ground	04° 43,309' N	051° 22,712' W
M147_92-1	05/13/18 04:35	CTD	on deck	04° 43,405' N	051° 22,983' W
M147_92-2	05/13/18 04:36	Pump	in the water	04° 43,426' N	051° 23,045' W
M147_92-2	05/13/18 04:44	Pump	on deck	04° 43,592' N	051° 23,486' W
M147_93-1	05/13/18 05:10	MUC	in the water	04° 43,133' N	051° 22,503' W
M147_93-1	05/13/18 05:12	MUC	max depth/on ground	04° 43,135' N	051° 22,498' W
M147_93-1	05/13/18 05:17	MUC	on deck	04° 43,138' N	051° 22,496' W
M147_93-1	05/13/18 05:35	MUC	in the water	04° 43,149' N	051° 22,515' W
M147_93-1	05/13/18 05:37	MUC	max depth/on ground	04° 43,150' N	051° 22,514' W
M147_93-1	05/13/18 05:42	MUC	on deck	04° 43,149' N	051° 22,513' W
M147_94-1	05/13/18 09:05	CTD	in the water	05° 04,937' N	051° 03,566' W
M147_94-1	05/13/18 09:13	CTD	max depth/on ground	05° 05,119' N	051° 03,850' W
M147_94-1	05/13/18 09:19	CTD	on deck	05° 05,261' N	051° 04,001' W
M147_95-1	05/13/18 09:30	CTD/TM	in the water	05° 05,750' N	051° 04,242' W
M147_95-1	05/13/18 09:35	CTD/TM	max depth/on ground	05° 05,927' N	051° 04,320' W
M147_95-1	05/13/18 09:43	CTD/TM	on deck	05° 06,195' N	051° 04,426' W
M147_95-2	05/13/18 09:46	Pump	in the water	05° 06,313' N	051° 04,502' W
M147_95-2	05/13/18 09:55	Pump	on deck	05° 06,617' N	051° 04,705' W
M147_96-1	05/13/18 12:56	CTD	in the water	05° 30,219' N	051° 35,124' W
M147_96-1	05/13/18 13:01	CTD	max depth/on ground	05° 30,375' N	051° 35,340' W
M147_96-1	05/13/18 13:06	CTD	on deck	05° 30,523' N	051° 35,609' W
M147_97-1	05/13/18 16:58	CTD	in the water	05° 59,339' N	051° 48,555' W
M147_97-1	05/13/18 17:04	CTD	max depth/on ground	05° 59,488' N	051° 48,775' W
M147_97-1	05/13/18 17:10	CTD	on deck	05° 59,656' N	051° 48,997' W
M147_98-1	05/13/18 17:18	CTD/TM	in the water	05° 59,884' N	051° 49,318' W
M147_98-1	05/13/18 17:31	CTD/TM	on deck	06° 00,185' N	051° 49,687' W
M147_99-1	05/13/18 17:58	MUC	in the water	06° 00,039' N	051° 49,195' W
M147_99-1	05/13/18 18:01	MUC	max depth/on ground	06° 00,047' N	051° 49,210' W
M147_99-1	05/13/18 18:08	MUC	on deck	06° 00,099' N	051° 49,235' W
M147_99-1	05/13/18 18:27	MUC	in the water	06° 00,265' N	051° 49,383' W
M147_99-1	05/13/18 18:30	MUC	max depth/on ground	06° 00,281' N	051° 49,413' W
M147_99-1	05/13/18 18:35	MUC	on deck	06° 00,346' N	051° 49,549' W
M147_99-1	05/13/18 19:22	MUC	in the water	06° 00,182' N	051° 49,203' W
M147_99-1	05/13/18 19:28	MUC	max depth/on ground	06° 00,264' N	051° 49,350' W
M147_99-1	05/13/18 19:36	MUC	on deck	06° 00,381' N	051° 49,457' W
M147_100-1	05/14/18 01:24	CTD	in the water	06° 19,091' N	051° 12,256' W
M147_100-1	05/14/18 01:31	CTD	max depth/on ground	06° 19,100' N	051° 12,473' W
M147_100-1	05/14/18 01:37	CTD	on deck	06° 19,105' N	051° 12,613' W
M147_100-2	05/14/18 01:38	Pump	in the water	06° 19,119' N	051° 12,609' W

M147_100-2	05/14/18 01:57	Pump	on deck	06° 19,101' N	051° 13,354' W
M147_101-1	05/14/18 12:32	CTD	in the water	06° 35,068' N	049° 46,576' W
M147_101-1	05/14/18 13:19	CTD	max depth/on ground	06° 34,998' N	049° 46,644' W
M147_101-1	05/14/18 14:11	CTD	on deck	06° 34,938' N	049° 46,867' W
M147_102-1	05/14/18 15:38	GO-FLO	in the water	06° 34,939' N	049° 46,865' W
M147_102-1	05/14/18 15:58	GO-FLO	max depth/on ground	06° 34,939' N	049° 46,867' W
M147_102-1	05/14/18 16:21	GO-FLO	on deck	06° 34,938' N	049° 46,865' W
M147_103-2	05/15/18 12:23	Pump	in the water	04° 27,157' N	050° 41,900' W
M147_103-2	05/15/18 12:30	Pump	on deck	04° 27,206' N	050° 41,937' W
M147_103-1	05/15/18 12:26	CTD	in the water	04° 27,137' N	050° 41,918' W
M147_103-1	05/15/18 12:28	CTD	max depth/on ground	04° 27,155' N	050° 41,922' W
M147_103-1	05/15/18 12:28	CTD	on deck	04° 27,165' N	050° 41,924' W
M147_104-1	05/15/18 12:47	GO-FLO	in the water	04° 27,286' N	050° 42,012' W
M147_104-1	05/15/18 12:50	GO-FLO	max depth/on ground	04° 27,312' N	050° 42,033' W
M147_104-1	05/15/18 12:55	GO-FLO	on deck	04° 27,407' N	050° 42,075' W
M147_105-1	05/15/18 17:08	CTD	in the water	03° 53,931' N	050° 30,026' W
M147_105-1	05/15/18 17:12	CTD	max depth/on ground	03° 53,956' N	050° 30,082' W
M147_105-1	05/15/18 17:18	CTD	on deck	03° 54,000' N	050° 30,172' W
M147_105-2	05/15/18 17:19	Pump	in the water	03° 54,015' N	050° 30,202' W
M147_105-2	05/15/18 17:27	Pump	on deck	03° 54,083' N	050° 30,350' W
M147_106-1	05/15/18 20:58	CTD	in the water	03° 32,984' N	050° 07,041' W
M147_106-1	05/15/18 21:03	CTD	max depth/on ground	03° 32,993' N	050° 07,095' W
M147_106-1	05/15/18 21:09	CTD	on deck	03° 33,015' N	050° 07,183' W
M147_106-2	05/15/18 21:11	Pump	in the water	03° 33,023' N	050° 07,211' W
M147_106-2	05/15/18 21:19	Pump	on deck	03° 33,074' N	050° 07,347' W
M147_107-1	05/15/18 21:26	GO-FLO	in the water	03° 33,118' N	050° 07,477' W
M147_107-1	05/15/18 21:28	GO-FLO	max depth/on ground	03° 33,125' N	050° 07,512' W
M147_107-1	05/15/18 21:34	GO-FLO	on deck	03° 33,152' N	050° 07,609' W
M147_108-1	05/15/18 21:48	MUC	in the water	03° 33,042' N	050° 07,245' W
M147_108-1	05/15/18 21:52	MUC	max depth/on ground	03° 33,051' N	050° 07,247' W
M147_108-1	05/15/18 21:55	MUC	on deck	03° 33,069' N	050° 07,278' W
M147_109-1	05/16/18 00:00	CTD	in the water	03° 18,144' N	050° 17,857' W
M147_109-1	05/16/18 00:10	CTD	max depth/on ground	03° 18,437' N	050° 17,754' W
M147_109-1	05/16/18 00:11	CTD	on deck	03° 18,472' N	050° 17,742' W
M147_109-2	05/16/18 00:12	Pump	in the water	03° 18,491' N	050° 17,736' W
M147_109-2	05/16/18 00:18	Pump	on deck	03° 18,686' N	050° 17,665' W
M147_110-1	05/16/18 04:39	CTD	in the water	02° 54,066' N	049° 51,925' W
M147_110-1	05/16/18 04:43	CTD	max depth/on ground	02° 54,157' N	049° 51,915' W
M147_110-1	05/16/18 04:47	CTD	on deck	02° 54,223' N	049° 51,926' W
M147_110-2	05/16/18 04:48	Pump	in the water	02° 54,237' N	049° 51,920' W
M147_110-2	05/16/18 04:57	Pump	on deck	02° 54,390' N	049° 51,995' W
M147_111-1	05/16/18 07:23	CTD	in the water	03° 07,984' N	049° 40,094' W
M147_111-1	05/16/18 07:27	CTD	max depth/on ground	03° 07,975' N	049° 40,211' W
M147_111-1	05/16/18 07:31	CTD	on deck	03° 07,959' N	049° 40,370' W
M147_111-2	05/16/18 07:36	Pump	information	03° 07,943' N	049° 40,559' W
M147_111-2	05/16/18 07:41	Pump	on deck	03° 07,923' N	049° 40,773' W
M147_112-1	05/16/18 07:44	GO-FLO	in the water	03° 07,913' N	049° 40,873' W
M147_112-1	05/16/18 07:47	GO-FLO	max depth/on ground	03° 07,892' N	049° 41,002' W
M147_112-1	05/16/18 07:51	GO-FLO	on deck	03° 07,867' N	049° 41,170' W

M147_113-1	05/16/18 12:28	CTD	in the water	03° 01,870' N	049° 01,853' W
M147_113-1	05/16/18 12:33	CTD	max depth/on ground	03° 01,988' N	049° 01,886' W
M147_113-1	05/16/18 12:39	CTD	on deck	03° 02,100' N	049° 01,916' W
M147_113-2	05/16/18 12:41	Pump	in the water	03° 02,109' N	049° 01,918' W
M147_113-2	05/16/18 12:52	Pump	on deck	03° 02,371' N	049° 01,988' W
M147_114-1	05/16/18 12:56	GO-FLO	in the water	03° 02,325' N	049° 01,968' W
M147_114-1	05/16/18 12:58	GO-FLO	max depth/on ground	03° 02,338' N	049° 01,963' W
M147_114-1	05/16/18 13:03	GO-FLO	on deck	03° 02,457' N	049° 01,987' W
M147_115-1	05/16/18 14:56	CTD	in the water	03° 15,998' N	048° 52,159' W
M147_115-1	05/16/18 15:02	CTD	max depth/on ground	03° 16,070' N	048° 52,305' W
M147_115-1	05/16/18 15:10	CTD	on deck	03° 16,181' N	048° 52,510' W
M147_115-2	05/16/18 15:12	Pump	in the water	03° 16,218' N	048° 52,564' W
M147_115-2	05/16/18 15:32	Pump	on deck	03° 16,436' N	048° 53,237' W
M147_116-1	05/16/18 21:49	CTD	information	03° 59,966' N	048° 18,045' W
M147_116-1	05/16/18 22:11	CTD	max depth/on ground	04° 00,052' N	048° 18,250' W
M147_116-1	05/16/18 22:34	CTD	on deck	04° 00,211' N	048° 18,518' W
M147_117-1	05/17/18 10:26	MUC	in the water	02° 19,250' N	048° 37,903' W
M147_117-1	05/17/18 10:28	MUC	max depth/on ground	02° 19,249' N	048° 37,903' W
M147_117-1	05/17/18 10:31	MUC	on deck	02° 19,249' N	048° 37,903' W
M147_118-1	05/17/18 14:17	CTD	in the water	02° 04,068' N	048° 16,994' W
M147_118-1	05/17/18 14:22	CTD	max depth/on ground	02° 04,192' N	048° 17,068' W
M147_118-1	05/17/18 14:27	CTD	on deck	02° 04,313' N	048° 17,120' W
M147_118-2	05/17/18 14:29	Pump	in the water	02° 04,358' N	048° 17,113' W
M147_118-2	05/17/18 14:39	Pump	on deck	02° 04,610' N	048° 17,157' W
M147_119-1	05/17/18 14:39	GO-FLO	in the water	02° 04,607' N	048° 17,156' W
M147_119-1	05/17/18 14:41	GO-FLO	max depth/on ground	02° 04,668' N	048° 17,183' W
M147_119-1	05/17/18 14:45	GO-FLO	on deck	02° 04,756' N	048° 17,223' W
M147_120-1	05/17/18 22:23	CTD	in the water	00° 58,977' N	047° 43,013' W
M147_120-1	05/17/18 22:27	CTD	max depth/on ground	00° 58,912' N	047° 43,064' W
M147_120-1	05/17/18 22:32	CTD	on deck	00° 58,824' N	047° 43,126' W
M147_120-2	05/17/18 22:35	Pump	in the water	00° 58,794' N	047° 43,161' W
M147_120-2	05/17/18 22:43	Pump	on deck	00° 58,632' N	047° 43,297' W
M147_121-1	05/17/18 22:44	GO-FLO	in the water	00° 58,606' N	047° 43,312' W
M147_121-1	05/17/18 22:46	GO-FLO	max depth/on ground	00° 58,554' N	047° 43,355' W
M147_121-1	05/17/18 22:49	GO-FLO	on deck	00° 58,473' N	047° 43,413' W
M147_122-1	05/18/18 02:23	CTD	in the water	01° 21,575' N	047° 23,023' W
M147_122-1	05/18/18 02:27	CTD	max depth/on ground	01° 21,631' N	047° 23,051' W
M147_122-1	05/18/18 02:33	CTD	on deck	01° 21,696' N	047° 23,103' W
M147_122-2	05/18/18 02:35	Pump	in the water	01° 21,717' N	047° 23,120' W
M147_122-2	05/18/18 02:53	Pump	on deck	01° 21,932' N	047° 23,299' W
M147_123-1	05/18/18 02:52	GO-FLO	in the water	01° 21,922' N	047° 23,292' W
M147_123-1	05/18/18 02:55	GO-FLO	max depth/on ground	01° 21,961' N	047° 23,322' W
M147_123-1	05/18/18 02:59	GO-FLO	on deck	01° 21,996' N	047° 23,354' W
M147_124-1	05/18/18 12:02	CTD	in the water	00° 32,836' N	048° 00,393' W
M147_124-1	05/18/18 12:05	CTD	max depth/on ground	00° 32,772' N	048° 00,486' W
M147_124-1	05/18/18 12:08	CTD	on deck	00° 32,717' N	048° 00,581' W
M147_125-1	05/18/18 12:21	GO-FLO	in the water	00° 32,481' N	048° 01,028' W
M147_125-1	05/18/18 12:22	GO-FLO	max depth/on ground	00° 32,458' N	048° 01,084' W
M147_125-1	05/18/18 12:26	GO-FLO	on deck	00° 32,400' N	048° 01,209' W

M147_126-1	05/18/18 19:55	CTD	in the water	01° 38,035' N	048° 35,958' W
M147_126-1	05/18/18 19:58	CTD	max depth/on ground	01° 38,087' N	048° 35,872' W
M147_126-1	05/18/18 20:02	CTD	on deck	01° 38,147' N	048° 35,775' W
M147_127-1	05/18/18 20:28	GO-FLO	in the water	01° 38,216' N	048° 35,629' W
M147_127-1	05/18/18 20:30	GO-FLO	max depth/on ground	01° 38,230' N	048° 35,601' W
M147_127-1	05/18/18 20:32	GO-FLO	on deck	01° 38,237' N	048° 35,581' W

Gear acronyms in the Station list and explanations:

CTD	CTD-SS stainless steel water sampler with Niskin bottles
CTD/TM	Trace metal clean CTD water sampler with GO-FLO bottles
Underway water sampling	Towed Fish surface water sampler
Pump	In-situ pumping system for Ra isotopes
MUC	Multicorer (surface sediment)
GO-FLO	Individual GO-FLO Bottle Water Sampler on Kevlar rope