

# Cruise report RV Pelagia 64PE433

## Saba, St Eustatius and Saba Bank

### Benthic habitat mapping, and Benthic–Pelagic coupling

26 February - 10 March 2018  
St Maarten-St Maarten (*NICO expedition leg 6*)



Scientific party NICO expedition Leg 6  
Fleur C. van Duyl and Erik H. Meesters (eds)



The complete team of participants of the NICO expedition Leg 6

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## 2 Introduction

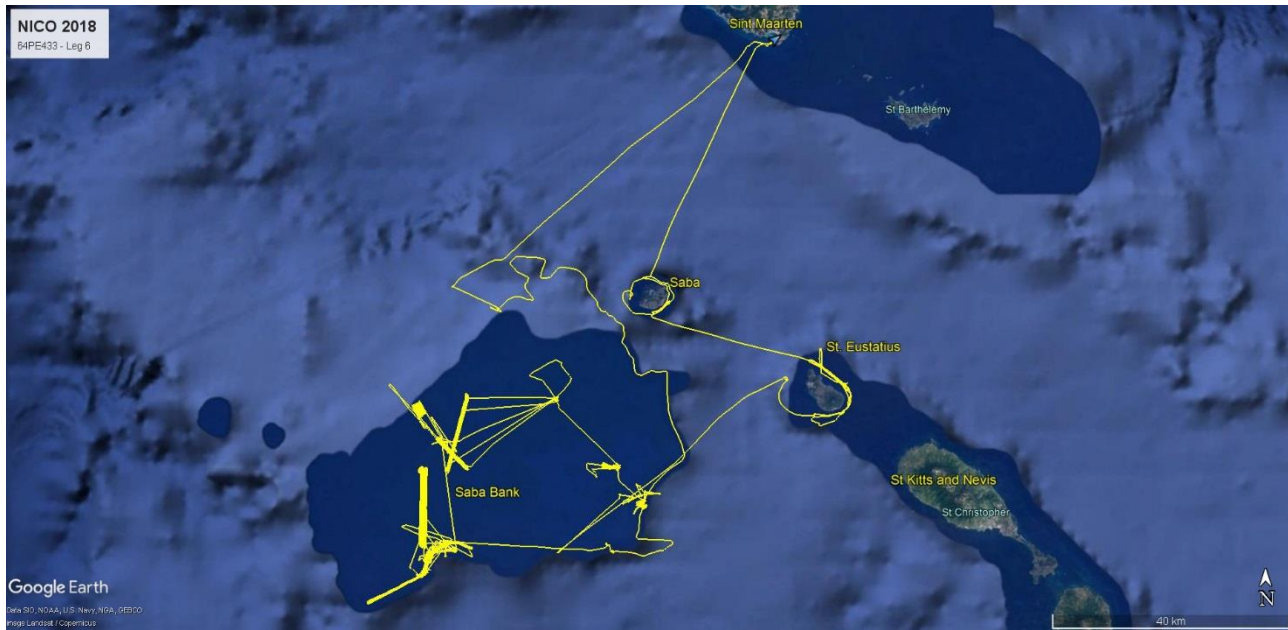


Figure 2.1.1. In yellow the approximate track that was covered by the RV Pelagia, starting at St. Maarten and going to the Saba Bank via Saba and St. Eustatius.

### 2.1 Aim and Background.

This research expedition in the Caribbean Sea was one of the NICO expeditions (Netherlands Initiative Changing Oceans) funded by NWO and coordinated by NIOZ-NMF in 2018. One of the aims was to accommodate research proposals of Dutch research institutes and Universities to study various aspects in the Caribbean from the RV Pelagia. During our 13-day cruise five different projects were accommodated with the originally submitted titles:

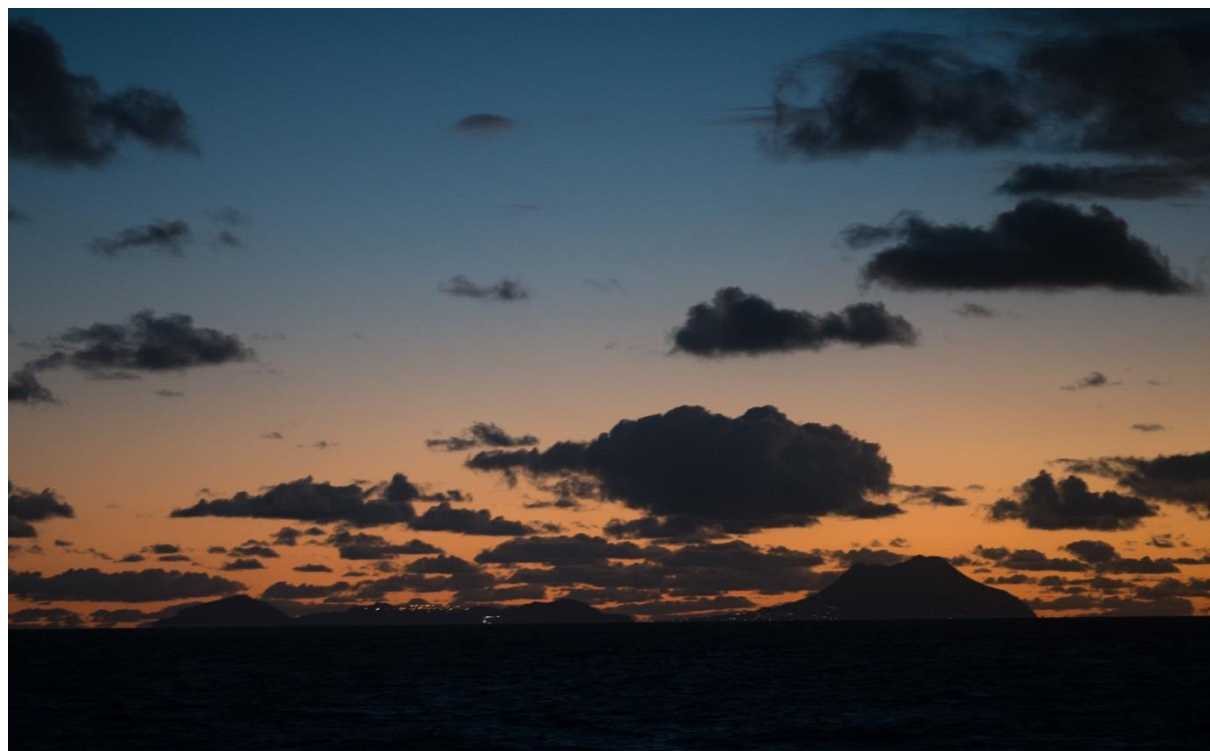
- Net calcification in different benthic habitats on the Saba Bank (NIOZ-MMB, Fleur C. van Duyl)
- Windward reefs of Dutch Caribbean (WUR, Erik H. Meesters)
- Living in the shadow – Biogeochemical functioning and benthic-pelagic coupling across the Saba Bank (NIOZ-EDS, Karline Soetaert)
- On-track sampling while teaching young-career scientists (NIOZ-MMB, Corina Brussaard)
- For PR purposes an ocean music composer was added (Stef Veldhuis)

Scientific proposals were instigated by the fact that still limited information is available of the marine environment surrounding the Dutch Islands of Saba and St Eustatius in the Caribbean, and of the huge subsea carbonate platform close to these islands, the Saba Bank. Since several years research activities coordinated by Dutch scientists (WUR-WMR, NIOZ) are increasing in the region with expeditions to the Saba Bank with the Caribbean Explorer II in 2011, 2013, 2015 (with emphasis on coral reef monitoring and preliminary work on carbonate chemistry in 2015) and a RV Pelagia cruise in 2016 (with emphasis on carbonate chemistry, trophic conditions in the water column and benthic-pelagic coupling).

Scientific aims of this NICO leg 6 expedition were:

1. Exploring and mapping of the windward mesophotic reefs and bathymetry of Saba and St Eustatius, and proceeding with the mapping of benthic habitats (from 10 until 100m depth) of the Saba Bank with the aim to link the benthic habitat descriptions that result from the mapping to benthic metabolism.
2. Investigating benthic-pelagic coupling of different benthic habitats between 15 and 28m depth on the Saba Bank with focus on net calcification, organic matter (bio)deposition/ mineralization and oxygen dynamics in the benthic boundary layer.

Saba, St Eustatius and the Saba Bank are fringed by coral reef communities growing on the volcanic foot of the islands, and on top and along the slopes of the subsea carbonate platform, the Saba Bank. On the Bank 7 stations were visited characterized by different benthic communities, coral reef on the slope at the S-SE side (Coral Garden), a patch reef (Tertre de Fleur), a Sargassum field, a sandy plain, healthy coral reef communities, and a crustose coralline algae (CCA) covered back reef.



*St. Eustatius viewed from sea at sunset.*

## 2.2 Scientific party

|                     |                       |                                                             |
|---------------------|-----------------------|-------------------------------------------------------------|
| Fleur C. van Duyl   | NIOZ-MMB              | Chief Scientist/Exp. Leader<br>Coral reef microbial ecology |
| Erik H. Meesters    | WMR                   | Co-Chief Scientist, Coral reef ecology                      |
| Laurent Devriendt   | NIOZ-OCS              | Carbonate chemistry                                         |
| Didier de Bakker    | WMR/NIOZ              | Carbonate chemistry                                         |
| Alice Webb          | NIOZ-OCS              | Carbonate chemistry                                         |
| Emil de Borger      | NIOZ-EDS              | Biogeochemistry                                             |
| Milou Arts          | UvA- Master student   | Metabolomics, metagenomics                                  |
| Tom Theirlynk       | NICO-student UvA      | Oceanography                                                |
| Lucas Tichy         | NICO- student Radboud | Oceanography                                                |
| Pieter van Rijswijk | NIOZ-EDS              | Biological analyst                                          |
| Bob Koster          | NIOZ-OCS              | Technician                                                  |
| Sharyn Ossebaar     | NIOZ-OCS              | Chemical analyst                                            |
| Jan Dirk de Visser  | NIOZ-NMF              | Technician                                                  |
| Stef Veldhuis       | Volunteer             | Ocean music composer                                        |

## 2.3 Acknowledgements

We are grateful for the solid and dedicated support of the crew of the RV Pelagia.

|                |                         |
|----------------|-------------------------|
| John Ellen     | Captain                 |
| Bert Puijman   | 1 <sup>st</sup> Officer |
| Noortje Loonen | 2 <sup>nd</sup> Officer |

|                     |                          |
|---------------------|--------------------------|
| Bert Hogewerf       | Chief Engineer           |
| Inno Meijers        | 2 <sup>nd</sup> Engineer |
| Cor Stevens         | Bosun                    |
| Martin de Vries     | Sailor                   |
| Norberto dos Santos | Sailor                   |
| Peter van Maurik    | Sailor                   |
| Iwan van Breejen    | Cook                     |
| Vitalijs Maximovs   | Steward                  |

We thank NIOZ National Marine Facilities (NMF) for logistic support from the home base on Texel, i.e. Erica Koning, Henk de Haas, Joep van Haaren and Mildred Jourdan. Without the financial support of NWO this NICO cruise would not have been possible. Erik Meesters was financially supported by the Ministry of Agriculture, Nature and Food Quality, program Caribbean Netherlands (BO-43-021.04).

### 3 Itinerary and scientific program

#### 3.1 Cruise map



Figure 3.1.1. Station number and approximate location where activities took place during leg 6 of the NICO expedition.

On 26 February the cruise set off from St Maarten to the north side of Saba, where we arrived at 17:30h local time at our first station. Position of stations can be seen in Figure 3.1.1.; position of hopper frame stations are shown in Figure 4.1.1.. After surveys around Saba for bathymetry and underwater benthic habitats by photography (Station 1 and hopper stations 201-203) it went to the windward side of St Eustatius for more of these activities (Station 2, 204-209). From the S-tip of St Eustatius we sailed to the S-side of the Saba Bank (Station 3, NICO station deep). After that, a transect was made from the SE side towards the NW (Stations 4, 5, 6, 7, 8; hopper stations 210-222). From there the cruise proceeded towards the SW corner of the Saba Bank (stations, 9, 10, 11, 12, 13; hopper stations 223-239). Station 14 was at the SE corner and station 15 (hopper station 239) at the NW corner. During the cruise the station numbers 1-15 were assigned to the 15 “geographic” stations (with stations 3-15 positioned on or close by the Saba Bank) with at each station up to 19 separate activities e.g. CTD, landers and/or boxcores were performed. Transects with the Hopper camera frame were numbered 201 to 239 (see appendix for complete list of these activities). Bathymetry transects did not get station numbers. Date, time and position of these tracks were stored in Casino (backed up at NIOZ). On 9 and 10 March moorings (thermistor strings) of Hans van Haren (NIOZ) were recovered in the vicinity of Stn 14 and Stn 15. The cruise ended on 10 March in the

harbor of Philipsburg St Maarten in the late afternoon. For a complete overview of stations and activities see appendix 5.1.

### 3.2 Equipment

Most important sea survey devices used during this cruise were the

- a. **Multibeam** to survey the bathymetry of the deeper reefs and missing parts of the Saba Bank (in cooperation with the Dutch Hydrographic Service)
- b. **CTD rosette** to obtain profiles of salinity, temperature, density, oxygen concentrations, fluorescence, underwater light measurements (PAR) and collect water samples with Niskin bottles. Four Niskin bottles (of 24) were removed to attach a Laser In Situ Scattering and Transmissometer (LISST) to the CTD frame for particle measurements (see 4.5).
- c. **Hopper** frame equipped with HR video, two Nikon D800 camera's, a GoPro camera, laser and sonar for online recording of benthic communities (see 4.1).
- d. **Bottom water gradient sampler**, called **PUMPY**. The PUMPY lander consists of a tripod carrying six 10L bags which are filled with water by six electric pumps connected to a battery pack with timer 45min after deployment of the lander. Water is pumped into the bags for 30 min after it landed on the bottom. Water was taken from 6 different depths above the bottom (10, 20, 40, 80, 160, 300cm ab). The lander carried a Nortek Aquadopp Profiler (2MHz) positioned horizontally on the tail with sensors looking upwards at the far end (ca 40 cm above the bottom). On the opposite side a SB37 Microcat CTD plus dissolved oxygen sensor (optode) was connected. To monitor the light an Odyssey light logger was attached to the frame. On the 3m pole sticking upwards from the middle of the lander a GoPro camera was attached to record the actual benthic community Pumpy has landed in. PUMPY was deployed 3 times per day for up to 2 hrs and 3-4 times per station. It was moored each time with its own 2-step anchoring device and floats (including pick up line).
- e. Eddy Covariance lander, called **EDCO**. The EDCO is a tripod lander equipped with two oxygen microelectrodes and a Nortek Acoustic Doppler velocimeter in the middle. The frame also carried a Nortek Aquadopp profiler (2MHz), positioned vertically (ca 1.2 m ab) and looking downwards, and a GoPro camera. The EDCO deployments lasted ca 24 hrs per station. The lander was moored by itself with float on top with pick up line
- f. Large **Boxcore** (50cm diam) equipped with as well as without online camera in sandy areas.



*RV Pelagia moored in Sint Maarten.*

## 4 Reports of scientific activities

### 4.1 Benthic habitat mapping (Erik Meesters)

**Error! Reference source not found.**1.1 shows the approximate locations of the hopper frame stations (average position). On each location the hopper frame was lowered to 0.5-1m above the bottom and a transect was run to photograph and film the bottom. The whole transect was filmed in HD by a downward looking camera and in 720p by a forward looking camera. Additionally, a Gopro camera took one picture every 5 seconds and two Nikon D800 DSLRs could be triggered from the control room to take pictures.



Figure 4.1.1. Hopper station number (201-239) and approximate location.

Total transect length varied between 145 and 1787m (Table 4.1.1) and in total almost 25km of photos and video was recorded.

Table 4.1.1. Approximate hopper frame transect length and average depth calculated from ships gps log.

| Station | Length (m) | Depth (m) | Station | Length (m) | Depth (m) |
|---------|------------|-----------|---------|------------|-----------|
| 201     | 536        | NA        | 221     | 390        | 31        |
| 202     | 188        | 53        | 222     | 313        | 34        |
| 203     | 181        | 62        | 223     | 659        | 34        |
| 204     | 145        | 29        | 224     | 326        | 22        |
| 205     | 798        | 62        | 225     | 308        | 27        |
| 206     | 1370       | 40        | 226     | 266        | 31        |
| 207     | 310        | 65        | 227     | 403        | 25        |
| 208     | 471        | 46        | 228     | 411        | 28        |
| 209     | 257        | 54        | 229     | 447        | 25        |
| 210     | 784        | 22        | 230     | 199        | 28        |
| 211     | 558        | 11        | 231     | 237        | 30        |
| 212     | 510        | 51        | 232     | 1787       | 24        |
| 213     | 562        | 19        | 233     | 999        | 54        |
| 214     | 1516       | 21        | 234     | 450        | 30        |
| 215     | 601        | 21        | 235     | 610        | 24        |
| 216     | 1328       | 23        | 236     | 435        | 22        |
| 217     | 1293       | 25        | 237     | 829        | 24        |
| 218     | 654        | 25        | 238     | 968        | 36        |
| 219     | 511        | 25        | 239     | 989        | 83        |
| 220     | 923        | 27        | Total   | 24522      |           |

A relatively large amount of time was spent in the south western corner of the bank with station numbers 224-238 (Figure 4.1.2).



Figure 4.1.2. Close up of hopper station number 224-238.

A short qualitative description of several stations follows.

### Station descriptions (Date Time in GMT/UTC)

#### Station 201 (26 February 22:42-23:21)

This transect ran from south to north over the famous pinnacle on Saba (Figure 4.1.3).

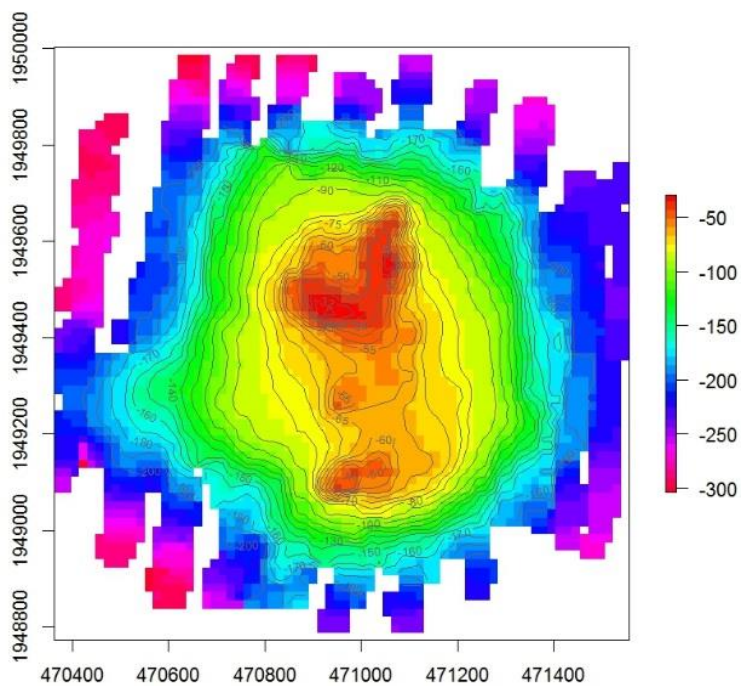
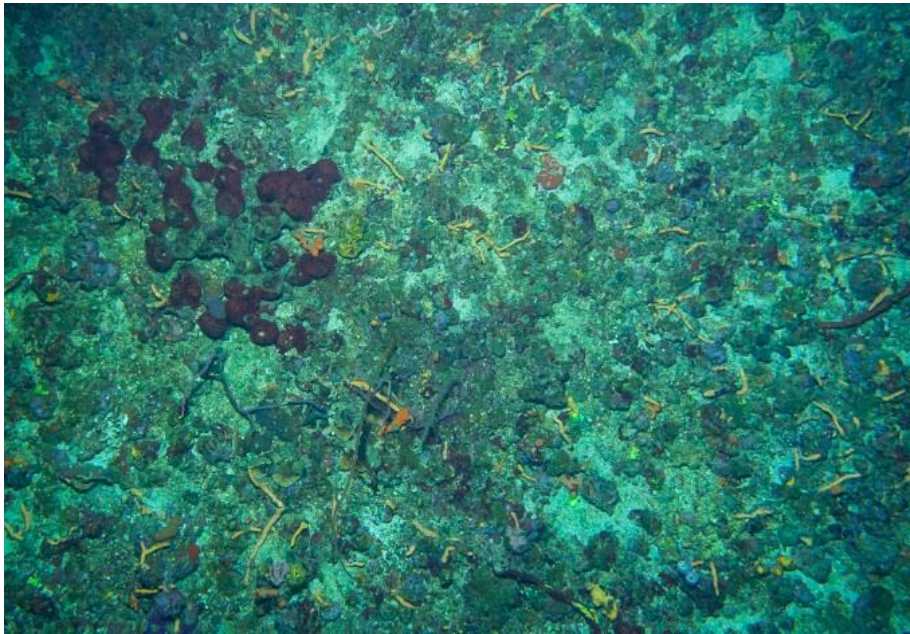


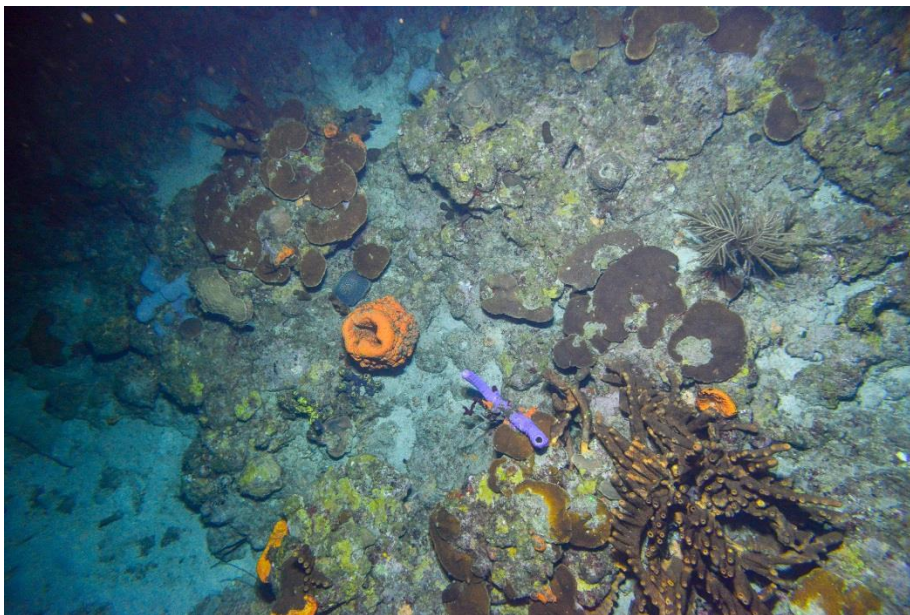
Figure 4.1.3. Saba Pinnacle.

Most of the area is dominated by macroalgae (Lobophora), sponges, and calcareous algae. Because of the depth which is too deep for extensive coral growth the few corals present are mainly platelike corals of the Agariciidae.



*Figure 4.1.4. Picture taken on transect 201. Station 202 (27 February 00:29-00:40)*

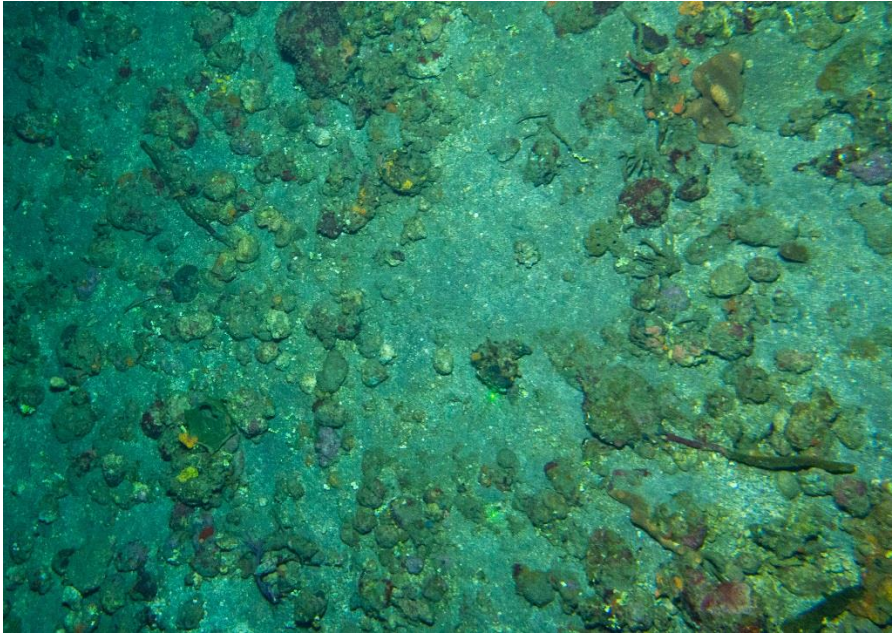
This station is at the south side of Saba. Coral cover is generally quite high together with soft corals, sponges, and benthic algae.



*Figure 4.1.5. Picture from transect 202.*

#### Station 203 (27 Feb. 01:06-01:15)

At the east side of Saba this transect was photographed. It's dominated by sand with rubble stones in some places and is rather steep. It appears that there is a lot of sediment transport down the slope.



*Figure 4.1.6. Picture from transect 203.*

Station 204 (27 Feb. 11:59-12:09)

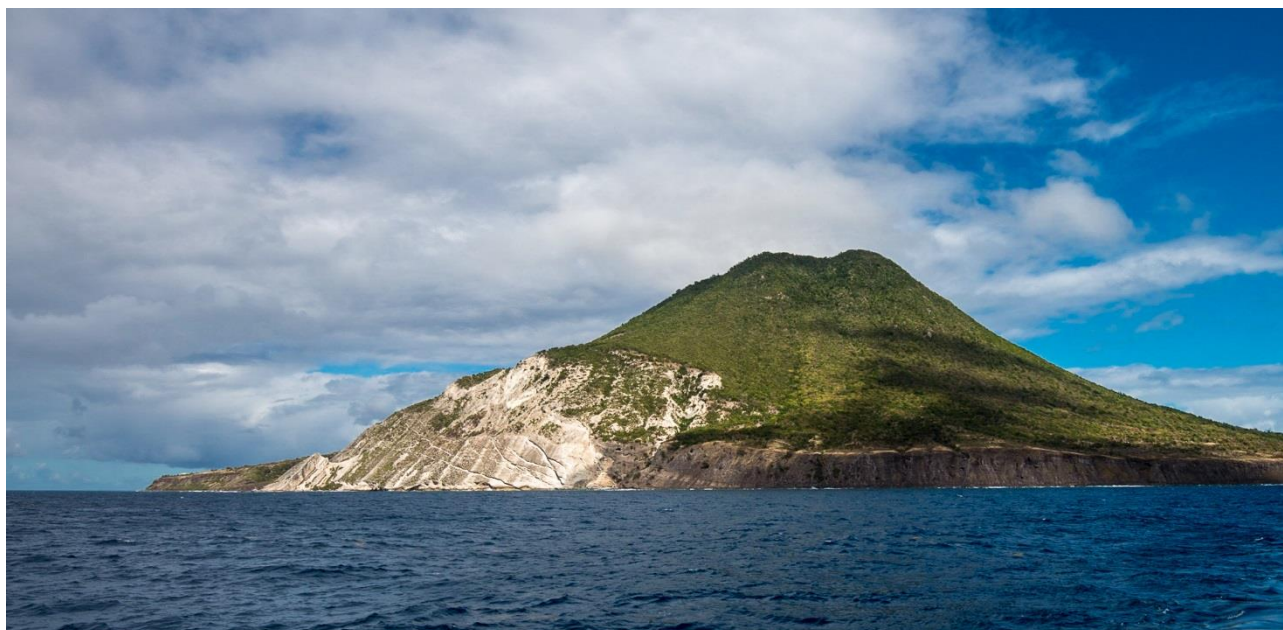
This station lies at the east side of St. Eustatius. It's a sandy (volcanic sand) area with patches of sea grass.



*Figure 4.1.7. Sea grass dominated transect east of St. Eustatius.*

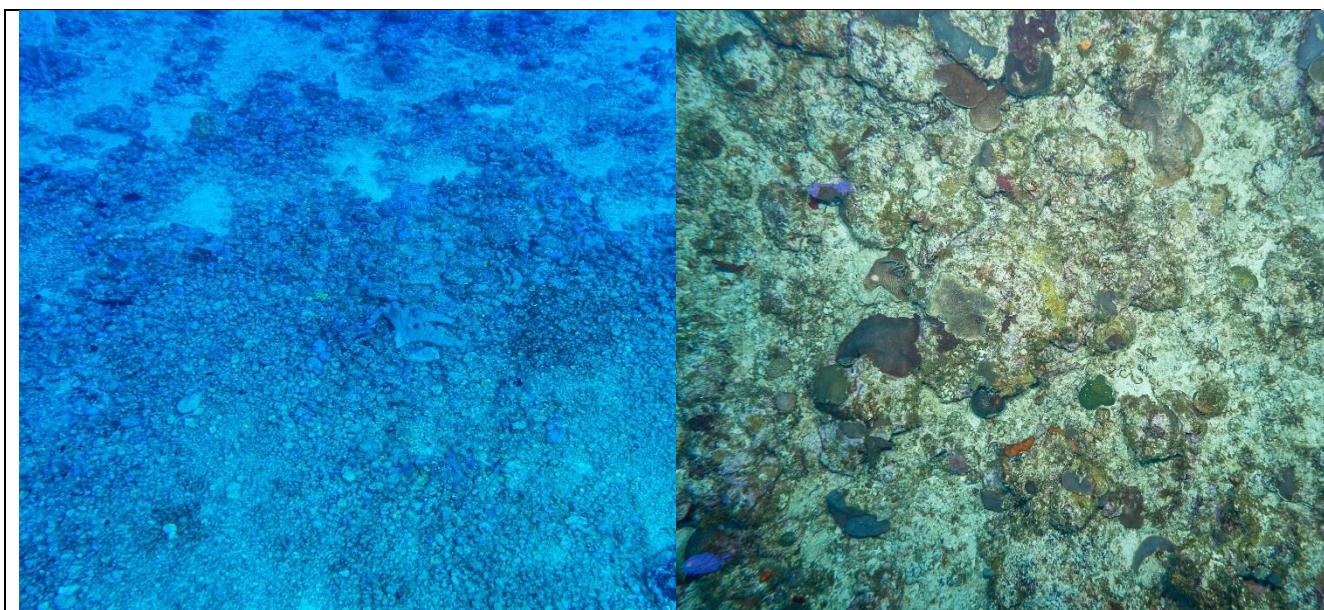
Station 205 (27 Feb. 12:46-13:20)

This transect runs southwest and lies southeast of White Wall a remarkable part of the island (below).



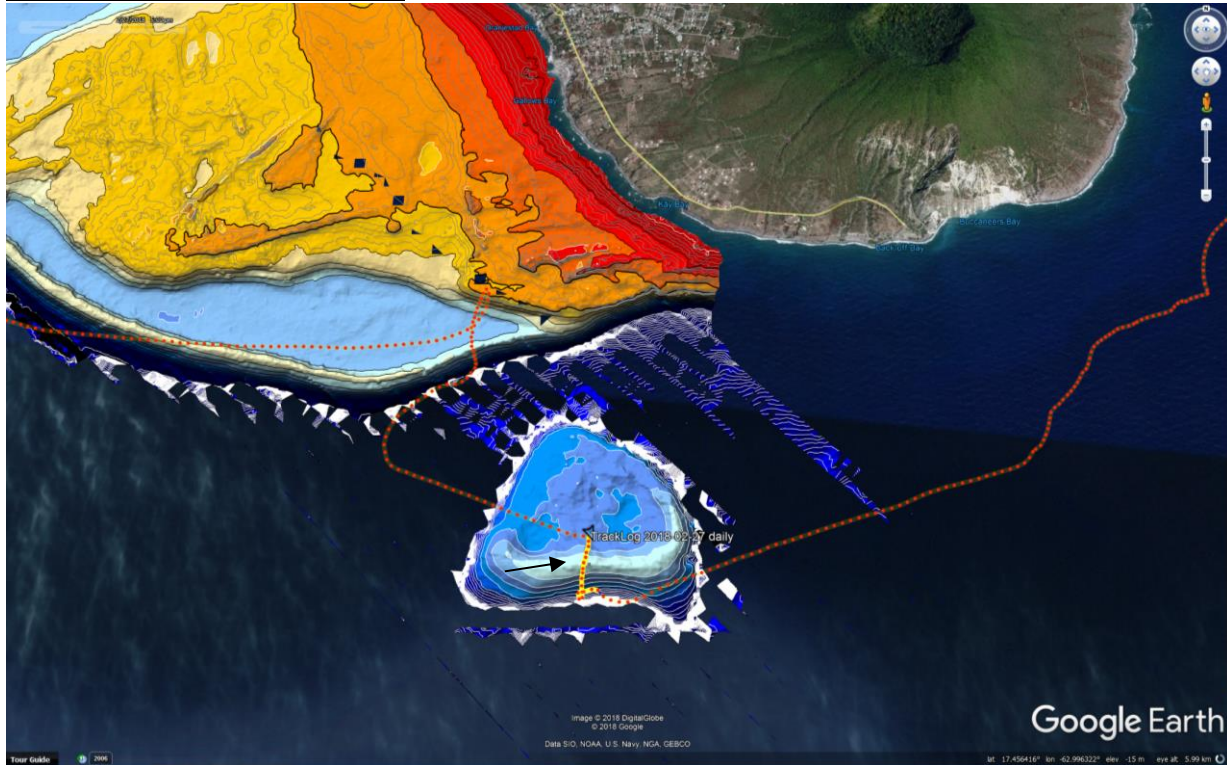
*Figure 4.1.8. White Wall.*

The bottom slopes steeply and has occasionally outcrops of large rock material covered by flat coral plates. In places the bottom is dominated by rubble, while in other parts corals and algae dominate.



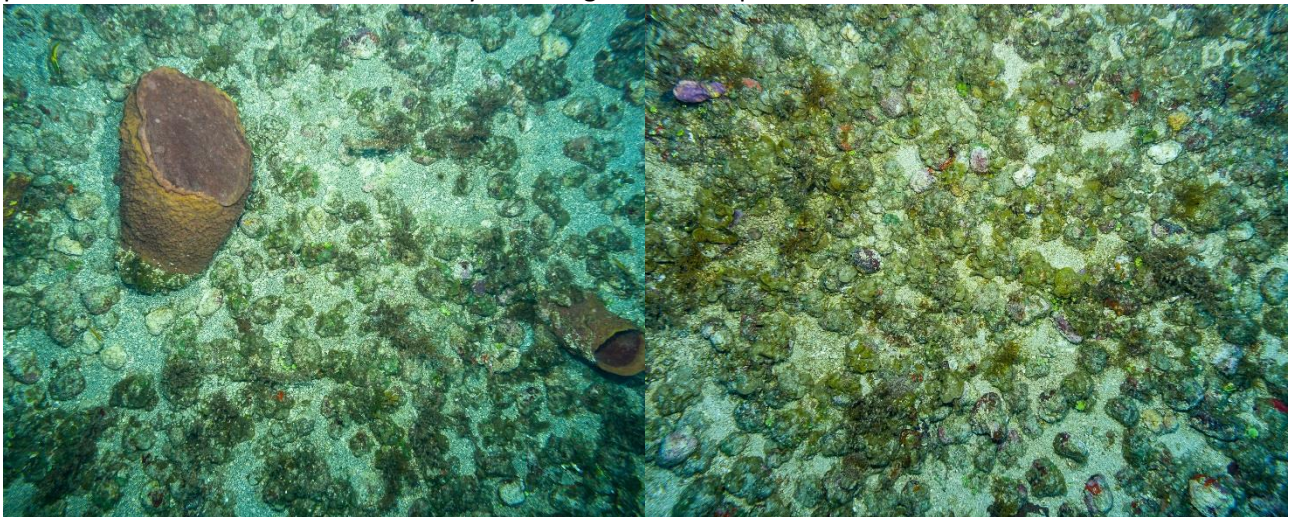
*Figure 4.1.9. Bottom pictures of station 205.*

Station 206 (27 Feb. 13:53-14:39)



*Figure 4.1.10. Pelagia track and hopper frame track of station 206. Maps shows St. Eustatius and Bathymetry.*

The track is going straight up the pinnacle on the south side of St Eustatius. The slope area is an area that is very sandy with rounded stones probably formed by corals or calcareous algae. Shallower on top of the pinnacle the bottom is more covered by macroalgae like Lobophora.



*Figure 4.1.11. Pictures of station 206.*

Station 207 (27 Feb. 15:08-15:27)

Many sub-sea features are remnants of previous sea level stands where during long-lasting periods of relatively little sea level change reefs have grown and created bottom structures that still can be seen today. So also at station 207 where a bathymetric map shows lava flows and an old reef crest that follows a lagoon.

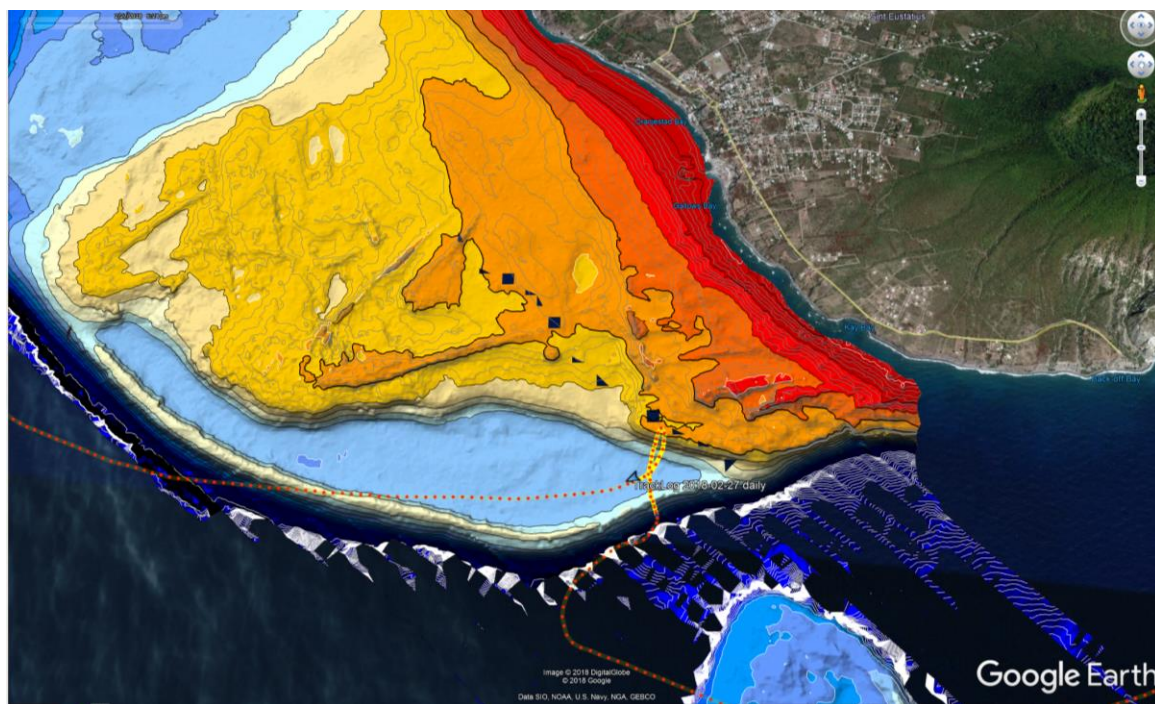


Figure 4.1.12. Pelagia track and hopper frame track of station 207. Maps shows St. Eustatius and Bathymetry.

The track at station 207 crosses the submerged lagoon at approximately 45m depth.

#### Station 239 (10 Mar. 14:42-15:43)

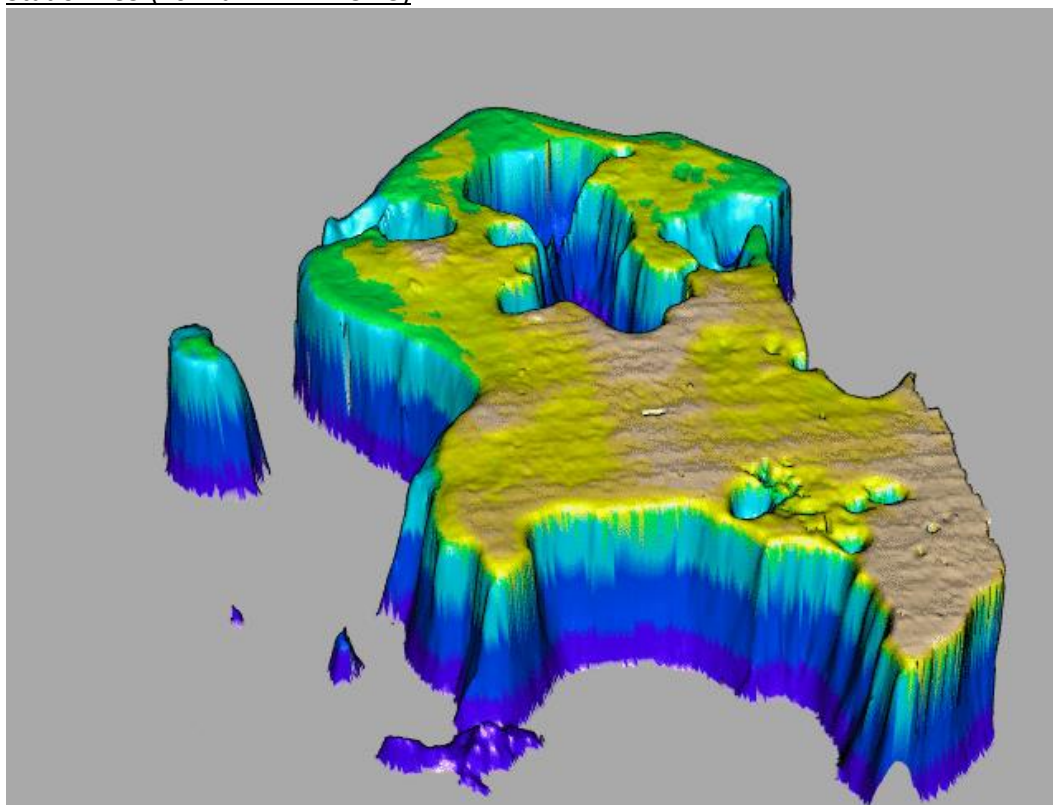


Figure 4.1.13. Three D picture of the Luymes Bank. The top of the bank is around 80m deep.

The northern part of the Saba Bank is called the Luymes Bank. It has several sinkholes, large holes in the carbonate bottom that have been created during periods that the bank was above sea. These holes range from 100m to several kilometres in diameter and are from 100-300m deep. Transect 239 actually went down in two of these sink holes. Starting at 80m depth the hopper frame was lowered in the first sink hole

which was approximately 200m wide. At the bottom of the sink hole a large community of calcareous algae was found that consists of thousands of little pillars (see below figure).



*Figure 4.1.14. Calcium carbonate pillars made up from calcareous algae on the bottom (app. 100m) of a sinkhole on the Luymes Bank.*

| Other hopper frame stations still to be described |                                  |
|---------------------------------------------------|----------------------------------|
| Station 208 (27 Feb. 15:51-16:18)                 | Station 224 (5 Mar. 23:18-23:42) |
| Station 209 (27 Feb. 17:23-17:40)                 | Station 225 (6 Mar. 00:01-00:19) |
| Station 210 (27 Feb. 22:39-23:30)                 | Station 226 (6 Mar. 13:29-13:48) |
| Station 211 (28 Feb. 11:36-13:16)                 | Station 227 (6 Mar. 13:58-14:32) |
| Station 212 (28 Feb. 13:59-14:33)                 | Station 228 (6 Mar. 14:48-15:12) |
| Station 213 (1 Mar. 19:07-20:07)                  | Station 229 (6 Mar. 18:16-18:55) |
| Station 214 (2 Mar. 12:35-14:00)                  | Station 230 (6 Mar. 19:10-19:25) |
| Station 215 (2 Mar. 14:29-15:06)                  | Station 231 (6 Mar. 19:51-20:08) |
| Station 216 (3 Mar. 23:58-00:44)                  | Station 232 (7 Mar. 23:33-00:36) |
| Station 217 (3 Mar. 12:34-13:17)                  | Station 233 (7 Mar. 13:29-14:11) |
| Station 218 (3 Mar. 13:36-13:58)                  | Station 234 (7 Mar. 14:32-15:56) |
| Station 219 (3 Mar. 14:30-14:45)                  | Station 235 (7 Mar. 20:20-20:57) |
| Station 220 (3 Mar. 14:59-15:32)                  | Station 236 (7 Mar. 21:21-21:51) |
| Station 221 (4 Mar. 13:32-13:48)                  | Station 237 (8 Mar. 13:36-14:59) |
| Station 222 (4 Mar. 14:21-14:34)                  | Station 238 (8 Mar. 23:11-00:14) |
| Station 223 (5 Mar. 18:42-20:01)                  |                                  |



#### 4.2 Multibeam data (Erik Meesters, Bob Koster, Henk de Haas)

During the expedition the multibeam was used whenever possible. Depending on the bottom depth and the slope of the bottom, the width of one multibeam track covered from several tens to several hundreds of meters. We tried to integrate the multibeam data already on board into coarse maps (Figure 4.2.1-Figure 4.2.6), but they will need to be further cleaned and processed.

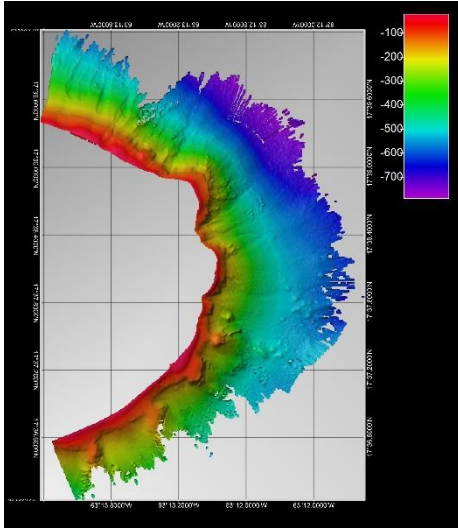


Figure 4.2.1. East side bathymetry of Saba.

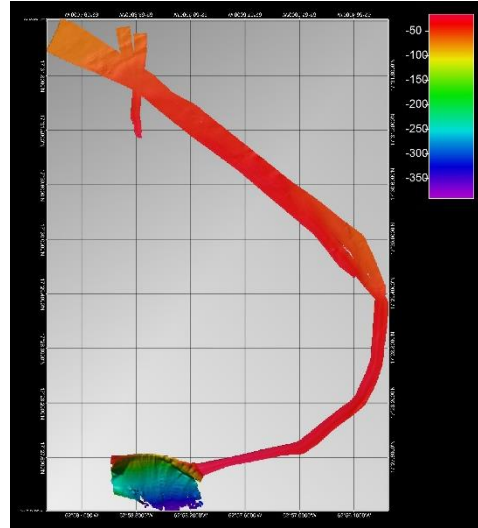


Figure 4.2.2. Bathymetry data collected around St. Eustatius.

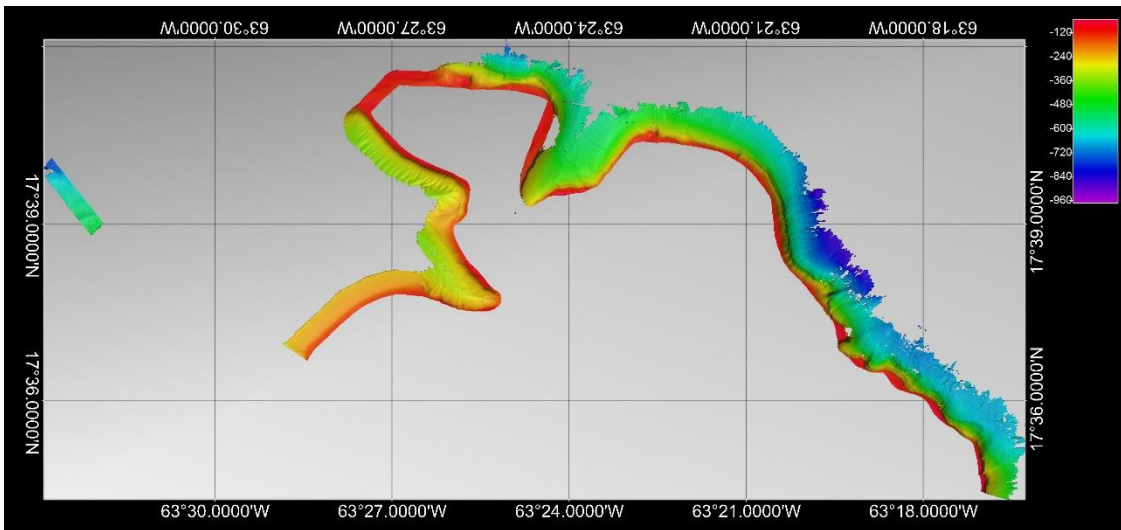


Figure 4.2.3. Bathymetry data collected along the North-eastern edge of the Saba Bank.

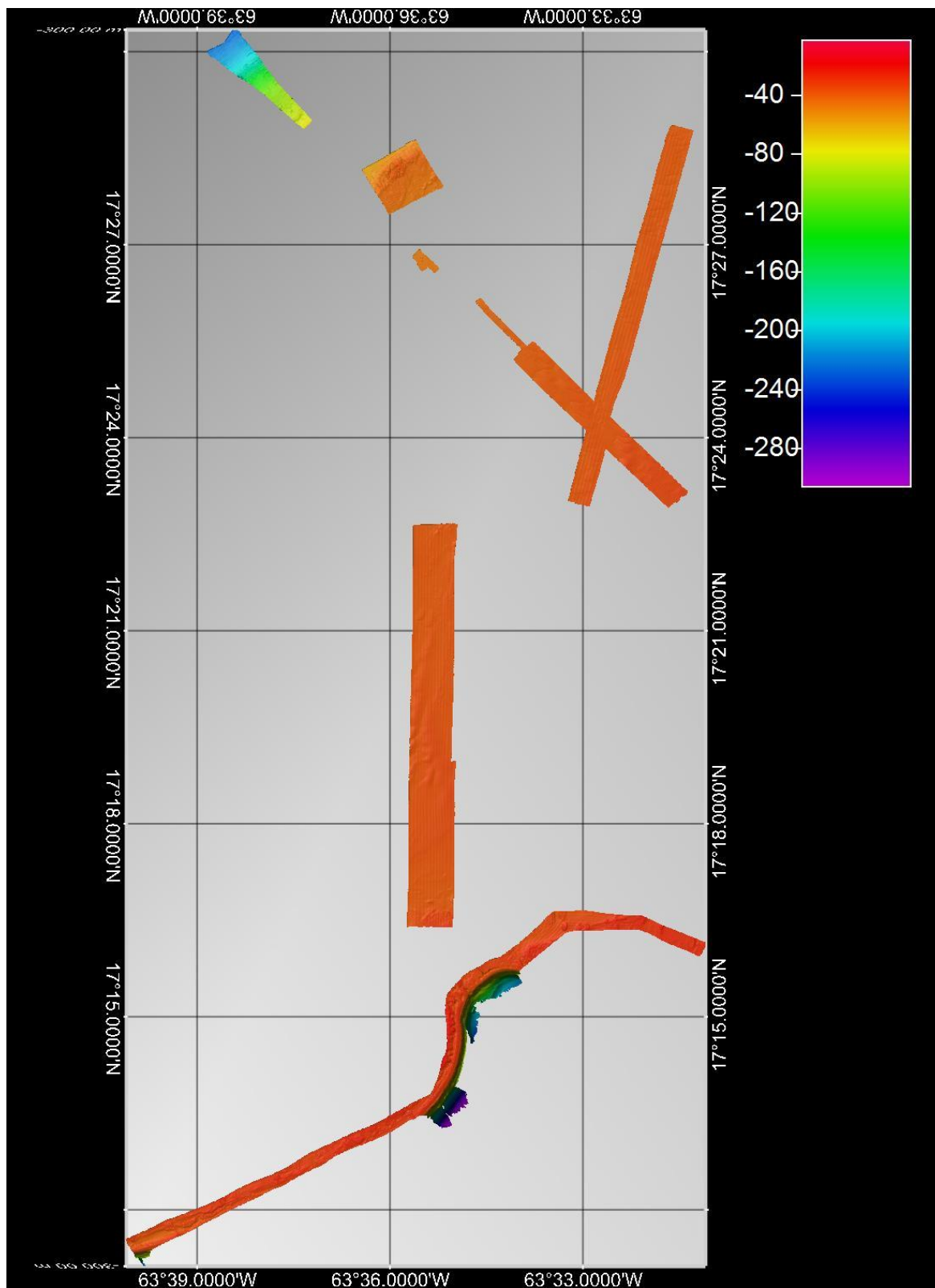


Figure 4.2.4. Bathymetry data collected in the middle and southern part of the Saba Bank.

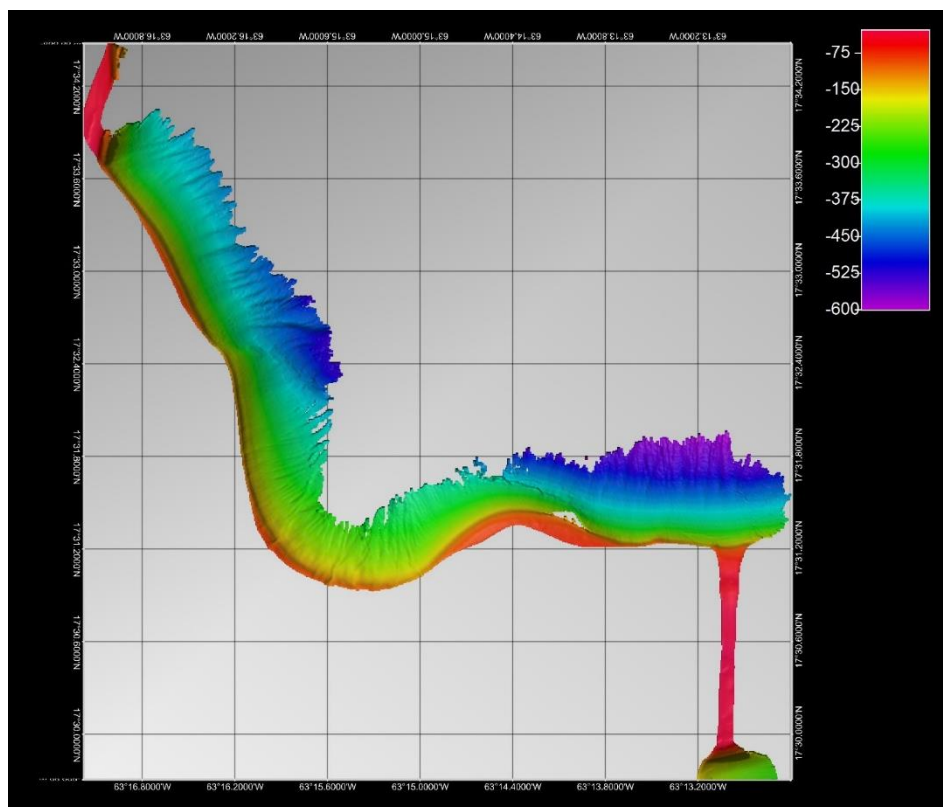


Figure 4.2.5. Bathymetric data connecting to previous figure.

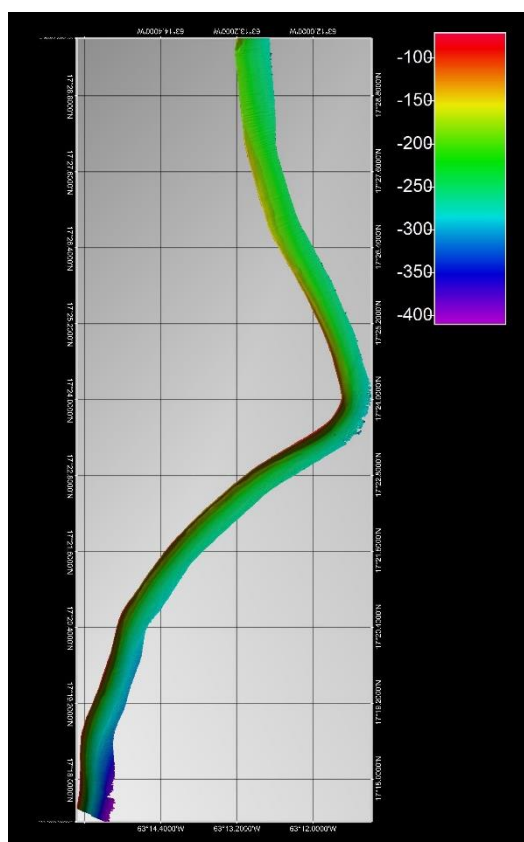


Figure 4.2.6. Bathymetric data of the edge of the Saba Bank connecting to previous figure.

#### 4.3 Characterization of the carbonate chemistry dynamics above the Saba Bank (Alice Webb, Didier de Bakker, Laurent de Vriendt)

To assess coral reef health, it is necessary to validate net community calcification (or dissolution) in the field, for instance by determining alkalinity fluxes from the reef. We investigate the in situ fluxes of alkalinity, DIC, and nutrients over the Saba Bank offshore from the island of Saba, Dutch Caribbean. 340 seawater samples were collected and measured for their alkalinity, DIC and nutrients content to determine if and how biologic and/or inorganic processes occurring on the Saba bank (i.e. calcification/dissolution and photosynthesis/respiration) alter the carbonate chemistry of the overlying water mass.

Seawater was collected above the Saba bank at 6 stations (#4, 5, 6, 7, 9, 10 and 11). At each station, seawater was sampled 3 to 4 times using the CTD units and with the PUMPY device. Sampling time was early morning for the night signal, at midday and late in the afternoon. During CTD sampling, water was taken at ~ 4 m above the sea floor and at 2 to 4 additional water depths from the bottom to the surface depending on the water column depth. During PUMPY sampling, seawater was collected simultaneously at 10, 20, 40, 80, 160 and 300 cm from the seafloor. Seawater was also collected off the Saba bank at 4 stations (#4-15, 8-1, 14-1 and 15-1) to characterize the carbonate chemistry of the open ocean near the bank.

Sampling and analysis for alkalinity broadly followed the standard operating procedures outlined by Dickson et al. (2007). Specifically, water samples of 0.5L were transferred from CTD units into borosilicate sample bottles using Tygon tubing. For each profile sampling, two or three duplicate samples were collected, generally at shallow, intermediate and deep parts of the profile. Analysis of the water samples commenced immediately after collection and filtration (0.45  $\mu\text{m}$ ). Analysis of an entire profile was always completed within 2 hours after sampling. The analysis was performed on an Automated Spectrophotometric Alkalinity System (ASAS) following the method outlined by Breland and Byrne (1993) and Yao and Byrne (1998). This optical titration procedure has a remarkable high precision ( $\pm 0.5 \mu\text{mol kg}^{-1}$ ), making it possible to detect minor alkalinity fluctuations. Certified reference material (CRM, Batch #154) obtained from Dr. Andrew Dickson at Scripps Institute of Oceanography (San Diego, California) was used for quality control. The average precision over two weeks of analysis was  $0.5 \mu\text{mol kg}^{-1}$ .

For nutrients and DIC, the seawater samples were collected in 60ml high-density polyethylene syringes with a three way valve from the Niskin bottles of the CTD rosette and the gradient sampler bags. The syringes with a three way valve were first rinsed three times with a small amount of the sample before being completely filled. After sampling on deck, the samples were processed immediately in the lab container. Samples were filtered over a combined 0.8/0.2  $\mu\text{m}$  acrodisc filter and instantly sub-sampled for DIC in a glass vial already containing 15  $\mu\text{l}$  saturated  $\text{HgCl}_2$  (Mercury Chloride) and filled with a round meniscus before being capped and stored upside down in a refrigerator. TA was sub-sample in a high density polyethylene HDPE tube, also known as a pony-vial containing 15  $\mu\text{l}$  saturated  $\text{HgCl}_2$  and stored in the dark at 4°C.

For list of alkalinity measurements conducted on board see appendix 4.4.

#### 4.4 Nutrients (Sharyn Ossebaar)

Nutrients were analysed in a temperature controlled lab container equipped with a QuAAtro Gas Segmented Continuous Flow Analyser, measuring approximately 260 samples during the cruise. Samples were collected from the CTD-Rosette bottles and a Gradient Sampler equipped with 6 sample bags. Measurements were made simultaneously on four channels for Phosphate Ammonium, Nitrite, and Nitrate with Nitrite together. Samples for Silicate, Dissolved Organic Carbon (DIC), Total Alkalinity (TALK) and Total Phosphorous & Total Nitrogen were also taken and will be stored in a refrigerator or freezer until further analysis back at the NIOZ, The Netherlands. All measurements were calibrated with standards diluted in low nutrient seawater (LNSW) in the salinity range of the stations of the Saba Bank waters at approximately 35 ‰ to ensure that analysis remained within the same ionic strength.

Equipment and Methods

**Sample Handling.** The seawater samples were collected in 60ml high-density polyethylene syringes with a three way valve from the Niskin bottles of the CTD rosette and the gradient sampler bags. The syringes with a three way valve were first rinsed three times with a small amount of the sample before being completely filled. After sampling on deck, the samples were processed immediately in the lab container. Samples were filtered over a combined 0.8/0.2µm acrodisc filter and instantly sub-sampled for DIC in a glass vial already containing 15µl saturated HgCl<sub>2</sub> (Mercury Chloride) and filled with a round meniscus before being capped and stored upside down in a refrigerator. Total alkalinity (TAlk) was sub-sample in a high density polyethylene HDPE tube, also known as a pony-vial containing 15µl saturated HgCl<sub>2</sub> and stored in the dark at 4°C. Another pony-vial was filled for PO<sub>4</sub>, NH<sub>4</sub> and NO<sub>3</sub> plus NO<sub>2</sub> for direct analysis on board. Two more pony-vials were filled for storing Silicate in the refrigerator and the other was stored at -20°C for Total Nitrogen & Total Phosphorous analysis. Both these, DIC and TAlk will be analysed back at the NIOZ. All sampling vials including the caps were pre-rinsed three times with filtered sample before being filled. The PO<sub>4</sub>, NH<sub>4</sub> and NO<sub>3</sub> plus NO<sub>2</sub> samples were simultaneously measured in the lab container within 8 hours of sub sampling. Only samples taken from the evening CTD and gradient sampler were refrigerated and analysed the following day, usually within 18 hours of sub-sampling. The on board measured samples were stored in a refrigerator at 4°C and prior to analysis, all samples were brought to lab temperature in about one to two hours. To avoid gas exchange and evaporation during the runs with NH<sub>4</sub> analysis, all vials including the calibration standards were covered with 'parafilm' under tension before being placed into the auto-sampler, so that the sharpened sample needle easily penetrated through the film leaving only a small hole. The QuAAtro uses an LED instead of a lamp as a light source as it is not affected by the movement of the ship giving a stable reading and a sampler rate of 60 samples per hour was used. Calibration standards were diluted from stock solutions of the different nutrients in 0.2µm filtered LNSW diluted with de-ionised water to obtain approximately the same salinity as the samples and were freshly prepared every day. This diluted LNSW was also used as the baseline water for the analysis and in between the samples. The LNSW is surface seawater depleted of most nutrients. Each run of the system had a correlation coefficient of at least 0.9999 for 10 calibration points, but typical 1.0000 for linear chemistry. The samples were measured from the lowest to the highest concentration in order to keep carry-over effects as small as possible, i.e. from surface to deep waters. Concentrations were recorded in 'µmol per liter' (µM/L) at an average container temperature of 23.5°C. During the cruise, a freshly diluted mixed nutrient standard, containing silicate, phosphate and nitrate (a so-called nutrient cocktail), was measured in every run. The cocktail sample was used as a guide to monitor the performance of the standards.

**Analytical Methods.** A brief overview of the colorimetric methods used are as follows:

**Ortho-Phosphate (PO<sub>4</sub>)** reacts with ammonium molybdate at pH 1.0 and potassium antimonyltartrate is used as a catalyst. The yellow phosphate-molybdenum complex is reduced by ascorbic acid and forms a blue reduced molybdophosphate-complex which is measured at 880nm (Murphy & Riley, 1962).

**Ammonium (NH<sub>4</sub>)** reacts with phenol and sodiumhypochlorite at pH 10.5 to form an indo-phenolblue complex. Citrate is used as a buffer and complexant for calcium and magnesium at this pH. The blue colour is measured at 630nm (Koroleff, 1969 and optimized by W. Helder and R. de Vries, 1979).

**Nitrate plus Nitrite (NO<sub>3</sub>+NO<sub>2</sub>)** is mixed with an imidazol buffer at pH 7.5 and reduced by a copperized cadmium column to Nitrite. The Nitrite is diazotated with sulphonylamide and naphthylethylene-diamine to a pink colored complex and measured at 550nm. Nitrate is calculated by subtracting the Nitrite value measured on the Nitrite channel from the 'NO<sub>3</sub>+NO<sub>2</sub>' value. (Grasshoff et al, 1983).

**Nitrite (NO<sub>2</sub>)** is diazotated with sulphonylamide and naphthylethylene-diamine to form a pink colored complex and measured at 550nm. (Grasshoff et al, 1983).

Back at the NIOZ;

**Silicate (Si)** reacts with ammonium molybdate to a yellow complex and after reduction with ascorbic acid, the obtained blue silica-molybdenum complex is measured at 820nm. Oxalic acid is added to prevent formation of the blue phosphate-molybdenum complex (Strickland & Parsons, 1968).

**Dissolved Inorganic Carbon (DIC):** Samples are acidified online after being oxidised by H<sub>2</sub>O<sub>2</sub> to prevent H<sub>2</sub>S being released before entering the silicon dialyser whereby the formed CO<sub>2</sub> is dialysed to a secondary flow. This secondary flow contains a slightly alkaline phenolphthalein solution giving a pink colour. The more CO<sub>2</sub>

that is dialysed, the lower the pH and therefore some discolouration of the pink reagent is observed. This decolouring is measured at 520nm and is an inverse chemistry spectrophotometer method described by Stoll, Bakker, Nobbe and Haesse, 2001.

**Calibration and Standards.** Nutrient primary stock standards were prepared at the NIOZ as follows:

-*Phosphate* ( $\text{PO}_4$ ): by weighing Potassium dihydrogen phosphate in a calibrated volumetric PP flask to make 1mM  $\text{PO}_4$  stock solution.

-*Ammonium* ( $\text{NH}_4$ ): by weighing Ammonium Chloride in a calibrated volumetric PP flask to make 1mM  $\text{NH}_4$  stock solution.

-*Nitrate* ( $\text{NO}_3$ ): by weighing Potassium nitrate in a calibrated volumetric PP flask set to make a 10mM  $\text{NO}_3$  stock solution.

-*Nitrite* ( $\text{NO}_2$ ): by weighing Sodium nitrite in a calibrated volumetric PP flask set to make a 0.5mM  $\text{NO}_2$  stock solution.

-*Silicate*: by weighing  $\text{Na}_2\text{SiF}_6$  in a calibrated volumetric PP flask to 19.84mM Si stock solution.

-*DIC*: by weighing  $\text{Na}_2\text{CO}_3$  stock in a calibrated volumetric PP flask set to make a 200mM stock solution.

All standards were stored at room temperature in a 100% humidified box. The calibration standards were prepared daily by diluting the separate stock standards, using three electronic pipettes, into four 100ml PP volumetric flasks (calibrated at the NIOZ) filled with diluted LNSW. The blank values of the diluted LNSW were measured onboard and added to the calibration values to get the absolute nutrient values.

#### Statistics

**Quality Control.** Our standards are continuously being monitored by participating in inter-calibration exercises organised by external organisations such as ICES and Quasimeme and since 2006, the inter-comparison exercise organised by MRI, Japan.

To gain some accuracy, the NIOZ made a 'Cocktail' standard which contains  $\text{PO}_4$ ,  $\text{NO}_3$  and Si has been monitored since 1997. The following values were obtained from the cocktail which was diluted 250 times in a calibrated PP volumetric flask, being measured in triplicate in every run on board.

|                           | Average value        | S.D.  | N  | Dilution Factor |
|---------------------------|----------------------|-------|----|-----------------|
| $\text{PO}_4$             | 0.912 $\mu\text{M}$  | 0.017 | 65 | 250             |
| $\text{NO}_3+\text{NO}_2$ | 13.813 $\mu\text{M}$ | 0.103 | 65 | 250             |

The cocktail measurements showed that there were no trends observed, thus concluding that the calibration standards were stable during the cruise.

**Mean Detection Limits.** The method detection limit was calculated during the cruise using the standard deviation of ten samples containing 2% of the highest standard used for the calibration curve and multiplied with the student's value for  $n=10$ , thus being 2.82. ( $\text{M.D.L} = \text{Std Dev of 10 samples} \times 2.82$ )

|                           | $\mu\text{M/l}$ | Used measuring ranges $\mu\text{M/l}$ : |
|---------------------------|-----------------|-----------------------------------------|
| $\text{PO}_4$             | 0.004           | 1.505                                   |
| $\text{NH}_4$             | 0.009           | 5.05                                    |
| $\text{NO}_3+\text{NO}_2$ | 0.006           | 20.505                                  |
| $\text{NO}_2$             | 0.003           | 0.500                                   |

**Control sample close to the M.D.L.** As an independent control on near baseline values from in-between analytical runs, LNSW from OSIL batch LNS 21 was measured every day  $n=11$ :

| OSIL batch LNS21 | $\mu\text{M/l}$ | std.dev. $\mu\text{M/l}$ |
|------------------|-----------------|--------------------------|
| $\text{PO}_4$    | 0.012           | 0.006                    |
| $\text{NH}_4$    | 0.071           | 0.014                    |
| $\text{NO}_3$    | 0.019           | 0.018                    |
| $\text{NO}_2$    | 0.058           | 0.045                    |

From the day to day variation no trends over time was observed concluding the baseline water LNSW used was stable during the cruise.

**Precision at different concentration levels.** Standards of three different concentrations were each measured six times to calculate the precision of a specific concentration level. Concentration level in  $\mu\text{M/l}$  with the respective standard deviation of that concentration:

|     | Conc. $\mu\text{M/l}$ | std.dev. | Conc. $\mu\text{M/l}$ | std.dev. | Conc. $\mu\text{M/l}$ | std.dev. |
|-----|-----------------------|----------|-----------------------|----------|-----------------------|----------|
| PO4 | 0.3                   | 0.005    | 0.6                   | 0.003    | 1.0                   | 0.007    |
| NH4 | 0.4                   | 0.07     | 0.8                   | 0.006    | 1.4                   | 0.008    |
| NO3 | 4.0                   | 0.018    | 8                     | 0.040    | 14                    | 0.100    |
| NO2 | 0.1                   | 0.001    | 0.2                   | 0.001    | 0.35                  | 0.001    |

Obtained CRM values

The average value (n=25) of measurements of **CRM "BY"** are:

|         | $\mu\text{M/l}$ | converted to $\mu\text{M/kg}$<br>23°C | assigned KANSO in $\mu\text{M/kg}$ |
|---------|-----------------|---------------------------------------|------------------------------------|
| BY-1000 |                 |                                       |                                    |
| PO4     | 0.043           | 0.042                                 | 0.039*                             |
| NO3     | 0.037           | 0.036                                 | 0.024*                             |
| NO2     | 0.027           | 0.026                                 | 0.019*                             |

\* KANSO : The values for NO3, NO2 and PO4 are below quantifiable detection limit (QDL), thus use these values as a guide

The average value (n=25) of measurements of **CRM "BU"** are:

|         | $\mu\text{M/l}$ | converted to $\mu\text{M/kg}$<br>23°C | assigned KANSO in $\mu\text{M/kg}$ |
|---------|-----------------|---------------------------------------|------------------------------------|
| BU-1756 |                 |                                       |                                    |
| PO4     | 0.355           | 0.346                                 | 0.345                              |
| NO3     | 4.042           | 3.948                                 | 3.937                              |
| NO2     | 0.088           | 0.086                                 | 0.072                              |

The CRM values obtained are in reasonable agreement with the assigned values, therefore no post cruise adjustments are needed.

## References

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### 4.5 Dissolved oxygen dynamics in the benthic boundary layer and microzooplankton (Emil de Borger, Pieter van Rijswijk)

Our goal was to deploy the eddy correlation lander (EDCO, Figure 4.5.1) at several stations characterizing the variety of habitats found on the Saba bank. Simultaneously we would take boxcores on the same locations to incubate and assess oxygen consumption, to extract porewater from sediment depth profiles, and to measure the sediment permeability. We also attached a LISST (Laser In Situ Scattering and Transmissometer) to the CTD. This device measures particle size and particle volumetric amount in the water column.



Figure 4.5.1. Left: Eddy correlation lander on deck; right: unisense oxygen microsensors bent after being hit by debris during a deployment

## EDCO STATIONS



Figure 4.5.2. Variety of locations the EDCO was placed. Upper left; Station 5, Sargassum on calcareous algae; upper right: Station 10, coral reef site surrounded by calcareous algae; lower left: Station 7, sand flat that comprises a considerable part of the Saba Bank; lower right: Station 11, plateau with calcareous algae.

The lander was deployed on stations 4, 5, 6, 7, 10, and 11, with station 8 and 9 skipped due to the heavy swell that could damage sensors during deployment near coral outcrops. These stations offered variable habitats to place the lander (Figure 4.5.2). Placing of the lander was successful in all cases looking at the GoPro images and the pitch-roll-heading data from the ADCP, which remain stable throughout the deployment except for station 7 (during heavy swell) where the lander appears to drift throughout the deployment, and an instantaneous repositioning at station 11. However deploying the EDCO frame in this environment had drawbacks: two sensors were broken during the swell when they were hit by debris (Figure 4.5.1, right), and twice the sensors were covered in mucus, rendering the signal useless.

## BOXCORES

There were trials with the boxcore on station 4 and 5 on places where the hopper transects showed sediment, but these were unsuccessful (see Figure 4.5.3 left). On the bank itself we collected successful sediment cores on station 7, and station 12 (where the EDCO lander was not deployed). Besides this we collected boxcores from the side of the bank at 280 m deep. From station 7 we collected three incubation cores, and three porewater nutrient cores. From station 12 we collected two incubation cores and two porewater nutrient cores. From station 13 we collected 1 incubation core, and two porewater nutrient cores.



Figure 4.5.3. Left: a crushed boxcore container after the failed retrieval of Station 4 sediment; mid: sediment in a 10 cm core from Station 7, which is coarse and seems to contain a mixture of calcareous particles and some type of volcanic rock; right: fine sediment from station 13 (280 m).

Visually the sediments from the bank differed strongly from the station 13 sediment (samples for grain size and porosity taken but not yet analysed). The bank station sediments are a coarse mixture of calcareous sand and what appear to be black volcanic rock particles whereas the sediment from station 13 was finer, and uniform in color (Figure , resp. **Error! Reference source not found.** middle and right). Organism-wise we only found one worm in core 7b, no other fauna. Station 7 had a mean permeability  $4.85 \times 10^{-11} \pm 1.05 \times 10^{-11}$  and station 12 had a mean permeability of  $8.06 \times 10^{-11} \pm 1.11 \times 10^{-11}$ , whereas station 13 can be considered non-permeable using our testing methods (in the  $10^{-15}$  range).

Figure 4.5.4 below shows measured oxygen consumptions for the recovered cores given a certain stirring speed (expressed in % of max stirring speed of 104 rpm). We did this for the advective sediments (stations 7 and 12) to simulate the effects of varying currents on the Saba bank. For the cohesive deep sediment (station 13) this is not necessary. Core 7c was a leaking core from which only the 75% stirring measurement was useable, which happens to also be the measurement that was bypassed in the 7a core incubation series.

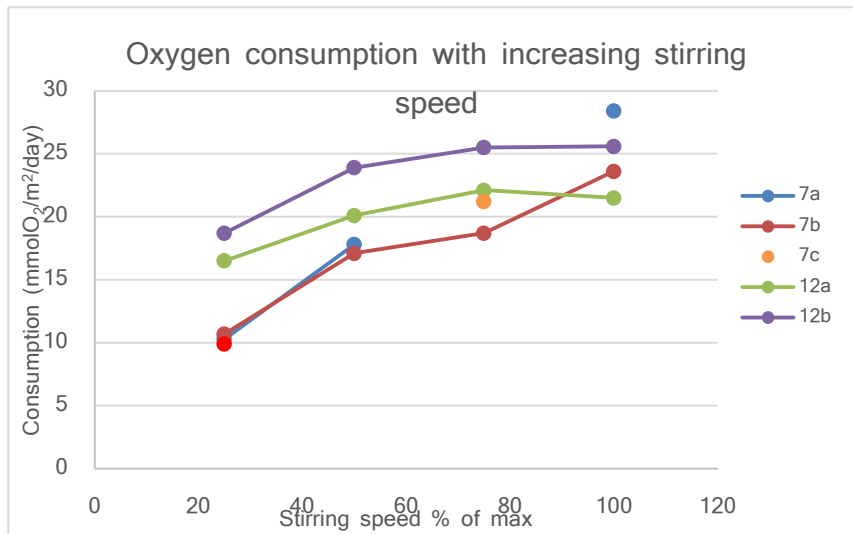


Figure 4.5.4. Oxygen consumption rates from retrieved boxcores on the Saba Bank. X-axis represents the stirring speeds as % of the maximum speed (104 rpm).

## LISST

From the LISST measurements we can conclude that the water column was well mixed during the sampling period, and that there were only a limited number of particles in the water. The LISST classified most measurements as “water is too clear”, as transmission values often exceeded 0.995. Only during the days of heaviest swell (e.g. station 7) did particle mean diameter ( $\mu\text{m}$ ) and particle volumetric abundance (ppm) depth profiles deviate from straight lines, as can be seen in Figure 4.5.5. and Figure 4.5.6. which show measurements from station 7. Near the bottom there is an increase in finer particles (figure 4.5.5 middle), but it seems as if the sediment on the bottom is too heavy to get suspended even during the heavy swell experienced, grain size analysis will confirm whether this is true or not.

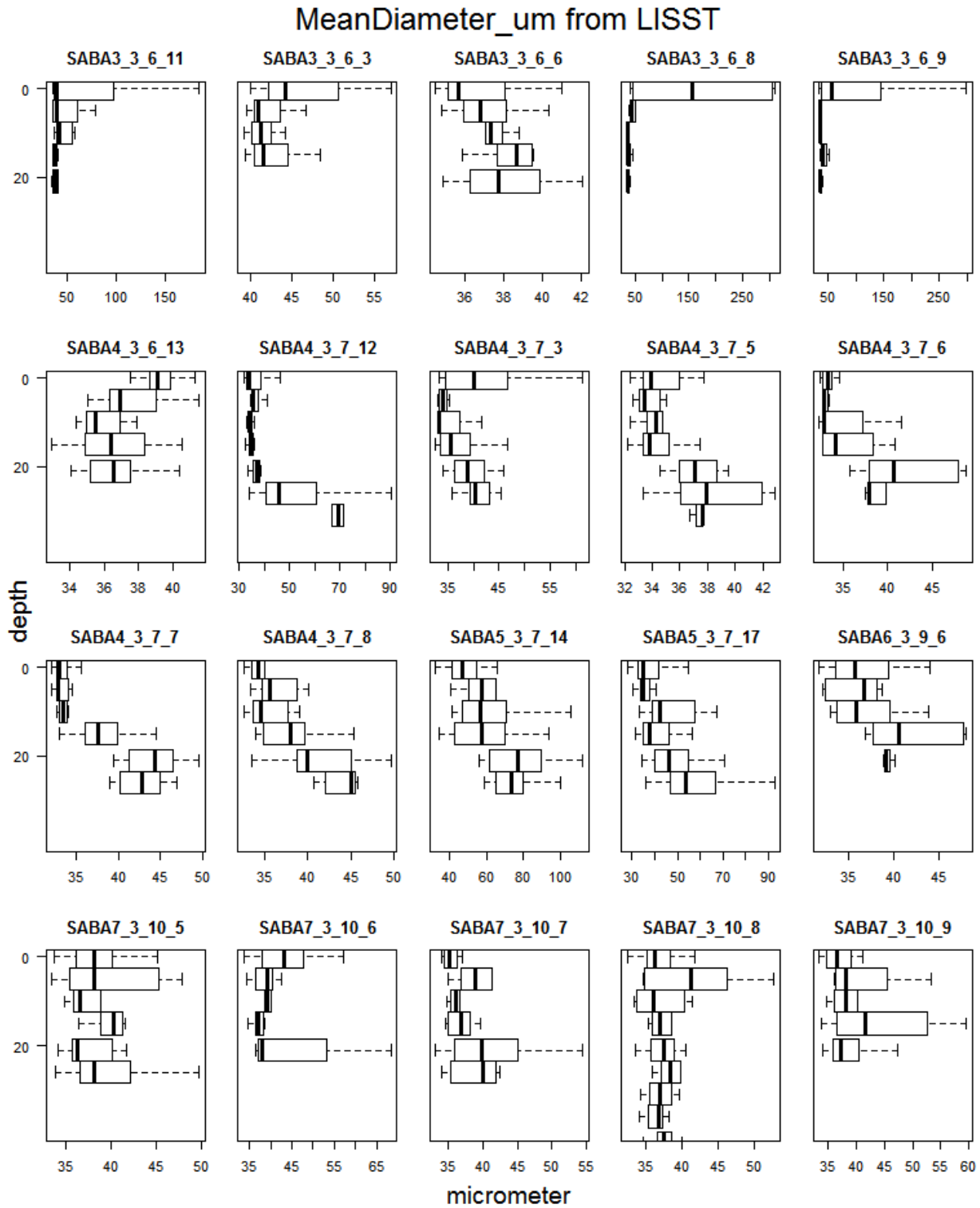


Figure 4.5.5. LISST values for particle diameter ( $\mu\text{m}$ ) of deployments with > 50 % acceptable data points. Data is binned in 5 m depth intervals.

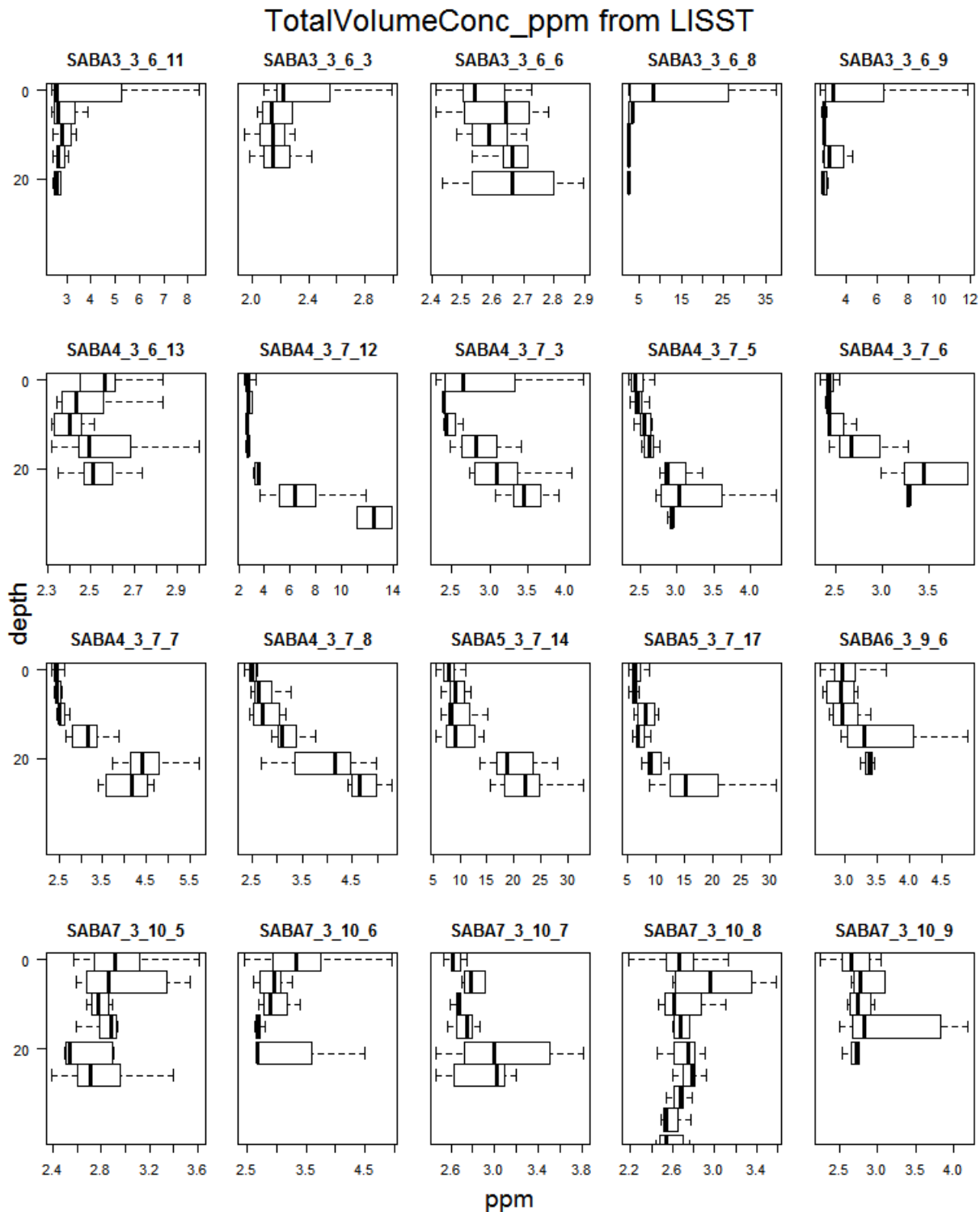


Figure 4.5.6. LISST values for volume concentration (ppm) of deployments with > 50% acceptable data points. Data is binned in 5 m depth intervals.

#### 4.6 Organic matter, pico-, and nanoplankton gradients in reef overlying waters (Fleur van Duyl)

**Aim** of this study is to get more insight in the fluxes of organic matter and inorganic nutrients in the benthic boundary layer in different benthic habitats on the Saba Bank. Little is known about (bio)deposition of organic matter on the bottom in coral reef environments. Concentrations of organic matter in reef

sediments tend to be low. This suggest that the amount of organic matter reaching the bottom is low, and/or is rapidly incorporated by the benthos (microbes and filter/suspension feeders, detritivores) converted into biomass and subsequently mineralized. With the Caribbean wide eutrophication it is assumed that the supply of organic matter to the benthic compartment increased shifting the benthic communities from corals and CCA to more fleshy algae, cyanobacteria and benthic suspension feeders. This study aims to estimate the amount of OM sequestered by different benthic communities on the Saba Bank. Potential sources of OM sampled from surface to bottom were particulate organic matter retained by GF75 filters. Total organic carbon, total nitrogen and total P besides inorganic nutrient samples (see Chap. 4.4). In addition samples were taken for estimations of the abundance of microbes and phytoplankton.

### Approach

The water column was sampled with PUMPY close to the bottom (10-300 cm ab) and above PUMPY with the CTD-rosette. This was done 3 times per day (between approximately 6:00-7:00h, 11:00-13:00h, 17:00-18:00h) at 7 stations (see table 4.6.1.). CTD plus water samples were taken after deployment of PUMPY. At 6 of the 7 stations a replicate PUMPY deployment and CTD profile plus water samples was made of one of the three time slots. There was not always enough water for POM analyses left in the bags of PUMPY to cover all six depths between 10 and 300 cm above the bottom (at least 2 L is required for a measurable signal). PUMPY deployments 7-13, 9-9 and 10-10 had insufficient water for POM samples. The pump system was clogged by resuspended sand due to the high swell. With the CTD, two to three water samples were taken, one at approx. 3 m above the bottom, one inbetween the bottom and the surface and one at the surface (2-5m depth). At shallowest site, Stn 5 (Tertre de Fleur) two water samples were taken.

*Table 4.6.1. Benthic stations sampled with PUMPY on the Saba Bank*

| Station | Casts/PUMPY deployments | Depth PUMPY on bottom (m)   | Benthic Habitat                                                       | Remarks                            |
|---------|-------------------------|-----------------------------|-----------------------------------------------------------------------|------------------------------------|
| 4       | 2, 11, 13, 18           | 25.3-26.8, 23.9, 24.8, 24.2 | Coral reef, Coral Garden site                                         | Aquadopp did not record during 4-2 |
| 5       | 2, 8, 10, 17            | 15.0, 14.8, 14.6, 14.8      | CCA, Sargassum, hard rugose bottom, Tertre de Fleur site              |                                    |
| 6       | 1, 4, 10, 12            | 23.6, 23.5, 24.4, 24.4      | Thin sand layer over hard bottom with Sargassum                       |                                    |
| 7       | 1, 11, 13, 16           | 33.2, 33.3, 33.5, 33.4      | Sandy plain, locally gorgonian attached to rubble/hard bottom outcrop | No POM sampled from 7-13           |
| 9       | 1, 3, 9                 | 26.3, 26.6, 26.8            | High coral cover reef                                                 | No POM sampled from 9-9            |
| 10      | 2, 4, 10, 12            | 27.8, 28.6, 30.6, 27.3      | High coral cover reef                                                 | No POM sampled from 10-10          |
| 11      | 1, 8, 10, 12            | 26.3, 26.5, 26.2, 26.3,     | CCA plate, back reef                                                  |                                    |

Total P (TP, see Chapter 4.4) and microbes (bacteria and phytoplankton) were sampled from all 6 bags of PUMPY. TOC (total organic carbon) and total nitrogen (TOC and TN, see 3.4) were sampled from four of the six bags of PUMPY ( 10, 20, 80, 300 cm ab) and from 2 depths (surface and near bottom) of the CTD rosette sampler. TP and microbes were sampled from the same depths as the POM samples. For samples taken with the CTD see appendix 5.3.

#### Preliminary results:

All hard bottom habitats on the Saba Bank between 15 and 30m depth were net sources of NO<sub>x</sub> (NO<sub>3</sub> + NO<sub>2</sub>). NO<sub>x</sub> concentrations near the bottom were always higher than in surface waters and most of the time increased towards the bottom in the benthic boundary layer. Highest NO<sub>x</sub> concentrations near the bottom were found in live coral communities (Stn 4, 9 and 10) with NO<sub>x</sub> conc. of up to 0.4 μM. CCA dominated stns (stn 5 with 0.02-0.05 and stn 11 with 0.09-0.15 μM) and at the CCA covered with sand and Sargassum (Stn 6) NO<sub>x</sub> conc ranged from 0.012-0.080 μM in the benthic boundary layer. The soft sediment station (Stn 7) was the only station without NO<sub>x</sub> concentration increase from surface to bottom and with PO<sub>4</sub> concentrations exceeding NO<sub>x</sub> concentrations near the bottom.

### 4.7 Exo-metabolomes and metagenomes of coral reefs over a depth gradient (Milou Arts)

#### Introduction

The molecular makeup of marine Dissolved Organic Matter (DOM) remains unknown. Benthic organisms, like coral, sponges and benthic algae which live without or in association with microbes, produce exudates and influence the molecular composition of DOM. The exudates (external metabolic products) serve as food source for marine microbes, which subsequently alter the composition of DOM again. The challenge now is to link metabolomics with the composition of the marine microbe community with metagenomics.

The **aim** of the present study is to gain insight into the composition of DOM and the marine microbe community in the benthic boundary layer water enveloping different benthic communities over the diurnal cycle (night signal versus midday signal) and compare it with surface water on the Saba Bank.

#### Approach

Per day, six water column samples were taken for metabolomics and metagenomics. Three in the morning, representing the “night” samples, and three samples were taken during midday. One sample was taken with the CTD at three-meter depth, the other two with PUMPY at 10cm and 80cm above the bottom (15-28m depth). Seven stations sampled were (4, 5, 6, 7, 9, 10, 11) characterized by different benthic communities. Samples were first filtered for metagenomic analysis with a sterivex, followed by filtering for metabolomic analysis with a bond elute filter which had been prepared with some washing steps. DOC samples were taken in between the two filtration steps and twice after the last filtration step. Once at the beginning of the filter step (after 100-200 mL) and if possible at the end of the filtration. Metabolomic samples will be analyzed with high-Resolution Liquid Chromatography-Tandem Mass Spectrometry (LC-MS/MS), which allows molecular characterization (molecular fingerprint) of DOM on a large scale. This way the composition of dissolved organic matter in different layers above the benthos and at different times in the daily light cycle will be analyzed.

### 4.8 Nutrient, phytoplankton and virus measurements along Saba Bank (NICO students Tom Theirlynck & Lucas Tichy)

#### Aim

The research aim was to measure the nutrient concentrations and abundance of phytoplankton and viruses throughout the water column for different sites along Saba Bank. Two CTD's were taken per week. First, samples were taken at the fixed depths 3, 15 and 200 meters. The rest of the sampled depths were centered around the Deep Chlorophyll Maximum, or DCM in short. These were summed up in three depths: the upper DCM, the DCM peak and the DCM bottom.

An overview of the sampled stations and depths is displayed in Table 4.8.1. Four stations were sampled in total: two deep stations with a bottom depth ranging from 230 to 330 meters and two shallow station with a bottom depth of 25 meters approximately. For the deep stations samples were taken at all described depths, however in the case of shallow stations the bottom depth only allowed sampling at 3 and 15 meters.

Table 4.8.1: Overview of the sampled stations and depths for NICO Leg 6. The date, station number, cast number and depth are shown. Four stations were sampled in total.

| Date      | Station | Cast | Depths                                                          |
|-----------|---------|------|-----------------------------------------------------------------|
| 27-2-2018 | 3       | 1    | 3m , 15m, 40m (upper DCM), 60m (DCM), 140 m (bottom DCM), 200 m |
| 3-3-2018  | 6       | 3    | 3 m, 15 m                                                       |
| 5-3-2018  | 8       | 1    | 3m , 15m, 70m (upper DCM), 80m (DCM), 130 m (bottom DCM), 200 m |
| 7-3-2018  | 10      | 11   | 3 m, 15 m                                                       |

### Overview of the sampled variables.

The type of analysis for each depth is shown in Table 4.8.2. In summary, phytoplankton/virus abundance samples were taken at every different depth. Molecular samples were taken at 15 meters and the DCM peak. Lastly, nutrient, HPLC, POC and DMSP samples were taken at 3 m, 15 m and the DCM peak respectively. Samples for the purpose of PAM measurements were not sampled individually but rather sampled out of the 5 L HPLC sample bottles. In all cases a separate CTD Niskin bottle was reserved for the DMSP, HPLC and POC samples as well as a separate Niskin bottle for molecular, nutrient and abundance samples. All samples were stored in the dark before processing and molecular samples were stored on ice as well.

Table 4.8.2: Type of conducted analyses from CTD samples. The sampling depth is displayed and the presence and volume of each type of variable is indicated per depth category. Variables are listed from left to right in the order of sampling from the CTD bottles.

| Depth      | DMSP      | Molecular | Flowcytometry | Nutrients | HPLC | POC |
|------------|-----------|-----------|---------------|-----------|------|-----|
| 3 m        | 2 x 70 mL |           | 50 mL         | 50mL      | 2 L  | 5 L |
| 15 m       | 2 x 70 mL | 5 L       | 50 mL         | 50 mL     | 2 L  | 5 L |
| DCM upper  |           |           | 50 mL         |           |      |     |
| DCM peak   | 2 x 70 mL | 5 L       | 50 mL         | 50 mL     | 2 L  | 5 L |
| DCM bottom |           |           | 50 mL         |           |      |     |
| 200 m      |           |           | 50 mL         |           |      |     |

### Brief summary sample processing

The methods for processing the taken samples are shortly summarized below. They are listed in order of execution:

First, **DMSP** samples were prepared. Two types of samples were taken: 10 mL of untreated sample and 10 mL of filtrate. The filtrate sample was prepared by pouring roughly 60 mL of water over a 4.5 cm glass-fiber filter and collecting 10 mL after about 15 mL had been filtered. A new filter was used for each depth and the filtration unit was cleaned in between samples. A volume of 50 µL of D3-P standard was added followed by 1 pellet of NaOH and both samples were stored at -20 degrees in the freezer.

**Molecular work** involved filtration of sampled seawater by two filters: a 0,2 µm filter for phytoplankton and a 0,02 µm filter for filtering for viruses. Around 2 liters of water were filtered for acquiring phytoplankton opposed to around 1,1 liters for viruses. Sterivex (phytoplankton) and Anotop (viruses) filters were snapfrozen and stored in the -80 freezer.

The **abundance sampling for flow cytometry** was performed as follows: fixatives were added to respectively 3.5 mL water sample for fixing phytoplankton and 1 mL water sample for viruses and bacteria. A volume of 100 µL of formaldehyde (18%v/v)/hexamine (10%w/v) solution was added for fixing phytoplankton and 20 µL of glutaraldehyde solution was added for fixing viruses and bacteria. Cryovials were left for fixation at 4 °C for 15-30 minutes, snap frozen and put in the -80 freezer.

To measure the relative photosynthetic activity, **PAM measurements** were performed using a Walz PAM fluorometer. Sampled water from respective depths was pipetted in a 3 mL vial and left in the dark for 10 minutes. Consecutively, vials were placed in the PAM meter where the PM and Out- gain were adjusted till the Ft-value approached 400-800 approximately. Auto Zero was set as a standard with a reference of filtered sea water. Lastly, samples were put in the dark and measured after one minute. The yield and gain value was noted.

**Inorganic nutrients** samples were prepared for analysis by filtering sampled seawater with use of a non-sterile acrodisc filter syringe with a 0,2µm pore size. Two 2 ml Ponyvials were filled per depth: one vial for Silica and one vial for Nitrogen and Phosphor. The acrodisc syringe was rinsed in between different samples and vials were rinsed with the filtrate three times. Silica samples were stored at 4 °C and Nitrogen and Phosphor samples at -20 °C.

**HPLC and POC samples** were taken by filtering water over 4.7 cm and 2.5 cm GF/F filters respectively. A vacuum pump was used to maintain an under-pressure of 0.20 bar during filtration. Volumes of 4 liters were filtered for HPLC and 2 liters for POC. Filters were snap frozen, wrapped in Aluminum foil, frozen again in liquid N<sub>2</sub> and stored at -20 in the case of POC and -80 in the case of HPLC.

## 5 Appendix

### 5.1 Overview activities

| Date     | Heure    | Latitude  | Longitude  | Device name      | Action name | Action code | Operation Id       | Observation | Station number | Depth (m) |
|----------|----------|-----------|------------|------------------|-------------|-------------|--------------------|-------------|----------------|-----------|
| 02-26-18 | 21:25:21 | 17,662445 | -63,241554 | CTD              | Begin       | BEGIN       | NICO_Leg 6CTD1     |             | 1_1            | 312,5     |
| 02-26-18 | 21:36:35 | 17,662586 | -63,241494 | CTD              | Bottom      | BOT         | NICO_Leg 6CTD1     |             | 1_1            | 318,74    |
| 02-26-18 | 21:44:30 | 17,66266  | -63,241312 | CTD              | End         | END         | NICO_Leg 6CTD1     |             | 1_1            | 322,64    |
| 02-26-18 | 22:37:14 | 17,62789  | -63,273366 | Hopper Camera    | Begin       | BEGIN       | NICO_Leg 6HOPCAM1  |             | 201            | 77,35     |
| 02-26-18 | 23:26:18 | 17,634167 | -63,272616 | Hopper Camera    | Start track | START       | NICO_Leg 6HOPCAM1  |             | 201            | 110,36    |
| 02-26-18 | 23:26:21 | 17,634176 | -63,272621 | Hopper Camera    | End track   | END TRACK   | NICO_Leg 6HOPCAM1  |             | 201            | 103,3     |
| 02-26-18 | 23:29:37 | 17,633997 | -63,272283 | Hopper Camera    | End         | END         | NICO_Leg 6HOPCAM1  |             | 201            | 101,73    |
| 02-27-18 | 0:26:01  | 17,608475 | -63,237697 | Hopper Camera    | Begin       | BEGIN       | NICO_Leg 6HOPCAM2  |             | 202            | 83,65     |
| 02-27-18 | 0:30:27  | 17,608792 | -63,238754 | Hopper Camera    | Start track | START       | NICO_Leg 6HOPCAM2  |             | 202            | 78,92     |
| 02-27-18 | 0:40:03  | 17,610483 | -63,238926 | Hopper Camera    | End track   | END TRACK   | NICO_Leg 6HOPCAM2  |             | 202            | 27,09     |
| 02-27-18 | 0:43:34  | 17,610462 | -63,238881 | Hopper Camera    | End         | END         | NICO_Leg 6HOPCAM2  |             | 202            | 28,85     |
| 02-27-18 | 1:04:24  | 17,62311  | -63,216167 | Hopper Camera    | Begin       | BEGIN       | NICO_Leg 6HOPCAM3  |             | 203            | 112,72    |
| 02-27-18 | 1:06:59  | 17,623221 | -63,216746 | Hopper Camera    | Start track | START       | NICO_Leg 6HOPCAM3  |             | 203            | 87,58     |
| 02-27-18 | 1:16:02  | 17,623016 | -63,218443 | Hopper Camera    | End track   | END TRACK   | NICO_Leg 6HOPCAM3  |             | 203            | 37,13     |
| 02-27-18 | 1:19:50  | 17,622734 | -63,219034 | Hopper Camera    | End         | END         | NICO_Leg 6HOPCAM3  |             | 203            | 29,95     |
| 02-27-18 | 11:07:25 | 17,555227 | -62,979591 | CTD              | Begin       | BEGIN       | NICO_Leg 6CTD2     |             | 2_1            | 289,38    |
| 02-27-18 | 11:16:35 | 17,555356 | -62,979866 | CTD              | Bottom      | BOT         | NICO_Leg 6CTD2     |             | 2_1            | 302,53    |
| 02-27-18 | 11:24:54 | 17,555617 | -62,979898 | CTD              | End         | END         | NICO_Leg 6CTD2     |             | 2_1            | 318       |
| 02-27-18 | 11:53:52 | 17,519088 | -62,97943  | Hopper Camera    | Begin       | BEGIN       | NICO_Leg 6HOPCAM4  |             | 204            | 27,66     |
| 02-27-18 | 11:58:54 | 17,519088 | -62,979373 | Hopper Camera    | Start track | START       | NICO_Leg 6HOPCAM4  |             | 204            | 27,6      |
| 02-27-18 | 12:09:48 | 17,519104 | -62,978008 | Hopper Camera    | End track   | END TRACK   | NICO_Leg 6HOPCAM4  |             | 204            | 30,03     |
| 02-27-18 | 12:13:47 | 17,518915 | -62,977504 | Hopper Camera    | End         | END         | NICO_Leg 6HOPCAM4  |             | 204            | 30,82     |
| 02-27-18 | 12:43:15 | 17,504886 | -62,940315 | Hopper Camera    | Begin       | BEGIN       | NICO_Leg 6HOPCAM5  |             | 205            | 62,38     |
| 02-27-18 | 12:46:11 | 17,505249 | -62,940012 | Hopper Camera    | Start track | START       | NICO_Leg 6HOPCAM5  |             | 205            | 90,36     |
| 02-27-18 | 13:19:31 | 17,500665 | -62,945822 | Hopper Camera    | End track   | END TRACK   | NICO_Leg 6HOPCAM5  |             | 205            | 33,96     |
| 02-27-18 | 13:20:54 | 17,500558 | -62,94609  | Hopper Camera    | End         | END         | NICO_Leg 6HOPCAM5  |             | 205            | 33,95     |
| 02-27-18 | 13:53:05 | 17,460974 | -62,94752  | Hopper Camera    | Begin       | BEGIN       | NICO_Leg 6HOPCAM6  |             | 206            | 34,46     |
| 02-27-18 | 13:53:36 | 17,460949 | -62,947631 | Hopper Camera    | Start track | START       | NICO_Leg 6HOPCAM6  |             | 206            | 33,68     |
| 02-27-18 | 14:38:47 | 17,452818 | -62,957365 | Hopper Camera    | End track   | END TRACK   | NICO_Leg 6HOPCAM6  |             | 206            | 45,84     |
| 02-27-18 | 14:41:36 | 17,452102 | -62,957795 | Hopper Camera    | End         | END         | NICO_Leg 6HOPCAM6  |             | 206            | 47,82     |
| 02-27-18 | 15:05:40 | 17,443712 | -62,984024 | Hopper Camera    | Begin       | BEGIN       | NICO_Leg 6HOPCAM7  |             | 207            | 75,77     |
| 02-27-18 | 15:08:11 | 17,443771 | -62,983887 | Hopper Camera    | Start track | START       | NICO_Leg 6HOPCAM7  |             | 207            | 72,62     |
| 02-27-18 | 15:26:46 | 17,446558 | -62,983631 | Hopper Camera    | End track   | END TRACK   | NICO_Leg 6HOPCAM7  |             | 207            | 56,85     |
| 02-27-18 | 15:28:44 | 17,44689  | -62,983604 | Hopper Camera    | End         | END         | NICO_Leg 6HOPCAM7  |             | 207            | 56,14     |
| 02-27-18 | 15:48:31 | 17,456823 | -62,990375 | Hopper Camera    | Begin       | BEGIN       | NICO_Leg 6HOPCAM8  |             | 208            | 72,62     |
| 02-27-18 | 15:51:09 | 17,45706  | -62,990371 | Hopper Camera    | Start track | START       | NICO_Leg 6HOPCAM8  |             | 208            | 64,74     |
| 02-27-18 | 16:17:18 | 17,461314 | -62,990105 | Hopper Camera    | End track   | END TRACK   | NICO_Leg 6HOPCAM8  |             | 208            | 27,25     |
| 02-27-18 | 16:23:54 | 17,459543 | -62,990385 | Hopper Camera    | End         | END         | NICO_Leg 6HOPCAM8  |             | 208            | 49,75     |
| 02-27-18 | 17:20:31 | 17,509358 | -63,032422 | Hopper Camera    | Begin       | BEGIN       | NICO_Leg 6HOPCAM9  |             | 209            | 57,64     |
| 02-27-18 | 17:23:53 | 17,509692 | -63,032063 | Hopper Camera    | Start track | START       | NICO_Leg 6HOPCAM9  |             | 209            | 58,43     |
| 02-27-18 | 17:39:25 | 17,512018 | -63,032112 | Hopper Camera    | End track   | END TRACK   | NICO_Leg 6HOPCAM9  |             | 209            | 48,84     |
| 02-27-18 | 17:44:20 | 17,512965 | -63,032339 | Hopper Camera    | End         | END         | NICO_Leg 6HOPCAM9  |             | 209            | 53,7      |
| 02-27-18 | 20:53:58 | 17,260253 | -63,381971 | CTD with samples | Begin       | BEGIN       | NICO_Leg 6CTDBOT1  |             | 3_1            | 331,8     |
| 02-27-18 | 21:03:24 | 17,260337 | -63,382033 | CTD with samples | Bottom      | BOT         | NICO_Leg 6CTDBOT1  |             | 3_1            | 330,79    |
| 02-27-18 | 21:22:47 | 17,260361 | -63,381766 | CTD with samples | End         | END         | NICO_Leg 6CTDBOT1  |             | 3_1            | 329,44    |
| 02-27-18 | 22:38:05 | 17,337598 | -63,289422 | Hopper Camera    | Begin       | BEGIN       | NICO_Leg 6HOPCAM10 |             | 210            | 17,24     |
| 02-27-18 | 22:39:47 | 17,337567 | -63,289354 | Hopper Camera    | Start track | START       | NICO_Leg 6HOPCAM10 |             | 210            | 21,95     |
| 02-27-18 | 23:29:07 | 17,344507 | -63,287861 | Hopper Camera    | End track   | END TRACK   | NICO_Leg 6HOPCAM10 |             | 210            | 21,25     |
| 02-27-18 | 23:32:13 | 17,344593 | -63,28807  | Hopper Camera    | End         | END         | NICO_Leg 6HOPCAM10 |             | 210            | 20,95     |
| 02-28-18 | 11:33:50 | 17,344799 | -63,249673 | Hopper Camera    | Begin       | BEGIN       | NICO_Leg 6HOPCAM11 |             | 211            | 80,5      |
| 02-28-18 | 11:36:50 | 17,344939 | -63,249775 | Hopper Camera    | Start track | START       | NICO_Leg 6HOPCAM11 |             | 211            | 0         |
| 02-28-18 | 13:15:38 | 17,349953 | -63,25031  | Hopper Camera    | End track   | END TRACK   | NICO_Leg 6HOPCAM11 |             | 211            | 22,93     |
| 02-28-18 | 13:18:13 | 17,350362 | -63,250794 | Hopper Camera    | End         | END         | NICO_Leg 6HOPCAM11 |             | 211            | 22,83     |
| 02-28-18 | 13:58:14 | 17,333612 | -63,253077 | Hopper Camera    | Begin       | BEGIN       | NICO_Leg 6HOPCAM12 |             | 212            | 85,22     |
| 02-28-18 | 13:59:45 | 17,333608 | -63,253122 | Hopper Camera    | Start track | START       | NICO_Leg 6HOPCAM12 |             | 212            | 82,86     |
| 02-28-18 | 14:32:47 | 17,333855 | -63,257912 | Hopper Camera    | End track   | END TRACK   | NICO_Leg 6HOPCAM12 |             | 212            | 18,2      |
| 02-28-18 | 14:35:40 | 17,333893 | -63,25829  | Hopper Camera    | End         | END         | NICO_Leg 6HOPCAM12 |             | 212            | 17,79     |
| 02-28-18 | 15:10:20 | 17,333775 | -63,256195 | Mooring          | Deployment  | DEP         | NICO_Leg 6MOOR1    | EDCO        | 4_1            | 32,4      |
| 02-28-18 | 15:41:45 | 17,333835 | -63,254181 | Mooring          | Deployment  | DEP         | NICO_Leg 6MOOR2    | Pumpy       | 4_2            | 25,29     |
| 02-28-18 | 17:16:41 | 17,333498 | -63,254064 | CTD with samples | Begin       | BEGIN       | NICO_Leg 6CTDBOT2  |             | 4_3            | 32,09     |
| 02-28-18 | 17:19:54 | 17,333587 | -63,254038 | CTD with samples | Bottom      | BOT         | NICO_Leg 6CTDBOT2  |             | 4_3            | 31,98     |

| Date     | Heure    | Latitude  | Longitude  | Device name      | Action name | Action code | Operation Id       | Observation | Station number | Depth (m) |
|----------|----------|-----------|------------|------------------|-------------|-------------|--------------------|-------------|----------------|-----------|
| 02-28-18 | 17:31:11 | 17,33362  | -63,254043 | CTD with samples | End         | END         | NICO_Leg 6CTDBOT2  |             | 4_3            | 31,49     |
| 02-28-18 | 17:54:27 | 17,333941 | -63,254117 | Mooring          | Recovery    | REC         | NICO_Leg 6MOOR2    | Pumpy       | 4_2            | 26,77     |
| 02-28-18 | 18:10:58 | 17,333727 | -63,254278 | CTD              | Begin       | BEGIN       | NICO_Leg 6CTD3     |             | 4_4            | 24,48     |
| 02-28-18 | 18:15:10 | 17,333771 | -63,254284 | CTD              | Bottom      | BOT         | NICO_Leg 6CTD3     |             | 4_4            | 24,5      |
| 02-28-18 | 18:18:51 | 17,333774 | -63,254362 | CTD              | End         | END         | NICO_Leg 6CTD3     |             | 4_4            | 24,2      |
| 02-28-18 | 18:31:25 | 17,335839 | -63,256201 | CTD              | Begin       | BEGIN       | NICO_Leg 6CTD4     |             | 4_5            | 35,55     |
| 02-28-18 | 18:35:15 | 17,335794 | -63,256144 | CTD              | Bottom      | BOT         | NICO_Leg 6CTD4     |             | 4_5            | 34,76     |
| 02-28-18 | 18:37:17 | 17,335763 | -63,25617  | CTD              | End         | END         | NICO_Leg 6CTD4     |             | 4_5            | 34,76     |
| 02-28-18 | 18:52:24 | 17,332144 | -63,256178 | CTD              | Begin       | BEGIN       | NICO_Leg 6CTD5     |             | 4_6            | 22,13     |
| 02-28-18 | 18:55:27 | 17,332157 | -63,256136 | CTD              | Bottom      | BOT         | NICO_Leg 6CTD5     |             | 4_6            | 22,93     |
| 02-28-18 | 18:57:16 | 17,332119 | -63,256129 | CTD              | End         | END         | NICO_Leg 6CTD5     |             | 4_6            | 22,14     |
| 02-28-18 | 19:16:18 | 17,333819 | -63,258179 | CTD              | Begin       | BEGIN       | NICO_Leg 6CTD6     |             | 4_7            | 17,58     |
| 02-28-18 | 19:18:57 | 17,333812 | -63,258148 | CTD              | Bottom      | BOT         | NICO_Leg 6CTD6     |             | 4_7            | 16,31     |
| 02-28-18 | 19:20:58 | 17,33379  | -63,258155 | CTD              | End         | END         | NICO_Leg 6CTD6     |             | 4_7            | 16,42     |
| 02-28-18 | 19:43:11 | 17,334024 | -63,254238 | Vertical Net     | Begin       | BEGIN       | NICO_Leg 6WP501    |             | 4_8            | 24,36     |
| 02-28-18 | 19:43:14 | 17,334021 | -63,254238 | Vertical Net     | Start Heave | HEAV        | NICO_Leg 6WP501    |             | 4_8            | 24,95     |
| 02-28-18 | 19:45:44 | 17,334008 | -63,254225 | Vertical Net     | End         | END         | NICO_Leg 6WP501    |             | 4_8            | 25,3      |
| 02-28-18 | 19:48:54 | 17,334005 | -63,254238 | Vertical Net     | Begin       | BEGIN       | NICO_Leg 6WP502    |             | 4_9            | 24,89     |
| 02-28-18 | 19:52:24 | 17,333942 | -63,254286 | Vertical Net     | Start Heave | HEAV        | NICO_Leg 6WP502    |             | 4_9            | 24,92     |
| 02-28-18 | 19:58:08 | 17,333911 | -63,254302 | Vertical Net     | End         | END         | NICO_Leg 6WP502    |             | 4_9            | 26,09     |
| 02-28-18 | 19:58:23 | 17,333915 | -63,254305 | Vertical Net     | Begin       | BEGIN       | NICO_Leg 6WP503    |             | 4_10           | 24,5      |
| 02-28-18 | 20:01:02 | 17,333906 | -63,254348 | Vertical Net     | Start Heave | HEAV        | NICO_Leg 6WP503    |             | 4_10           | 25,3      |
| 02-28-18 | 20:06:01 | 17,333896 | -63,254314 | Vertical Net     | End         | END         | NICO_Leg 6WP503    |             | 4_10           | 25,3      |
| 02-28-18 | 20:24:40 | 17,333776 | -63,254089 | Mooring          | Deployment  | DEP         | NICO_Leg 6MOOR3    | Pumpy       | 4_11           | 28,94     |
| 02-28-18 | 20:54:08 | 17,33338  | -63,254082 | CTD with samples | Begin       | BEGIN       | NICO_Leg 6CTDBOT3  |             | 4_12           | 32,99     |
| 02-28-18 | 20:57:36 | 17,33335  | -63,254049 | CTD with samples | Bottom      | BOT         | NICO_Leg 6CTDBOT3  |             | 4_12           | 35,55     |
| 02-28-18 | 21:05:46 | 17,333415 | -63,254043 | CTD with samples | End         | END         | NICO_Leg 6CTDBOT3  |             | 4_12           | 34,41     |
| 02-28-18 | 22:38:22 | 17,333835 | -63,254221 | Mooring          | Recovery    | REC         | NICO_Leg 6MOOR3    | Pumpy       | 4_11           | 24,32     |
| 03-01-18 | 10:03:18 | 17,333711 | -63,254076 | Mooring          | Deployment  | DEP         | NICO_Leg 6MOOR4    | Pumpy       | 4_13           | 29,24     |
| 03-01-18 | 10:30:12 | 17,333288 | -63,253954 | CTD with samples | Begin       | BEGIN       | NICO_Leg 6CTDBOT4  |             | 4_14           | 41,07     |
| 03-01-18 | 10:32:31 | 17,33331  | -63,25405  | CTD with samples | Bottom      | BOT         | NICO_Leg 6CTDBOT4  |             | 4_14           | 34,67     |
| 03-01-18 | 10:41:00 | 17,333365 | -63,25406  | CTD with samples | End         | END         | NICO_Leg 6CTDBOT4  |             | 4_14           | 33,19     |
| 03-01-18 | 11:05:03 | 17,333708 | -63,249453 | CTD with samples | Begin       | BEGIN       | NICO_Leg 6CTDBOT5  |             | 4_15           | 245,78    |
| 03-01-18 | 11:12:25 | 17,333742 | -63,249466 | CTD with samples | Bottom      | BOT         | NICO_Leg 6CTDBOT5  |             | 4_15           | 244,77    |
| 03-01-18 | 11:28:36 | 17,333714 | -63,249483 | CTD with samples | End         | END         | NICO_Leg 6CTDBOT5  |             | 4_15           | 244,52    |
| 03-01-18 | 12:04:14 | 17,333597 | -63,254066 | Mooring          | Recovery    | REC         | NICO_Leg 6MOOR4    | Pumpy       | 4_13           | 29,82     |
| 03-01-18 | 14:22:33 | 17,33506  | -63,256109 | Boxcore          | Bottom      | BOT         | NICO_Leg 6BOX1251  |             | 4_16           | 33,14     |
| 03-01-18 | 14:55:59 | 17,332762 | -63,255893 | Boxcore          | Bottom      | BOT         | NICO_Leg 6BOX1252  |             | 4_17           | 21,35     |
| 03-01-18 | 15:30:47 | 17,333864 | -63,256178 | Mooring          | Recovery    | REC         | NICO_Leg 6MOOR4    | EDCO        | 4_1            | 32,57     |
| 03-01-18 | 15:54:01 | 17,333798 | -63,254069 | Mooring          | Deployment  | DEP         | NICO_Leg 6MOOR5    | Pumpy       | 4_18           | 29,24     |
| 03-01-18 | 17:13:44 | 17,333167 | -63,254158 | CTD with samples | Begin       | BEGIN       | NICO_Leg 6CTDBOT6  |             | 4_19           | 32,02     |
| 03-01-18 | 17:17:21 | 17,3332   | -63,254198 | CTD with samples | Bottom      | BOT         | NICO_Leg 6CTDBOT6  |             | 4_19           | 30,78     |
| 03-01-18 | 17:25:20 | 17,333195 | -63,254357 | CTD with samples | End         | END         | NICO_Leg 6CTDBOT6  |             | 4_19           | 25,3      |
| 03-01-18 | 17:53:29 | 17,333839 | -63,254145 | Mooring          | Recovery    | REC         | NICO_Leg 6MOOR5    | Pumpy       | 4_18           | 27,34     |
| 03-01-18 | 19:05:27 | 17,379046 | -63,292709 | Hopper Camera    | Begin       | BEGIN       | NICO_Leg 6HOPCAM13 |             | 213            | 22,55     |
| 03-01-18 | 19:07:03 | 17,379086 | -63,292765 | Hopper Camera    | Start track | START       | NICO_Leg 6HOPCAM13 |             | 213            | 22,93     |
| 03-01-18 | 20:06:32 | 17,38371  | -63,290563 | Hopper Camera    | End track   | END TRACK   | NICO_Leg 6HOPCAM13 |             | 213            | 15,55     |
| 03-01-18 | 20:12:42 | 17,383934 | -63,290702 | Hopper Camera    | End         | END         | NICO_Leg 6HOPCAM13 |             | 213            | 15,31     |
| 03-01-18 | 20:29:51 | 17,383091 | -63,290447 | Mooring          | Deployment  | DEP         | NICO_Leg 6MOOR6    | EDCO        | 5_1            | 16,62     |
| 03-01-18 | 21:03:17 | 17,383896 | -63,290476 | Mooring          | Deployment  | DEP         | NICO_Leg 6MOOR7    | Pumpy       | 5_2            | 15,6      |
| 03-01-18 | 21:24:59 | 17,384283 | -63,2906   | CTD with samples | Begin       | BEGIN       | NICO_Leg 6CTDBOT7  |             | 5_3            | 16,62     |
| 03-01-18 | 21:26:10 | 17,38428  | -63,290667 | CTD with samples | Bottom      | BOT         | NICO_Leg 6CTDBOT7  |             | 5_3            | 15,6      |
| 03-01-18 | 21:32:33 | 17,384162 | -63,290652 | CTD with samples | End         | END         | NICO_Leg 6CTDBOT7  |             | 5_3            | 16,62     |
| 03-01-18 | 22:40:34 | 17,383962 | -63,290417 | Mooring          | Recovery    | REC         | NICO_Leg 6MOOR7    | Pumpy       | 5_2            | 11,79     |
| 03-01-18 | 22:54:31 | 17,385019 | -63,290431 | CTD              | Begin       | BEGIN       | NICO_Leg 6CTD7     |             | 5_4            | 21,28     |
| 03-01-18 | 22:56:55 | 17,384962 | -63,290403 | CTD              | Bottom      | BOT         | NICO_Leg 6CTD7     |             | 5_4            | 21,3      |
| 03-01-18 | 23:02:39 | 17,383511 | -63,288991 | CTD              | End         | END         | NICO_Leg 6CTD7     |             | 5_4            | 19,46     |
| 03-01-18 | 23:07:42 | 17,383038 | -63,288547 | CTD              | Begin       | BEGIN       | NICO_Leg 6CTD8     |             | 5_5            | 21,33     |
| 03-01-18 | 23:10:14 | 17,383002 | -63,288583 | CTD              | Bottom      | BOT         | NICO_Leg 6CTD8     |             | 5_5            | 21,3      |
| 03-01-18 | 23:12:20 | 17,383094 | -63,288676 | CTD              | End         | END         | NICO_Leg 6CTD8     |             | 5_5            | 22,14     |
| 03-01-18 | 23:23:20 | 17,381256 | -63,290501 | CTD              | Begin       | BEGIN       | NICO_Leg 6CTD9     |             | 5_6            | 16,61     |
| 03-01-18 | 23:26:18 | 17,381219 | -63,290483 | CTD              | Bottom      | BOT         | NICO_Leg 6CTD9     |             | 5_6            | 16,61     |
| 03-01-18 | 23:28:04 | 17,381239 | -63,290457 | CTD              | End         | END         | NICO_Leg 6CTD9     |             | 5_6            | 16,53     |
| 03-01-18 | 23:37:46 | 17,383053 | -63,29234  | CTD              | Begin       | BEGIN       | NICO_Leg 6CTD10    |             | 5_7            | 16,95     |
| 03-01-18 | 23:40:57 | 17,383101 | -63,292406 | CTD              | Bottom      | BOT         | NICO_Leg 6CTD10    |             | 5_7            | 16,58     |
| 03-01-18 | 23:42:39 | 17,383078 | -63,292405 | CTD              | End         | END         | NICO_Leg 6CTD10    |             | 5_7            | 16,5      |
| 03-02-18 | 10:09:46 | 17,383883 | -63,290417 | Mooring          | Deployment  | DEP         | NICO_Leg 6MOOR8    | Pumpy       | 5_8            | 15,18     |
| 03-02-18 | 10:29:24 | 17,383683 | -63,290941 | CTD with samples | Begin       | BEGIN       | NICO_Leg 6CTDBOT8  |             | 5_9            | 16        |
| 03-02-18 | 10:32:29 | 17,383689 | -63,290869 | CTD with samples | Bottom      | BOT         | NICO_Leg 6CTDBOT8  |             | 5_9            | 15,98     |
| 03-02-18 | 10:37:53 | 17,383641 | -63,291027 | CTD with samples | End         | END         | NICO_Leg 6CTDBOT8  |             | 5_9            | 16,29     |
| 03-02-18 | 11:37:19 | 17,383779 | -63,290422 | Mooring          | Recovery    | REC         | NICO_Leg 6MOOR8    | Pumpy       | 5_8            | 15,83     |

| Date     | Heure    | Latitude  | Longitude  | Device name      | Action name | Action code | Operation Id       | Observation | Station number | Depth (m) |
|----------|----------|-----------|------------|------------------|-------------|-------------|--------------------|-------------|----------------|-----------|
| 03-02-18 | 12:34:40 | 17,381285 | -63,331506 | Hopper Camera    | Begin       | BEGIN       | NICO_Leg 6HOPCAM14 |             | 214            | 21,73     |
| 03-02-18 | 12:35:11 | 17,381267 | -63,331479 | Hopper Camera    | Start track | START       | NICO_Leg 6HOPCAM14 |             | 214            | 21,55     |
| 03-02-18 | 13:59:37 | 17,369148 | -63,324825 | Hopper Camera    | End track   | END TRACK   | NICO_Leg 6HOPCAM14 |             | 214            | 21,32     |
| 03-02-18 | 14:05:58 | 17,368759 | -63,324076 | Hopper Camera    | End         | END         | NICO_Leg 6HOPCAM14 |             | 214            | 23,72     |
| 03-02-18 | 14:27:08 | 17,381864 | -63,340018 | Hopper Camera    | Begin       | BEGIN       | NICO_Leg 6HOPCAM15 |             | 215            | 23,72     |
| 03-02-18 | 14:29:59 | 17,381933 | -63,340013 | Hopper Camera    | Start track | START       | NICO_Leg 6HOPCAM15 |             | 215            | 20,5      |
| 03-02-18 | 15:05:21 | 17,387343 | -63,339475 | Hopper Camera    | End track   | END TRACK   | NICO_Leg 6HOPCAM15 |             | 215            | 22,14     |
| 03-02-18 | 15:06:11 | 17,387482 | -63,339479 | Hopper Camera    | End         | END         | NICO_Leg 6HOPCAM15 |             | 215            | 22,12     |
| 03-02-18 | 15:51:23 | 17,38388  | -63,29046  | Mooring          | Deployment  | DEP         | NICO_Leg 6MOOR9    | Pumpy       | 5_10           | 15,58     |
| 03-02-18 | 17:15:26 | 17,383711 | -63,289799 | CTD with samples | Begin       | BEGIN       | NICO_Leg 6CTDBOT9  |             | 5_11           | 16,27     |
| 03-02-18 | 17:19:10 | 17,38378  | -63,289864 | CTD with samples | Bottom      | BOT         | NICO_Leg 6CTDBOT9  |             | 5_11           | 14,99     |
| 03-02-18 | 17:24:24 | 17,383655 | -63,289956 | CTD with samples | End         | END         | NICO_Leg 6CTDBOT9  |             | 5_11           | 15,57     |
| 03-02-18 | 17:52:25 | 17,384014 | -63,290536 | Mooring          | Recovery    | REC         | NICO_Leg 6MOOR9    | Pumpy       | 5_10           | 15,49     |
| 03-02-18 | 18:06:14 | 17,384895 | -63,290409 | CTD              | Begin       | BEGIN       | NICO_Leg 6CTD11    |             | 5_12           | 21,81     |
| 03-02-18 | 18:09:23 | 17,384861 | -63,290445 | CTD              | Bottom      | BOT         | NICO_Leg 6CTD11    |             | 5_12           | 21,23     |
| 03-02-18 | 18:11:39 | 17,384809 | -63,29045  | CTD              | End         | END         | NICO_Leg 6CTD11    |             | 5_12           | 21,33     |
| 03-02-18 | 18:23:54 | 17,383171 | -63,288871 | CTD              | Begin       | BEGIN       | NICO_Leg 6CTD12    |             | 5_13           | 20,46     |
| 03-02-18 | 18:27:07 | 17,383033 | -63,288881 | CTD              | Bottom      | BOT         | NICO_Leg 6CTD12    |             | 5_13           | 20,45     |
| 03-02-18 | 18:31:43 | 17,382714 | -63,289164 | CTD              | End         | END         | NICO_Leg 6CTD12    |             | 5_13           | 17,84     |
| 03-02-18 | 18:44:32 | 17,381462 | -63,290298 | CTD              | Begin       | BEGIN       | NICO_Leg 6CTD13    |             | 5_14           | 15,73     |
| 03-02-18 | 18:47:35 | 17,381428 | -63,290254 | CTD              | Bottom      | BOT         | NICO_Leg 6CTD13    |             | 5_14           | 16,28     |
| 03-02-18 | 18:50:25 | 17,381273 | -63,290187 | CTD              | End         | END         | NICO_Leg 6CTD13    |             | 5_14           | 16,55     |
| 03-02-18 | 19:05:50 | 17,382952 | -63,292514 | CTD              | Begin       | BEGIN       | NICO_Leg 6CTD14    |             | 5_15           | 16,49     |
| 03-02-18 | 19:08:38 | 17,382965 | -63,29248  | CTD              | Bottom      | BOT         | NICO_Leg 6CTD14    |             | 5_15           | 16,57     |
| 03-02-18 | 19:10:55 | 17,382936 | -63,292424 | CTD              | End         | END         | NICO_Leg 6CTD14    |             | 5_15           | 16,57     |
| 03-02-18 | 20:09:31 | 17,380087 | -63,292731 | Boxcore          | Bottom      | BOT         | NICO_Leg 6BOX1253  |             | 5_16           | 22,01     |
| 03-02-18 | 20:53:42 | 17,383831 | -63,290468 | Mooring          | Deployment  | DEP         | NICO_Leg 6MOOR10   | Pumpy       | 5_17           | 15,61     |
| 03-02-18 | 21:12:34 | 17,384215 | -63,290746 | CTD with samples | Begin       | BEGIN       | NICO_Leg 6CTDBOT10 |             | 5_18           | 16,23     |
| 03-02-18 | 21:17:50 | 17,384161 | -63,290723 | CTD with samples | Bottom      | BOT         | NICO_Leg 6CTDBOT10 |             | 5_18           | 15,33     |
| 03-02-18 | 21:25:39 | 17,384171 | -63,290845 | CTD with samples | End         | END         | NICO_Leg 6CTDBOT10 |             | 5_18           | 16,56     |
| 03-02-18 | 22:35:17 | 17,383914 | -63,290424 | Mooring          | Recovery    | REC         | NICO_Leg 6MOOR10   | Pumpy       | 5_17           | 16,48     |
| 03-02-18 | 22:44:53 | 17,383133 | -63,29034  | Mooring          | Recovery    | REC         | NICO_Leg 6MOOR10   | EDCO        | 5_1            | 15,56     |
| 03-02-18 | 23:57:38 | 17,472031 | -63,382584 | Hopper Camera    | Begin       | BEGIN       | NICO_Leg 6HOPCAM16 |             | 216            | 22,08     |
| 03-02-18 | 23:58:57 | 17,471994 | -63,382514 | Hopper Camera    | Start track | START       | NICO_Leg 6HOPCAM16 |             | 216            | 22,06     |
| 03-03-18 | 0:43:59  | 17,482659 | -63,388256 | Hopper Camera    | End track   | END TRACK   | NICO_Leg 6HOPCAM16 |             | 216            | 24,3      |
| 03-03-18 | 0:45:58  | 17,483084 | -63,388562 | Hopper Camera    | End         | END         | NICO_Leg 6HOPCAM16 |             | 216            | 24,47     |
| 03-03-18 | 10:09:49 | 17,48347  | -63,388133 | Mooring          | Deployment  | DEP         | NICO_Leg 6MOOR11   | Pumpy       | 6_1            | 23,85     |
| 03-03-18 | 10:38:47 | 17,48246  | -63,388142 | Mooring          | Deployment  | DEP         | NICO_Leg 6MOOR12   | EDCO        | 6_2            | 25,1      |
| 03-03-18 | 10:49:33 | 17,483318 | -63,388548 | CTD with samples | Begin       | BEGIN       | NICO_Leg 6CTDBOT11 |             | 6_3            | 24,2      |
| 03-03-18 | 10:55:15 | 17,483415 | -63,38857  | CTD with samples | Bottom      | BOT         | NICO_Leg 6CTDBOT11 |             | 6_3            | 23,94     |
| 03-03-18 | 11:04:24 | 17,483392 | -63,388509 | CTD with samples | End         | END         | NICO_Leg 6CTDBOT11 |             | 6_3            | 24,64     |
| 03-03-18 | 12:03:13 | 17,483573 | -63,388088 | Mooring          | Recovery    | REC         | NICO_Leg 6MOOR12   | Pumpy       | 6_1            | 23,7      |
| 03-03-18 | 12:03:16 | 17,483569 | -63,38809  | Mooring          | Recovery    | REC         | NICO_Leg 6MOOR12   | Pumpy       | 6_1            | 24,27     |
| 03-03-18 | 12:33:29 | 17,513495 | -63,363174 | Hopper Camera    | Begin       | BEGIN       | NICO_Leg 6HOPCAM17 |             | 217            | 25,49     |
| 03-03-18 | 12:34:33 | 17,513591 | -63,363195 | Hopper Camera    | Start track | START       | NICO_Leg 6HOPCAM17 |             | 217            | 25        |
| 03-03-18 | 13:16:20 | 17,522315 | -63,371306 | Hopper Camera    | End track   | END TRACK   | NICO_Leg 6HOPCAM17 |             | 217            | 24,29     |
| 03-03-18 | 13:21:15 | 17,523371 | -63,372244 | Hopper Camera    | End         | END         | NICO_Leg 6HOPCAM17 |             | 217            | 24,4      |
| 03-03-18 | 13:35:07 | 17,535129 | -63,378001 | Hopper Camera    | Begin       | BEGIN       | NICO_Leg 6HOPCAM18 |             | 218            | 24,88     |
| 03-03-18 | 13:36:07 | 17,534925 | -63,377845 | Hopper Camera    | Start track | START       | NICO_Leg 6HOPCAM18 |             | 218            | 24,38     |
| 03-03-18 | 13:57:33 | 17,537798 | -63,383225 | Hopper Camera    | End track   | END TRACK   | NICO_Leg 6HOPCAM18 |             | 218            | 26,03     |
| 03-03-18 | 13:59:45 | 17,538061 | -63,38379  | Hopper Camera    | End         | END         | NICO_Leg 6HOPCAM18 |             | 218            | 25,81     |
| 03-03-18 | 14:28:43 | 17,521235 | -63,423099 | Hopper Camera    | Begin       | BEGIN       | NICO_Leg 6HOPCAM19 |             | 219            | 25,43     |
| 03-03-18 | 14:30:02 | 17,521218 | -63,423059 | Hopper Camera    | Start track | START       | NICO_Leg 6HOPCAM19 |             | 219            | 24,59     |
| 03-03-18 | 14:44:21 | 17,518035 | -63,42655  | Hopper Camera    | End track   | END TRACK   | NICO_Leg 6HOPCAM19 |             | 219            | 25,68     |
| 03-03-18 | 14:46:33 | 17,517571 | -63,42697  | Hopper Camera    | End         | END         | NICO_Leg 6HOPCAM19 |             | 219            | 25,48     |
| 03-03-18 | 14:59:04 | 17,513124 | -63,417528 | Hopper Camera    | Begin       | BEGIN       | NICO_Leg 6HOPCAM20 |             | 220            | 26        |
| 03-03-18 | 14:59:10 | 17,513113 | -63,417515 | Hopper Camera    | Start track | START       | NICO_Leg 6HOPCAM20 |             | 220            | 25,89     |
| 03-03-18 | 15:31:16 | 17,510432 | -63,40928  | Hopper Camera    | End track   | END TRACK   | NICO_Leg 6HOPCAM20 |             | 220            | 27,22     |
| 03-03-18 | 15:32:53 | 17,510276 | -63,408898 | Hopper Camera    | End         | END         | NICO_Leg 6HOPCAM20 |             | 220            | 27,07     |
| 03-03-18 | 16:02:10 | 17,483417 | -63,388148 | Mooring          | Deployment  | DEP         | NICO_Leg 6MOOR13   | Pumpy       | 6_4            | 23,88     |
| 03-03-18 | 17:07:17 | 17,483684 | -63,387911 | CTD with samples | Begin       | BEGIN       | NICO_Leg 6CTDBOT12 |             | 6_5            | 24,17     |
| 03-03-18 | 17:13:20 | 17,483699 | -63,387934 | CTD with samples | Bottom      | BOT         | NICO_Leg 6CTDBOT12 |             | 6_5            | 23,4      |
| 03-03-18 | 17:21:56 | 17,4837   | -63,387856 | CTD with samples | End         | END         | NICO_Leg 6CTDBOT12 |             | 6_5            | 24,51     |
| 03-03-18 | 17:49:01 | 17,483291 | -63,388375 | Mooring          | Recovery    | REC         | NICO_Leg 6MOOR13   | Pumpy       | 6_4            | 23,65     |
| 03-03-18 | 18:03:51 | 17,482403 | -63,389862 | CTD              | Begin       | BEGIN       | NICO_Leg 6CTD15    |             | 6_6            | 24,31     |
| 03-03-18 | 18:05:29 | 17,482401 | -63,389879 | CTD              | Bottom      | BOT         | NICO_Leg 6CTD15    |             | 6_6            | 23,86     |
| 03-03-18 | 18:07:38 | 17,4824   | -63,38988  | CTD              | End         | END         | NICO_Leg 6CTD15    |             | 6_6            | 23,73     |
| 03-03-18 | 18:21:58 | 17,480631 | -63,388206 | CTD              | Begin       | BEGIN       | NICO_Leg 6CTD16    |             | 6_7            | 25,15     |
| 03-03-18 | 18:24:25 | 17,480635 | -63,388134 | CTD              | Bottom      | BOT         | NICO_Leg 6CTD16    |             | 6_7            | 25,47     |
| 03-03-18 | 18:27:15 | 17,480646 | -63,388077 | CTD              | End         | END         | NICO_Leg 6CTD16    |             | 6_7            | 25,35     |
| 03-03-18 | 18:37:58 | 17,482315 | -63,386113 | CTD              | Begin       | BEGIN       | NICO_Leg 6CTD17    |             | 6_8            | 24,83     |

| Date     | Heure    | Latitude  | Longitude  | Device name      | Action name | Action code | Operation Id       | Observation | Station number | Depth (m) |
|----------|----------|-----------|------------|------------------|-------------|-------------|--------------------|-------------|----------------|-----------|
| 03-03-18 | 18:40:22 | 17,482452 | -63,386095 | CTD              | Bottom      | BOT         | NICO_Leg 6CTD17    |             | 6_8            | 24,7      |
| 03-03-18 | 18:42:43 | 17,482481 | -63,386    | CTD              | End         | END         | NICO_Leg 6CTD17    |             | 6_8            | 25,01     |
| 03-03-18 | 18:56:00 | 17,484268 | -63,387909 | CTD              | Begin       | BEGIN       | NICO_Leg 6CTD18    |             | 6_9            | 23,99     |
| 03-03-18 | 18:58:20 | 17,484363 | -63,387959 | CTD              | Bottom      | BOT         | NICO_Leg 6CTD18    |             | 6_9            | 24,19     |
| 03-03-18 | 19:01:10 | 17,484413 | -63,387877 | CTD              | End         | END         | NICO_Leg 6CTD18    |             | 6_9            | 23,7      |
| 03-03-18 | 20:51:57 | 17,482396 | -63,387052 | Mooring          | Deployment  | DEP         | NICO_Leg 6MOOR14   | Pumpy       | 6_10           | 24,91     |
| 03-03-18 | 21:13:55 | 17,482919 | -63,387148 | CTD with samples | Begin       | BEGIN       | NICO_Leg 6CTDBOT13 |             | 6_11           | 24,83     |
| 03-03-18 | 21:15:18 | 17,482923 | -63,387177 | CTD with samples | Bottom      | BOT         | NICO_Leg 6CTDBOT13 |             | 6_11           | 24,9      |
| 03-03-18 | 21:24:05 | 17,482963 | -63,387133 | CTD with samples | End         | END         | NICO_Leg 6CTDBOT13 |             | 6_11           | 24,76     |
| 03-03-18 | 22:34:58 | 17,482455 | -63,387121 | Mooring          | Recovery    | REC         | NICO_Leg 6MOOR14   | Pumpy       | 6_10           | 25,1      |
| 03-04-18 | 10:09:02 | 17,482455 | -63,387079 | Mooring          | Deployment  | DEP         | NICO_Leg 6MOOR15   | Pumpy       | 6_12           | 24,87     |
| 03-04-18 | 10:27:58 | 17,483076 | -63,387106 | CTD with samples | Begin       | BEGIN       | NICO_Leg 6CTDBOT14 |             | 6_13           | 25,47     |
| 03-04-18 | 10:30:00 | 17,483098 | -63,387132 | CTD with samples | Bottom      | BOT         | NICO_Leg 6CTDBOT14 |             | 6_13           | 24,88     |
| 03-04-18 | 10:38:23 | 17,482961 | -63,387141 | CTD with samples | End         | END         | NICO_Leg 6CTDBOT14 |             | 6_13           | 24,93     |
| 03-04-18 | 11:51:02 | 17,482466 | -63,387076 | Mooring          | Recovery    | REC         | NICO_Leg 6MOOR15   | Pumpy       | 6_12           | 25,83     |
| 03-04-18 | 12:01:09 | 17,482302 | -63,388296 | Mooring          | Recovery    | REC         | NICO_Leg 6MOOR15   | EDCO        | 6_2            | 24,93     |
| 03-04-18 | 13:31:31 | 17,424205 | -63,529834 | Hopper Camera    | Begin       | BEGIN       | NICO_Leg 6HOPCAM21 |             | 221            | 30,82     |
| 03-04-18 | 13:32:01 | 17,424166 | -63,529855 | Hopper Camera    | Start track | START       | NICO_Leg 6HOPCAM21 |             | 221            | 30,82     |
| 03-04-18 | 13:47:22 | 17,422218 | -63,532911 | Hopper Camera    | End track   | END TRACK   | NICO_Leg 6HOPCAM21 |             | 221            | 31,35     |
| 03-04-18 | 13:52:08 | 17,421425 | -63,534314 | Hopper Camera    | End         | END         | NICO_Leg 6HOPCAM21 |             | 221            | 31,31     |
| 03-04-18 | 14:20:10 | 17,42069  | -63,562609 | Hopper Camera    | Begin       | BEGIN       | NICO_Leg 6HOPCAM22 |             | 222            | 33,58     |
| 03-04-18 | 14:21:37 | 17,420745 | -63,562711 | Hopper Camera    | Start track | START       | NICO_Leg 6HOPCAM22 |             | 222            | 33,79     |
| 03-04-18 | 14:33:29 | 17,420871 | -63,565658 | Hopper Camera    | End track   | END TRACK   | NICO_Leg 6HOPCAM22 |             | 222            | 34,91     |
| 03-04-18 | 14:34:58 | 17,420946 | -63,566032 | Hopper Camera    | End         | END         | NICO_Leg 6HOPCAM22 |             | 222            | 34,76     |
| 03-04-18 | 15:39:25 | 17,420677 | -63,562642 | Mooring          | Deployment  | DEP         | NICO_Leg 6MOOR16   | Pumpy       | 7_1            | 33,38     |
| 03-04-18 | 16:01:34 | 17,421611 | -63,562647 | Mooring          | Deployment  | DEP         | NICO_Leg 6MOOR17   | EDCO        | 7_2            | 33,29     |
| 03-04-18 | 17:25:04 | 17,420769 | -63,562403 | CTD with samples | Begin       | BEGIN       | NICO_Leg 6CTDBOT15 |             | 7_3            | 33,75     |
| 03-04-18 | 17:29:42 | 17,420801 | -63,5624   | CTD with samples | Bottom      | BOT         | NICO_Leg 6CTDBOT15 |             | 7_3            | 33,8      |
| 03-04-18 | 17:44:44 | 17,420908 | -63,562442 | CTD with samples | End         | END         | NICO_Leg 6CTDBOT15 |             | 7_3            | 34,12     |
| 03-04-18 | 17:45:05 | 17,420902 | -63,562414 | CTD with samples | Begin       | BEGIN       | NICO_Leg 6CTDBOT17 |             | 7_4            | 33,97     |
| 03-04-18 | 17:49:48 | 17,420968 | -63,562465 | CTD with samples | End         | END         | NICO_Leg 6CTDBOT16 |             | 7_4            | 33,58     |
| 03-04-18 | 18:19:12 | 17,420637 | -63,562531 | Mooring          | Recovery    | REC         | NICO_Leg 6MOOR17   | Pumpy       | 7_1            | 32,76     |
| 03-04-18 | 18:29:36 | 17,419689 | -63,562473 | CTD              | Begin       | BEGIN       | NICO_Leg 6CTD19    |             | 7_5            | 33,37     |
| 03-04-18 | 18:32:29 | 17,419784 | -63,56242  | CTD              | Bottom      | BOT         | NICO_Leg 6CTD19    |             | 7_5            | 33,56     |
| 03-04-18 | 18:34:16 | 17,419748 | -63,562375 | CTD              | End         | END         | NICO_Leg 6CTD19    |             | 7_5            | 33,67     |
| 03-04-18 | 18:50:15 | 17,421356 | -63,564494 | CTD              | Begin       | BEGIN       | NICO_Leg 6CTD20    |             | 7_6            | 33,73     |
| 03-04-18 | 18:52:56 | 17,421545 | -63,564409 | CTD              | Bottom      | BOT         | NICO_Leg 6CTD20    |             | 7_6            | 33,52     |
| 03-04-18 | 18:54:51 | 17,421548 | -63,564349 | CTD              | End         | END         | NICO_Leg 6CTD20    |             | 7_6            | 34,03     |
| 03-04-18 | 19:05:11 | 17,423423 | -63,562617 | CTD              | Begin       | BEGIN       | NICO_Leg 6CTD21    |             | 7_7            | 33,94     |
| 03-04-18 | 19:08:00 | 17,423445 | -63,562608 | CTD              | Bottom      | BOT         | NICO_Leg 6CTD21    |             | 7_7            | 33,21     |
| 03-04-18 | 19:09:37 | 17,423389 | -63,562619 | CTD              | End         | END         | NICO_Leg 6CTD21    |             | 7_7            | 34,76     |
| 03-04-18 | 19:26:02 | 17,421529 | -63,560661 | CTD              | Begin       | BEGIN       | NICO_Leg 6CTD22    |             | 7_8            | 34,05     |
| 03-04-18 | 19:28:58 | 17,421489 | -63,560759 | CTD              | Bottom      | BOT         | NICO_Leg 6CTD22    |             | 7_8            | 31,75     |
| 03-04-18 | 19:30:59 | 17,421502 | -63,560719 | CTD              | End         | END         | NICO_Leg 6CTD22    |             | 7_8            | 33,38     |
| 03-04-18 | 19:57:28 | 17,422264 | -63,561639 | Boxcore          | Bottom      | BOT         | NICO_Leg 6BOX1254  |             | 7_9            | 34,73     |
| 03-04-18 | 20:31:24 | 17,422319 | -63,561784 | Boxcore          | Bottom      | BOT         | NICO_Leg 6BOX1255  |             | 7_10           | 32,89     |
| 03-04-18 | 21:26:05 | 17,420605 | -63,562624 | Mooring          | Deployment  | DEP         | NICO_Leg 6MOOR18   | Pumpy       | 7_11           | 32,56     |
| 03-04-18 | 22:34:41 | 17,420604 | -63,561976 | CTD with samples | Begin       | BEGIN       | NICO_Leg 6CTDBOT18 |             | 7_12           | 33,47     |
| 03-04-18 | 22:36:20 | 17,420592 | -63,562016 | CTD with samples | Bottom      | BOT         | NICO_Leg 6CTDBOT18 |             | 7_12           | 34,35     |
| 03-04-18 | 22:46:29 | 17,420526 | -63,562051 | CTD with samples | End         | END         | NICO_Leg 6CTDBOT18 |             | 7_12           | 33,81     |
| 03-04-18 | 23:08:21 | 17,420663 | -63,562672 | Mooring          | Recovery    | REC         | NICO_Leg 6MOOR18   | Pumpy       | 7_11           | 33,74     |
| 03-05-18 | 10:05:11 | 17,420645 | -63,562662 | Mooring          | Deployment  | DEP         | NICO_Leg 6MOOR19   | Pumpy       | 7_13           | 33,58     |
| 03-05-18 | 10:26:26 | 17,420642 | -63,562147 | CTD with samples | Begin       | BEGIN       | NICO_Leg 6CTDBOT19 |             | 7_14           | 32,57     |
| 03-05-18 | 10:28:29 | 17,420611 | -63,562052 | CTD with samples | Bottom      | BOT         | NICO_Leg 6CTDBOT19 |             | 7_14           | 33,44     |
| 03-05-18 | 10:37:34 | 17,420612 | -63,562266 | CTD with samples | End         | END         | NICO_Leg 6CTDBOT19 |             | 7_14           | 34,2      |
| 03-05-18 | 11:38:55 | 17,420586 | -63,562671 | Mooring          | Recovery    | REC         | NICO_Leg 6MOOR19   | Pumpy       | 7_13           | 32,82     |
| 03-05-18 | 12:53:34 | 17,501854 | -63,642946 | CTD with samples | Begin       | BEGIN       | NICO_Leg 6CTDBOT20 |             | 8_1            | 230,53    |
| 03-05-18 | 12:58:28 | 17,502261 | -63,642958 | CTD with samples | Bottom      | BOT         | NICO_Leg 6CTDBOT20 |             | 8_1            | 227,17    |
| 03-05-18 | 13:20:49 | 17,502635 | -63,642678 | CTD with samples | End         | END         | NICO_Leg 6CTDBOT20 |             | 8_1            | 228,01    |
| 03-05-18 | 14:27:53 | 17,422947 | -63,562321 | Boxcore          | Bottom      | BOT         | NICO_Leg 6BOX1256  |             | 7_15           | 33,38     |
| 03-05-18 | 15:26:52 | 17,420465 | -63,562656 | Mooring          | Deployment  | DEP         | NICO_Leg 6MOOR20   | PUMPY       | 7_16           | 34,45     |
| 03-05-18 | 15:53:52 | 17,418886 | -63,562556 | CTD              | Begin       | BEGIN       | NICO_Leg 6CTD23    |             | 7_17           | 33,51     |
| 03-05-18 | 15:55:19 | 17,418947 | -63,562593 | CTD              | Bottom      | BOT         | NICO_Leg 6CTD23    |             | 7_17           | 35,02     |
| 03-05-18 | 16:04:55 | 17,419022 | -63,562607 | CTD              | End         | END         | NICO_Leg 6CTD23    |             | 7_17           | 33,83     |
| 03-05-18 | 16:22:35 | 17,421499 | -63,562699 | Mooring          | Recovery    | REC         | NICO_Leg 6MOOR21   | EDCO        | 7_2            | 31,77     |
| 03-05-18 | 17:17:12 | 17,42047  | -63,56279  | Mooring          | Recovery    | REC         | NICO_Leg 6MOOR21   | Pumpy       | 7_16           | 34,86     |
| 03-05-18 | 18:37:34 | 17,261458 | -63,539017 | Hopper Camera    | Begin       | BEGIN       | NICO_Leg 6HOPCAM23 |             | 223            | 63,36     |
| 03-05-18 | 18:42:18 | 17,261742 | -63,538869 | Hopper Camera    | Start track | START       | NICO_Leg 6HOPCAM23 |             | 223            | 47,78     |
| 03-05-18 | 20:00:27 | 17,265266 | -63,543862 | Hopper Camera    | End track   | END TRACK   | NICO_Leg 6HOPCAM23 |             | 223            | 19,93     |
| 03-05-18 | 20:07:42 | 17,265217 | -63,543962 | Hopper Camera    | End         | END         | NICO_Leg 6HOPCAM23 |             | 223            | 21,51     |
| 03-05-18 | 20:48:48 | 17,264241 | -63,540409 | Mooring          | Deployment  | DEP         | NICO_Leg 6MOOR22   | Pumpy       | 9_1            | 26,87     |

| Date       | Heure    | Latitude  | Longitude  | Device name      | Action name | Action code | Operation Id       | Observation | Station number | Depth (m) |
|------------|----------|-----------|------------|------------------|-------------|-------------|--------------------|-------------|----------------|-----------|
| 03-05-18   | 21:10:03 | 17,264255 | -63,539889 | CTD with samples | Begin       | BEGIN       | NICO_Leg 6CTDBOT21 |             | 9_2            | 27,07     |
| 03-05-18   | 21:14:34 | 17,264278 | -63,53989  | CTD with samples | Bottom      | BOT         | NICO_Leg 6CTDBOT21 |             | 9_2            | 28,04     |
| 03-05-18   | 21:22:39 | 17,264212 | -63,539838 | CTD with samples | End         | END         | NICO_Leg 6CTDBOT21 |             | 9_2            | 27,01     |
| 03-05-18   | 22:43:30 | 17,264223 | -63,540368 | Mooring          | Recovery    | REC         | NICO_Leg 6MOOR22   | Pumpy       | 9_1            | 25,89     |
| 03-05-18   | 23:17:22 | 17,261702 | -63,560459 | Hopper Camera    | Begin       | BEGIN       | NICO_Leg 6HOPCAM24 |             | 224            | 24,91     |
| 03-05-18   | 23:18:00 | 17,261757 | -63,560442 | Hopper Camera    | Start track | START       | NICO_Leg 6HOPCAM24 |             | 224            | 23,83     |
| 03-05-18   | 23:41:15 | 17,264703 | -63,560348 | Hopper Camera    | End track   | END TRACK   | NICO_Leg 6HOPCAM24 |             | 224            | 19,17     |
| 03-05-18   | 23:44:32 | 17,264797 | -63,560495 | Hopper Camera    | End         | END         | NICO_Leg 6HOPCAM24 |             | 224            | 18,52     |
| 03-06-18   | 0:00:44  | 17,273249 | -63,555815 | Hopper Camera    | Begin       | BEGIN       | NICO_Leg 6HOPCAM25 |             | 225            | 27,6      |
| 03-06-18   | 0:01:20  | 17,273283 | -63,555847 | Hopper Camera    | Start track | START       | NICO_Leg 6HOPCAM25 |             | 225            | 27,83     |
| 03-06-18   | 0:18:37  | 17,273213 | -63,552948 | Hopper Camera    | End track   | END TRACK   | NICO_Leg 6HOPCAM25 |             | 225            | 27,07     |
| 03-06-18   | 0:20:45  | 17,273302 | -63,552671 | Hopper Camera    | End         | END         | NICO_Leg 6HOPCAM25 |             | 225            | 25,48     |
| 03-06-18   | 10:10:48 | 17,264193 | -63,540343 | Mooring          | Deployment  | DEP         | NICO_Leg 6MOOR23   | Pumpy       | 9_3            | 25,46     |
| 03-06-18   | 10:27:10 | 17,264029 | -63,539783 | CTD with samples | Begin       | BEGIN       | NICO_Leg 6CTDBOT22 |             | 9_4            | 26,68     |
| 03-06-18   | 10:30:22 | 17,264059 | -63,53997  | CTD with samples | Bottom      | BOT         | NICO_Leg 6CTDBOT22 |             | 9_4            | 25,69     |
| 03-06-18   | 10:38:16 | 17,264013 | -63,539887 | CTD with samples | End         | END         | NICO_Leg 6CTDBOT22 |             | 9_4            | 26,01     |
| not logged |          |           |            |                  |             | REC         |                    | Pumpy       | 9_3            |           |
| 03-06-18   | 13:28:58 | 17,260789 | -63,573626 | Hopper Camera    | Begin       | BEGIN       | NICO_Leg 6HOPCAM26 |             | 226            | 34,4      |
| 03-06-18   | 13:29:50 | 17,260757 | -63,573654 | Hopper Camera    | Start track | START       | NICO_Leg 6HOPCAM26 |             | 226            | 35,36     |
| 03-06-18   | 13:47:14 | 17,262891 | -63,574801 | Hopper Camera    | End track   | END TRACK   | NICO_Leg 6HOPCAM26 |             | 226            | 26,68     |
| 03-06-18   | 13:50:23 | 17,263026 | -63,574946 | Hopper Camera    | End         | END         | NICO_Leg 6HOPCAM26 |             | 226            | 27,27     |
| 03-06-18   | 13:58:50 | 17,267795 | -63,575146 | Hopper Camera    | Begin       | BEGIN       | NICO_Leg 6HOPCAM27 |             | 227            | 26,62     |
| 03-06-18   | 13:58:55 | 17,267803 | -63,575158 | Hopper Camera    | Start track | START       | NICO_Leg 6HOPCAM27 |             | 227            | 25,25     |
| 03-06-18   | 14:31:32 | 17,267088 | -63,578877 | Hopper Camera    | End track   | END TRACK   | NICO_Leg 6HOPCAM27 |             | 227            | 25,32     |
| 03-06-18   | 14:32:38 | 17,267054 | -63,578838 | Hopper Camera    | End         | END         | NICO_Leg 6HOPCAM27 |             | 227            | 25,3      |
| 03-06-18   | 14:48:34 | 17,256752 | -63,579483 | Hopper Camera    | Begin       | BEGIN       | NICO_Leg 6HOPCAM28 |             | 228            | 31,21     |
| 03-06-18   | 14:48:38 | 17,256749 | -63,579493 | Hopper Camera    | Start track | START       | NICO_Leg 6HOPCAM28 |             | 228            | 31,36     |
| 03-06-18   | 15:11:08 | 17,259672 | -63,581883 | Hopper Camera    | End track   | END TRACK   | NICO_Leg 6HOPCAM28 |             | 228            | 23,82     |
| 03-06-18   | 15:13:22 | 17,259679 | -63,582109 | Hopper Camera    | End         | END         | NICO_Leg 6HOPCAM28 |             | 228            | 20,67     |
| 03-06-18   | 15:47:17 | 17,264275 | -63,540445 | Mooring          | Deployment  | DEP         | NICO_Leg 6MOOR24   | Pumpy       | 9_9            | 27        |
| 03-06-18   | 16:08:43 | 17,265712 | -63,540643 | CTD with samples | Begin       | BEGIN       | NICO_Leg 6CTDBOT23 |             | 9_10           | 18,79     |
| 03-06-18   | 16:12:40 | 17,265725 | -63,54062  | CTD with samples | Bottom      | BOT         | NICO_Leg 6CTDBOT23 |             | 9_10           | 17,96     |
| 03-06-18   | 16:17:37 | 17,265844 | -63,540926 | CTD with samples | End         | END         | NICO_Leg 6CTDBOT23 |             | 9_10           | 18,35     |
| 03-06-18   | 17:10:07 | 17,264193 | -63,539797 | CTD with samples | Begin       | BEGIN       | NICO_Leg 6CTDBOT24 |             | 9_11           | 25,57     |
| 03-06-18   | 17:15:04 | 17,264159 | -63,539841 | CTD with samples | Bottom      | BOT         | NICO_Leg 6CTDBOT24 |             | 9_11           | 25,89     |
| 03-06-18   | 17:19:02 | 17,264117 | -63,539857 | CTD with samples | End         | END         | NICO_Leg 6CTDBOT24 |             | 9_11           | 26,28     |
| 03-06-18   | 17:43:46 | 17,26432  | -63,540391 | Mooring          | Recovery    | REC         | NICO_Leg 6MOOR24   | Pumpy       | 9_9            | 24,89     |
| 03-06-18   | 18:15:38 | 17,270487 | -63,552479 | Hopper Camera    | Begin       | BEGIN       | NICO_Leg 6HOPCAM29 |             | 229            | 24,51     |
| 03-06-18   | 18:16:53 | 17,270615 | -63,552481 | Hopper Camera    | Start track | START       | NICO_Leg 6HOPCAM29 |             | 229            | 24,71     |
| 03-06-18   | 18:54:20 | 17,27333  | -63,555597 | Hopper Camera    | End track   | END TRACK   | NICO_Leg 6HOPCAM29 |             | 229            | 26,28     |
| 03-06-18   | 18:57:52 | 17,27332  | -63,556065 | Hopper Camera    | End         | END         | NICO_Leg 6HOPCAM29 |             | 229            | 27,81     |
| 03-06-18   | 19:08:08 | 17,276702 | -63,55718  | Hopper Camera    | Begin       | BEGIN       | NICO_Leg 6HOPCAM30 |             | 230            | 31,64     |
| 03-06-18   | 19:10:24 | 17,276702 | -63,557372 | Hopper Camera    | Start track | START       | NICO_Leg 6HOPCAM30 |             | 230            | 29,83     |
| 03-06-18   | 19:24:27 | 17,276522 | -63,559232 | Hopper Camera    | End track   | END TRACK   | NICO_Leg 6HOPCAM30 |             | 230            | 26,63     |
| 03-06-18   | 19:32:20 | 17,276667 | -63,561088 | Hopper Camera    | End         | END         | NICO_Leg 6HOPCAM30 |             | 230            | 31,01     |
| 03-06-18   | 19:50:08 | 17,269606 | -63,569351 | Hopper Camera    | Begin       | BEGIN       | NICO_Leg 6HOPCAM31 |             | 231            | 34,76     |
| 03-06-18   | 19:51:38 | 17,26976  | -63,569332 | Hopper Camera    | Start track | START       | NICO_Leg 6HOPCAM31 |             | 231            | 33,19     |
| 03-06-18   | 20:07:38 | 17,269284 | -63,571506 | Hopper Camera    | End track   | END TRACK   | NICO_Leg 6HOPCAM31 |             | 231            | 26,87     |
| 03-06-18   | 20:09:01 | 17,269218 | -63,571613 | Hopper Camera    | End         | END         | NICO_Leg 6HOPCAM31 |             | 231            | 26,34     |
| 03-06-18   | 20:33:59 | 17,261829 | -63,574074 | Mooring          | Deployment  | DEP         | NICO_Leg 6MOOR25   | EDCO        | 10_1           | 36,14     |
| 03-06-18   | 20:49:49 | 17,261461 | -63,573932 | Mooring          | Deployment  | DEP         | NICO_Leg 6MOOR26   | Pumpy       | 10_2           | 28,65     |
| 03-06-18   | 21:09:32 | 17,261431 | -63,573469 | CTD with samples | Begin       | BEGIN       | NICO_Leg 6CTDBOT25 |             | 10_3           | 28,73     |
| 03-06-18   | 21:12:37 | 17,26143  | -63,573444 | CTD with samples | Bottom      | BOT         | NICO_Leg 6CTDBOT25 |             | 10_3           | 29,37     |
| 03-06-18   | 21:20:43 | 17,261418 | -63,573482 | CTD with samples | End         | END         | NICO_Leg 6CTDBOT25 |             | 10_3           | 29,04     |
| 03-06-18   | 22:37:15 | 17,261479 | -63,573937 | Mooring          | Recovery    | REC         | NICO_Leg 6MOOR26   | Pumpy       | 10_2           | 29,04     |
| 03-06-18   | 23:32:35 | 17,226449 | -63,593966 | Hopper Camera    | Begin       | BEGIN       | NICO_Leg 6HOPCAM32 |             | 232            | 24,78     |
| 03-06-18   | 23:33:38 | 17,226458 | -63,593922 | Hopper Camera    | Start track | START       | NICO_Leg 6HOPCAM32 |             | 232            | 23,97     |
| 03-07-18   | 0:35:22  | 17,237244 | -63,606435 | Hopper Camera    | End track   | END TRACK   | NICO_Leg 6HOPCAM32 |             | 232            | 23,42     |
| 03-07-18   | 0:36:49  | 17,237488 | -63,606813 | Hopper Camera    | End         | END         | NICO_Leg 6HOPCAM32 |             | 232            | 23,69     |
| 03-07-18   | 10:12:22 | 17,261357 | -63,574037 | Mooring          | Deployment  | DEP         | NICO_Leg 6MOOR27   | Pumpy       | 10_4           | 28,33     |
| 03-07-18   | 10:33:47 | 17,260931 | -63,573937 | CTD with samples | Begin       | BEGIN       | NICO_Leg 6CTDBOT26 |             | 10_5           | 31,99     |
| 03-07-18   | 10:37:17 | 17,260931 | -63,573937 | CTD with samples | Bottom      | BOT         | NICO_Leg 6CTDBOT26 |             | 10_5           |           |
| 03-07-18   | 10:39:21 | 17,260933 | -63,573884 | CTD with samples | End         | END         | NICO_Leg 6CTDBOT34 |             | 10_5           | -1        |
| 03-07-18   | 11:41:06 | 17,261357 | -63,574037 | Mooring          | Recovery    | REC         | NICO_Leg 6MOOR37   | Pumpy       | 10_4           | -1        |
| 03-07-18   | 12:06:21 | 17,261833 | -63,57215  | CTD              | Begin       | BEGIN       | NICO_Leg 6CTD35    |             | 10_6           | -1        |
| 03-07-18   | 12:08:03 | 17,261833 | -63,57215  | CTD              | Bottom      | BOT         | NICO_Leg 6CTD36    |             | 10_6           | -1        |
| 03-07-18   | 12:10:50 | 17,261833 | -63,57215  | CTD              | Begin       | BEGIN       | NICO_Leg 6CTD37    |             | 10_6           | -1        |
| 03-07-18   | 12:26:17 | 17,261864 | -63,572218 | CTD              | Begin       | BEGIN       | NICO_Leg 6CTD28    |             | 10_7           | 31,41     |
| 03-07-18   | 12:26:54 | 17,261887 | -63,572228 | CTD              | Bottom      | BOT         | NICO_Leg 6CTD28    |             | 10_7           | 31,34     |
| 03-07-18   | 12:28:24 | 17,261912 | -63,572276 | CTD              | End         | END         | NICO_Leg 6CTD28    |             | 10_7           | 30,5      |
| 03-07-18   | 12:44:04 | 17,260119 | -63,574016 | CTD              | Begin       | BEGIN       | NICO_Leg 6CTD29    |             | 10_8           | 46        |

| Date     | Heure    | Latitude  | Longitude  | Device name      | Action name | Action code | Operation Id       | Observation | Station number | Depth (m) |
|----------|----------|-----------|------------|------------------|-------------|-------------|--------------------|-------------|----------------|-----------|
| 03-07-18 | 12:45:09 | 17,260102 | -63,574065 | CTD              | Bottom      | BOT         | NICO_Leg 6CTD29    |             | 10_8           | 46,6      |
| 03-07-18 | 12:46:59 | 17,260078 | -63,574268 | CTD              | End         | END         | NICO_Leg 6CTD29    |             | 10_8           | 40,29     |
| 03-07-18 | 12:59:57 | 17,261901 | -63,576209 | CTD              | Begin       | BEGIN       | NICO_Leg 6CTD30    |             | 10_9           | 26,06     |
| 03-07-18 | 13:00:51 | 17,261892 | -63,576133 | CTD              | Bottom      | BOT         | NICO_Leg 6CTD30    |             | 10_9           | 26,85     |
| 03-07-18 | 13:02:12 | 17,261886 | -63,576106 | CTD              | End         | END         | NICO_Leg 6CTD30    |             | 10_9           | 26,46     |
| 03-07-18 | 13:28:01 | 17,245432 | -63,580319 | Hopper Camera    | Begin       | BEGIN       | NICO_Leg 6HOPCAM33 |             | 233            | 95,64     |
| 03-07-18 | 13:29:31 | 17,245393 | -63,580583 | Hopper Camera    | Start track | START       | NICO_Leg 6HOPCAM33 |             | 233            | 84,04     |
| 03-07-18 | 14:10:57 | 17,249912 | -63,588716 | Hopper Camera    | End track   | END TRACK   | NICO_Leg 6HOPCAM33 |             | 233            | 24,68     |
| 03-07-18 | 14:14:02 | 17,250628 | -63,588875 | Hopper Camera    | End         | END         | NICO_Leg 6HOPCAM33 |             | 233            | 26,65     |
| 03-07-18 | 14:32:31 | 17,248357 | -63,594338 | Hopper Camera    | Begin       | BEGIN       | NICO_Leg 6HOPCAM34 |             | 234            | 30,1      |
| 03-07-18 | 14:32:38 | 17,248344 | -63,594346 | Hopper Camera    | Start track | START       | NICO_Leg 6HOPCAM34 |             | 234            | 31,08     |
| 03-07-18 | 14:55:06 | 17,251855 | -63,5922   | Hopper Camera    | End track   | END TRACK   | NICO_Leg 6HOPCAM34 |             | 234            | 28,61     |
| 03-07-18 | 14:56:47 | 17,251977 | -63,592219 | Hopper Camera    | End         | END         | NICO_Leg 6HOPCAM34 |             | 234            | 28,23     |
| 03-07-18 | 15:34:49 | 17,261579 | -63,574205 | Mooring          | Deployment  | DEP         | NICO_Leg 6MOOR28   | Pumpy       | 10_10          | 30,52     |
| 03-07-18 | 15:48:15 | 17,262668 | -63,575688 | CTD with samples | Begin       | BEGIN       | NICO_Leg 6CTDBOT27 |             | 10_11          | 25,95     |
| 03-07-18 | 15:49:16 | 17,262615 | -63,575639 | CTD with samples | Bottom      | BOT         | NICO_Leg 6CTDBOT27 |             | 10_11          | 26,28     |
| 03-07-18 | 15:56:47 | 17,262638 | -63,575437 | CTD with samples | End         | END         | NICO_Leg 6CTDBOT27 |             | 10_11          | 26,71     |
| 03-07-18 | 17:23:15 | 17,261628 | -63,573949 | Mooring          | Recovery    | REC         | NICO_Leg 6MOOR28   | Pumpy       | 10_10          | 29,01     |
| 03-07-18 | 18:22:53 | 17,261478 | -63,573973 | Mooring          | Deployment  | DEP         | NICO_Leg 6MOOR29   | Pumpy       | 10_12          | 28,03     |
| 03-07-18 | 18:48:22 | 17,261507 | -63,573064 | CTD with samples | Begin       | BEGIN       | NICO_Leg 6CTDBOT28 |             | 10_13          | 30,69     |
| 03-07-18 | 18:52:26 | 17,261516 | -63,573158 | CTD with samples | Bottom      | BOT         | NICO_Leg 6CTDBOT28 |             | 10_13          | 29,81     |
| 03-07-18 | 19:02:15 | 17,261382 | -63,572865 | CTD with samples | End         | END         | NICO_Leg 6CTDBOT28 |             | 10_13          | 33,72     |
| 03-07-18 | 19:50:01 | 17,261164 | -63,574006 | Mooring          | Recovery    | REC         | NICO_Leg 6MOOR29   | Pumpy       | 10_12          | 28,59     |
| 03-07-18 | 20:19:17 | 17,272566 | -63,548533 | Hopper Camera    | Begin       | BEGIN       | NICO_Leg 6HOPCAM35 |             | 235            | 21,33     |
| 03-07-18 | 20:20:51 | 17,272544 | -63,548457 | Hopper Camera    | Start track | START       | NICO_Leg 6HOPCAM35 |             | 235            | 21,25     |
| 03-07-18 | 20:56:17 | 17,273109 | -63,554161 | Hopper Camera    | End track   | END TRACK   | NICO_Leg 6HOPCAM35 |             | 235            | 25,76     |
| 03-07-18 | 20:58:54 | 17,273296 | -63,554356 | Hopper Camera    | End         | END         | NICO_Leg 6HOPCAM35 |             | 235            | 20,59     |
| 03-07-18 | 21:19:18 | 17,265947 | -63,544172 | Hopper Camera    | Begin       | BEGIN       | NICO_Leg 6HOPCAM36 |             | 236            | 19,93     |
| 03-07-18 | 21:21:06 | 17,265881 | -63,544023 | Hopper Camera    | Start track | START       | NICO_Leg 6HOPCAM36 |             | 236            | 20,92     |
| 03-07-18 | 21:50:48 | 17,263276 | -63,547087 | Hopper Camera    | End track   | END TRACK   | NICO_Leg 6HOPCAM36 |             | 236            | 22,85     |
| 03-07-18 | 22:00:06 | 17,265101 | -63,549018 | Hopper Camera    | End         | END         | NICO_Leg 6HOPCAM36 |             | 236            | 20,22     |
| 03-07-18 | 22:38:01 | 17,261748 | -63,574186 | Mooring          | Recovery    | REC         | NICO_Leg 6MOOR30   | EDCO        | 10_1           | 33,78     |
| 03-08-18 | 10:09:53 | 17,272909 | -63,552196 | Mooring          | Deployment  | DEP         | NICO_Leg 6MOOR31   | Pumpy       | 11_1           | 27,25     |
| 03-08-18 | 10:29:11 | 17,272963 | -63,553807 | Mooring          | Deployment  | DEP         | NICO_Leg 6MOOR32   | EDCO        | 11_2           | 26,27     |
| 03-08-18 | 10:46:56 | 17,272524 | -63,552221 | CTD with samples | Begin       | BEGIN       | NICO_Leg 6CTDBOT29 |             | 11_3           | 24,75     |
| 03-08-18 | 10:47:54 | 17,27252  | -63,552207 | CTD with samples | Bottom      | BOT         | NICO_Leg 6CTDBOT29 |             | 11_3           | 25,74     |
| 03-08-18 | 10:54:46 | 17,272533 | -63,552246 | CTD with samples | End         | END         | NICO_Leg 6CTDBOT29 |             | 11_3           | 25,1      |
| 03-08-18 | 11:36:30 | 17,273025 | -63,552146 | Mooring          | Recovery    | REC         | NICO_Leg 6MOOR32   | Pumpy       | 11_1           | 26,58     |
| 03-08-18 | 11:51:35 | 17,27485  | -63,553876 | CTD              | Begin       | BEGIN       | NICO_Leg 6CTD31    |             | 11_4           | 29,18     |
| 03-08-18 | 11:54:32 | 17,274868 | -63,553742 | CTD              | Bottom      | BOT         | NICO_Leg 6CTD31    |             | 11_4           | 27,66     |
| 03-08-18 | 11:55:46 | 17,274878 | -63,553678 | CTD              | End         | END         | NICO_Leg 6CTD31    |             | 11_4           | 27,83     |
| 03-08-18 | 12:07:54 | 17,272925 | -63,551839 | CTD              | Begin       | BEGIN       | NICO_Leg 6CTD32    |             | 11_5           | 22,33     |
| 03-08-18 | 12:08:25 | 17,272913 | -63,551826 | CTD              | Bottom      | BOT         | NICO_Leg 6CTD32    |             | 11_5           | 22,44     |
| 03-08-18 | 12:09:18 | 17,272899 | -63,551787 | CTD              | End         | END         | NICO_Leg 6CTD32    |             | 11_5           | 21,53     |
| 03-08-18 | 12:22:00 | 17,27125  | -63,553943 | CTD              | Begin       | BEGIN       | NICO_Leg 6CTD33    |             | 11_6           | 23,05     |
| 03-08-18 | 12:22:23 | 17,271206 | -63,55389  | CTD              | Bottom      | BOT         | NICO_Leg 6CTD33    |             | 11_6           | 23,33     |
| 03-08-18 | 12:23:26 | 17,271176 | -63,553703 | CTD              | End         | END         | NICO_Leg 6CTD33    |             | 11_6           | 23,92     |
| 03-08-18 | 12:36:49 | 17,273107 | -63,555611 | CTD              | Begin       | BEGIN       | NICO_Leg 6CTD34    |             | 11_7           | 27,47     |
| 03-08-18 | 12:37:28 | 17,273082 | -63,555611 | CTD              | Bottom      | BOT         | NICO_Leg 6CTD34    |             | 11_7           | 26,33     |
| 03-08-18 | 12:38:40 | 17,273086 | -63,555662 | CTD              | End         | END         | NICO_Leg 6CTD34    |             | 11_7           | 26,85     |
| 03-08-18 | 13:36:48 | 17,225191 | -63,591786 | Hopper Camera    | Begin       | BEGIN       | NICO_Leg 6HOPCAM37 |             | 237            | 23,31     |
| 03-08-18 | 13:36:50 | 17,225199 | -63,591769 | Hopper Camera    | Start track | START       | NICO_Leg 6HOPCAM37 |             | 237            | 23,94     |
| 03-08-18 | 14:58:07 | 17,228965 | -63,598513 | Hopper Camera    | End track   | END TRACK   | NICO_Leg 6HOPCAM37 |             | 237            | 23,32     |
| 03-08-18 | 14:58:47 | 17,229138 | -63,598534 | Hopper Camera    | End         | END         | NICO_Leg 6HOPCAM37 |             | 237            | 25,21     |
| 03-08-18 | 15:49:42 | 17,273114 | -63,552151 | Mooring          | Deployment  | DEP         | NICO_Leg 6MOOR33   | Pumpy       | 11_8           | 27,07     |
| 03-08-18 | 16:11:48 | 17,272832 | -63,551441 | CTD with samples | Begin       | BEGIN       | NICO_Leg 6CTDBOT30 |             | 11_9           | 20,51     |
| 03-08-18 | 16:15:35 | 17,272792 | -63,55163  | CTD with samples | Bottom      | BOT         | NICO_Leg 6CTDBOT30 |             | 11_9           | 20,66     |
| 03-08-18 | 16:23:11 | 17,272695 | -63,551717 | CTD with samples | End         | END         | NICO_Leg 6CTDBOT30 |             | 11_9           | 21,94     |
| 03-08-18 | 17:28:01 | 17,273242 | -63,551809 | Mooring          | Recovery    | REC         | NICO_Leg 6MOOR33   | Pumpy       | 11_8           | 25,22     |
| 03-08-18 | 18:39:22 | 17,297396 | -63,621177 | Boxcore          | Bottom      | BOT         | NICO_Leg 6BOX1257  |             | 12_1           | 35,14     |
| 03-08-18 | 19:17:08 | 17,297536 | -63,62123  | Boxcore          | Bottom      | BOT         | NICO_Leg 6BOX1258  |             | 12_2           | 34,86     |
| 03-08-18 | 21:02:09 | 17,273028 | -63,552151 | Mooring          | Deployment  | DEP         | NICO_Leg 6MOOR34   | Pumpy       | 11_10          | 26,66     |
| 03-08-18 | 21:22:41 | 17,272659 | -63,552124 | CTD with samples | Begin       | BEGIN       | NICO_Leg 6CTDBOT31 |             | 11_11          | 26,44     |
| 03-08-18 | 21:23:50 | 17,272711 | -63,552202 | CTD with samples | Bottom      | BOT         | NICO_Leg 6CTDBOT31 |             | 11_11          | 25,64     |
| 03-08-18 | 21:30:05 | 17,27261  | -63,552137 | CTD with samples | End         | END         | NICO_Leg 6CTDBOT31 |             | 11_11          | 25,47     |
| 03-08-18 | 22:36:41 | 17,273067 | -63,552086 | Mooring          | Recovery    | REC         | NICO_Leg 6MOOR34   | Pumpy       | 11_10          | 26,48     |
| 03-08-18 | 23:07:34 | 17,254532 | -63,513351 | Hopper Camera    | Begin       | BEGIN       | NICO_Leg 6HOPCAM38 |             | 238            | 58,04     |
| 03-08-18 | 23:11:01 | 17,254725 | -63,513456 | Hopper Camera    | Start track | START       | NICO_Leg 6HOPCAM38 |             | 238            | 47,78     |
| 03-09-18 | 0:13:10  | 17,262367 | -63,517884 | Hopper Camera    | End track   | END TRACK   | NICO_Leg 6HOPCAM38 |             | 238            | 23,32     |
| 03-09-18 | 0:18:25  | 17,263178 | -63,51815  | Hopper Camera    | End         | END         | NICO_Leg 6HOPCAM38 |             | 238            | 22,89     |
| 03-09-18 | 10:08:04 | 17,272992 | -63,552087 | Mooring          | Deployment  | DEP         | NICO_Leg 6MOOR35   | Pumpy       | 11_12          | 26,66     |

| Date       | Heure    | Latitude  | Longitude  | Device name      | Action name | Action code | Operation Id       | Observation | Station number | Depth (m) |
|------------|----------|-----------|------------|------------------|-------------|-------------|--------------------|-------------|----------------|-----------|
| 03-09-18   | 10:26:49 | 17,272534 | -63,552135 | CTD with samples | Begin       | BEGIN       | NICO_Leg 6CTDBOT32 |             | 11_13          | 25,17     |
| 03-09-18   | 10:29:02 | 17,272546 | -63,552138 | CTD with samples | Bottom      | BOT         | NICO_Leg 6CTDBOT32 |             | 11_13          | 25,1      |
| 03-09-18   | 10:36:25 | 17,272519 | -63,551996 | CTD with samples | End         | END         | NICO_Leg 6CTDBOT32 |             | 11_13          | 25,05     |
| 03-09-18   | 11:36:01 | 17,273066 | -63,552073 | Mooring          | Recovery    | REC         | NICO_Leg 6MOOR35   | Pumpy       | 11_12          | 26,23     |
| 03-09-18   | 11:48:54 | 17,273056 | -63,553848 | Mooring          | Recovery    | REC         | NICO_Leg 6MOOR35   | EDCO        | 11_2           | 26,91     |
| 03-09-18   | 12:34:06 | 17,254155 | -63,555253 | Boxcore          | Bottom      | BOT         | NICO_Leg 6BOX1259  |             | 13_1           | 308,1     |
| 03-09-18   | 13:22:54 | 17,254737 | -63,555639 | Boxcore          | Bottom      | BOT         | NICO_Leg 6BOX12510 |             | 13_2           | 301,11    |
| 03-09-18   | 17:15:23 | 17,271439 | -63,304568 | CTD with samples | Begin       | BEGIN       | NICO_Leg 6CTDBOT33 |             | 14_1           | 176,14    |
| 03-09-18   | 17:24:36 | 17,271597 | -63,304604 | CTD with samples | Bottom      | BOT         | NICO_Leg 6CTDBOT33 |             | 14_1           | 181,2     |
| 03-09-18   | 17:43:22 | 17,271931 | -63,304571 | CTD with samples | End         | END         | NICO_Leg 6CTDBOT33 |             | 14_1           | 154,64    |
| not logged |          |           |            |                  | Recovery    | REC         |                    |             | Thermistor SE  |           |
| 03-10-18   | 11:07:53 | 17,613969 | -63,475539 | CTD with samples | Begin       | BEGIN       | NICO_Leg 6CTDBOT35 |             | 15_1           | 199,2     |
| 03-10-18   | 11:14:18 | 17,613852 | -63,475472 | CTD with samples | Bottom      | BOT         | NICO_Leg 6CTDBOT35 |             | 15_1           | 197,92    |
| 03-10-18   | 11:30:54 | 17,613792 | -63,475645 | CTD with samples | End         | END         | NICO_Leg 6CTDBOT35 |             | 15_1           | 202,59    |
| 03-10-18   | 13:04:19 | 17,648184 | -63,545503 | Mooring          | Recovery    | REC         | NICO_Leg 6MOOR38   |             | Thermistor NW  | 491,1     |
| 03-10-18   | 14:41:17 | 17,686616 | -63,480281 | Hopper Camera    | Begin       | BEGIN       | NICO_Leg 6HOPCAM39 |             | 239            | 88,37     |
| 03-10-18   | 14:42:52 | 17,68657  | -63,480141 | Hopper Camera    | Start track | START       | NICO_Leg 6HOPCAM39 |             | 239            | 89,94     |
| 03-10-18   | 15:42:09 | 17,686458 | -63,470818 | Hopper Camera    | End track   | END TRACK   | NICO_Leg 6HOPCAM39 |             | 239            | 76,56     |
| 03-10-18   | 15:45:13 | 17,686487 | -63,470786 | Hopper Camera    | End         | END         | NICO_Leg 6HOPCAM39 |             | 239            | 76,72     |

## 5.2 Standard PUMPY sampling schedule

|                                          |                                       |
|------------------------------------------|---------------------------------------|
| <b>Cruise:</b> 64PE433                   | <b>Date:</b>                          |
| <b>Station:</b> PUMPY <b>Deployment:</b> | <b>Start time:</b>                    |
| <b>GoPRO:</b> Y                          | <b>Bottom depth PUMPY [m]:</b>        |
| <b>Latitude:</b>                         | <b>Aquadopp:</b> Y <b>MicrocaT:</b> Y |
| <b>Longitude:</b>                        |                                       |

| NISKIN bottle | Sampling depth [cm ab]] | NUTS | TP | pH | DIC+ Alkalinity | TOC TN | POM | Flow cytometry | Metabolomics Metagenomics | Remarks |
|---------------|-------------------------|------|----|----|-----------------|--------|-----|----------------|---------------------------|---------|
| 1             | 10                      | X    | X  |    | X               | X      | X   | X              | X                         |         |
| 2             | 20                      | X    | X  |    | X               | X      | X   | X              |                           |         |
| 3             | 40                      | X    | X  |    | X               |        | X   | X              |                           |         |
| 4             | 80                      | X    | X  |    | X               | X      | X   | X              | X                         |         |
| 5             | 160                     | X    | X  |    | X               |        | X   | X              |                           |         |
| 6             | 300                     | X    | X  |    | X               | X      | X   | X              |                           |         |

Standard variables sampled of PUMPY in case there was sufficient water in all six bags.

## 5.3 CTD sampling schedules

|                                       |                                   |
|---------------------------------------|-----------------------------------|
| <b>Cruise:</b> 64PE433                | <b>Date:</b> 26 Feb 2018          |
| <b>Station:</b> 01 <b>Cast:</b> 01    | <b>Start time (UTC):</b> 21:30    |
| <b>CTD file name*:</b> PE433 _ S01C01 | <b>Bottom depth CTD [m]:</b> 325  |
|                                       | <b>Altimeter at bottom [m]:</b> 5 |
| <b>Latitude:</b> 17° 39,761' N        | <b>CTD operator:</b> Bob          |
| <b>Longitude:</b> 63° 14,488' W       | <b>Sample:</b> Saba               |

| NISKIN bottle | Sampling depth [m]    | NUTS | TP | DIC | Alkalinity | TOC TN | POM | Flow cytometry | Micro zooplankton | Metabolomics Metagenomics | Remarks |
|---------------|-----------------------|------|----|-----|------------|--------|-----|----------------|-------------------|---------------------------|---------|
| 1             | Profile for Multibeam |      |    |     |            |        |     |                |                   |                           |         |

|                                       |                                   |
|---------------------------------------|-----------------------------------|
| <b>Cruise:</b> 64PE433                | <b>Date:</b> 27 Feb 2018          |
| <b>Station:</b> 02 <b>Cast:</b> 01    | <b>Start time (UTC):</b> 11:09    |
| <b>CTD file name*:</b> PE433 _ S02C02 | <b>Bottom depth CTD [m]:</b> 335  |
|                                       | <b>Altimeter at bottom [m]:</b> 5 |
| <b>Latitude:</b> 17° 33,328' N        | <b>CTD operator:</b> Bob          |
| <b>Longitude:</b> 62° 58,776' W       | <b>Sample:</b> St Eustatius       |

| NISKIN bottle | Sampling depth [m]    | NUTS | TP | DIC | Alkalinity | TOC TN | POM | Flow cytometry | Micro zooplankton | Metabolomics Metagenomics | Remarks                                              |
|---------------|-----------------------|------|----|-----|------------|--------|-----|----------------|-------------------|---------------------------|------------------------------------------------------|
| 1             | Profile for Multibeam |      |    |     |            |        |     |                |                   |                           | Note that Stn nr (Casina) differs from CTD file name |

|                                       |                                   |
|---------------------------------------|-----------------------------------|
| <b>Cruise:</b> 64PE433                | <b>Date:</b> 27 Feb 2018          |
| <b>Station:</b> 03 <b>Cast:</b> 01    | <b>Start time (UTC):</b> 20:56    |
| <b>CTD file name*:</b> PE433 _ S03C01 | <b>Bottom depth CTD [m]:</b> 337  |
|                                       | <b>Altimeter at bottom [m]:</b> 4 |
| <b>Latitude:</b> 17° 15,620' N        | <b>CTD operator:</b> Bob          |
| <b>Longitude:</b> 63° 22,913' W       | <b>Sample:</b> Saba Bank          |

| NISKIN bottle | Sampling depth [m] | NUTS | TP   | DIC | Alkalinity | TOC TN | POM | Flow cytometry | Micro zooplankton | Metabolomics Metagenomics | Remarks |
|---------------|--------------------|------|------|-----|------------|--------|-----|----------------|-------------------|---------------------------|---------|
| 1             | 330                |      |      |     | X          |        |     |                |                   |                           |         |
| 2             | 199                |      |      |     |            |        |     | X              |                   |                           |         |
| 3             | 140                |      |      |     |            |        |     | X              |                   |                           |         |
| 4             | 60                 | X    |      |     |            |        |     | X              |                   | X                         |         |
| 5             | 60                 |      | dmsp |     |            |        | X   |                |                   |                           |         |
| 6             | 40                 |      |      |     |            |        |     | X              |                   |                           |         |
| 7             | 15                 | X    |      |     |            |        |     | X              |                   | X                         |         |
| 8             | 15                 |      | dmsp |     |            |        | X   |                |                   |                           |         |
| 9             | 3                  |      |      |     | X          |        |     |                |                   |                           |         |
| 10            | 3                  | X    | dmsp |     |            |        | X   | X              |                   |                           |         |

Remarks: also used for multibeam correction for Saba Bank (Bob). **This was a NICO-student site.**

|                                |          |                            |
|--------------------------------|----------|----------------------------|
| Cruise: 64PE433                |          | Date: 28 Feb 2018          |
| Station: 04                    | Cast: 03 | Start time (UTC): 17:18    |
| CTD file name*: PE433 _ S04C03 |          | Bottom depth CTD [m]: 30   |
|                                |          | Altimeter at bottom [m]: 4 |
| Latitude: 17° 20,016' N        |          | CTD operator: Bob          |
| Longitude: 63° 15,239' W       |          | Sample: Saba Bank          |

| NISKIN bottle | Sampling depth [m] | NUTS | TP | DIC | Alkalinity | TOC TN | POM | Flow cytometry | Micro zooplankton | Metabolomics Metagenomics | Remarks |
|---------------|--------------------|------|----|-----|------------|--------|-----|----------------|-------------------|---------------------------|---------|
| 1             | 23                 | X    |    | X   | X          |        |     |                |                   |                           |         |
| 2             | 23                 |      |    |     |            | X      | X   | X              | X                 |                           |         |
| 3             | 16                 | X    |    | X   | X          |        |     |                |                   |                           |         |
| 4             | 16                 |      |    |     |            |        | X   | X              |                   |                           |         |
| 5             | 12                 | X    |    | X   | X          |        |     |                |                   |                           |         |
| 6             | 12                 |      |    |     |            |        |     |                |                   |                           |         |
| 7             | 3                  | X    |    | X   | X          |        |     |                |                   |                           |         |
| 8             | 3                  |      |    |     |            | X      | X   | X              | X                 | X                         |         |

|                                       |                 |                                   |  |
|---------------------------------------|-----------------|-----------------------------------|--|
| <b>Cruise:</b> 64PE433                |                 | <b>Date:</b> 28 Feb 2018          |  |
| <b>Station:</b> 04                    | <b>Cast:</b> 04 | <b>Start time (UTC):</b> 18:13    |  |
| <b>CTD file name*:</b> PE433 _ S04C04 |                 | <b>Bottom depth CTD [m]:</b> 25   |  |
|                                       |                 | <b>Altimeter at bottom [m]:</b> 3 |  |
| <b>Latitude:</b> 17° 20,028' N        |                 | <b>CTD operator:</b> Bob          |  |
| <b>Longitude:</b> 63° 15,252' W       |                 | <b>Sample:</b> Saba Bank          |  |

|                                              |                            |
|----------------------------------------------|----------------------------|
| <b>Cruise:</b> 64PE433                       | <b>Date:</b> 28 Feb 2018   |
| Station: 04                      Cast: 05    | Start time (UTC): 18:33    |
| <b>CTD file name*:</b> PE433        _ S04C05 | Bottom depth CTD [m]: 35   |
|                                              | Altimeter at bottom [m]: 2 |
| <b>Latitude:</b> 17° 20,149' N               | CTD operator: Bob          |
| <b>Longitude:</b> 63° 15,361' W              | <b>Sample:</b> Saba Bank   |

|                                       |  |                            |  |
|---------------------------------------|--|----------------------------|--|
| <b>Cruise:</b> 64PE433                |  | <b>Date:</b> 28 Feb 2018   |  |
| Station: 04                           |  | Start time (UTC): 18:54    |  |
| Cast: 06                              |  |                            |  |
| <b>CTD file name*:</b> PE433 _ S04C06 |  | Bottom depth CTD [m]: 23   |  |
|                                       |  | Altimeter at bottom [m]: 1 |  |
| <b>Latitude:</b> 17° 19,931' N        |  | CTD operator: Bob          |  |
| <b>Longitude:</b> 63° 15,361' W       |  | <b>Sample:</b> Saba Bank   |  |

|                                       |          |                            |
|---------------------------------------|----------|----------------------------|
| <b>Cruise:</b> 64PE433                |          | <b>Date:</b> 28 Feb 2018   |
| Station: 04                           | Cast: 07 | Start time (UTC): 19:19    |
| <b>CTD file name*:</b> PE433 _ S04C07 |          | Bottom depth CTD [m]: 16   |
|                                       |          | Altimeter at bottom [m]: 2 |
| <b>Latitude:</b> 17° 20,029' N        |          | CTD operator: Bob          |
| <b>Longitude:</b> 63° 15,481' W       |          | <b>Sample:</b> Saba Bank   |

|                                       |          |                            |  |
|---------------------------------------|----------|----------------------------|--|
| <b>Cruise:</b> 64PE433                |          | <b>Date:</b> 28 Feb 2018   |  |
| Station: 04                           | Cast: 12 | Start time (UTC): 20:56    |  |
| <b>CTD file name*:</b> PE433 _ S04C12 |          | Bottom depth CTD [m]: 35   |  |
|                                       |          | Altimeter at bottom [m]: 4 |  |
| <b>Latitude:</b> 17° 20,004' N        |          | CTD operator: Bob          |  |
| <b>Longitude:</b> 63° 15,236' W       |          | <b>Sample:</b> Saba Bank   |  |

| NISKIN bottle | Sampling depth [m] | NUTS | TP | DIC | Alkalinity | TOC TN | POM | Flow cytometry | Micro zooplankton | Metabolomics Metagenomics | Remarks              |
|---------------|--------------------|------|----|-----|------------|--------|-----|----------------|-------------------|---------------------------|----------------------|
| 1             | 26                 | X    | X  | X   | X          |        |     |                |                   |                           |                      |
| 2             | 26                 |      |    |     |            | X      | X   | X              | X                 |                           |                      |
| 3             | 20                 | X    | X  | X   | X          |        |     |                |                   |                           |                      |
| 4             | 20                 |      |    |     |            |        | X   | X              |                   |                           |                      |
| 5             | 12                 | X    | X  | X   | X          |        |     |                |                   |                           |                      |
| 6             | 12                 |      |    |     |            |        |     |                |                   |                           | Fles 6 niet gesloten |
| 7             | 3                  | X    | X  | X   | X          |        |     |                |                   |                           |                      |
| 8             | 3                  |      |    |     |            | X      | X   | X              | X                 | X                         |                      |

|                                       |  |  |  |  |  |                            |  |  |  |  |  |
|---------------------------------------|--|--|--|--|--|----------------------------|--|--|--|--|--|
| <b>Cruise:</b> 64PE433                |  |  |  |  |  | <b>Date:</b> 1 March 2018  |  |  |  |  |  |
| Station: 04      Cast: 14             |  |  |  |  |  | Start time (UTC): 10:31    |  |  |  |  |  |
| <b>CTD file name*:</b> PE433 _ S04C14 |  |  |  |  |  | Bottom depth CTD [m]: 38   |  |  |  |  |  |
|                                       |  |  |  |  |  | Altimeter at bottom [m]: 2 |  |  |  |  |  |
| <b>Latitude:</b> 17° 20,004' N        |  |  |  |  |  | CTD operator: Bob          |  |  |  |  |  |
| <b>Longitude:</b> 63° 15,235' W       |  |  |  |  |  | <b>Sample:</b> Saba Bank   |  |  |  |  |  |

| NISKIN bottle | Sampling depth [m] | NUTS | TP | DIC | Alkalinity | TOC TN | POM | Flow cytometry | Micro zooplankton | Metabolomics Metagenomics | Remarks |
|---------------|--------------------|------|----|-----|------------|--------|-----|----------------|-------------------|---------------------------|---------|
| 1             | 28                 | X    | X  | X   | X          |        |     |                |                   |                           |         |
| 2             | 28                 |      |    |     |            | X      | X   | X              |                   |                           |         |
| 3             | 22                 | X    | X  | X   | X          |        |     |                |                   |                           |         |
| 4             | 22                 |      |    |     |            |        | X   | X              |                   |                           |         |
| 5             | 12                 | X    | X  | X   | X          |        |     |                |                   |                           |         |
| 6             | 12                 |      |    |     |            |        |     |                |                   |                           |         |
| 7             | 3                  | X    | X  | X   | X          |        |     |                |                   |                           |         |
| 8             | 3                  |      |    |     |            | X      | X   | X              |                   | X                         |         |

|                                       |  |  |  |  |  |                            |  |  |  |  |  |
|---------------------------------------|--|--|--|--|--|----------------------------|--|--|--|--|--|
| <b>Cruise:</b> 64PE433                |  |  |  |  |  | <b>Date:</b> 1 March 2018  |  |  |  |  |  |
| Station: 04      Cast: 15             |  |  |  |  |  | Start time (UTC): 11:07    |  |  |  |  |  |
| <b>CTD file name*:</b> PE433 _ S04C15 |  |  |  |  |  | Bottom depth CTD [m]: 250  |  |  |  |  |  |
|                                       |  |  |  |  |  | Altimeter at bottom [m]: 4 |  |  |  |  |  |
| <b>Latitude:</b> 17° 20,028' N        |  |  |  |  |  | CTD operator: Bob          |  |  |  |  |  |
| <b>Longitude:</b> 63° 14,963' W       |  |  |  |  |  | <b>Sample:</b> Saba Bank   |  |  |  |  |  |

| NISKIN bottle | Sampling depth [m] | NUTS | TP | DIC | Alkalinity | TOC TN | POM | Flow cytometry | Micro zooplankton | Metabolomics Metagenomics | Remarks |
|---------------|--------------------|------|----|-----|------------|--------|-----|----------------|-------------------|---------------------------|---------|
| 1             | 199                | X    |    | X   | X          |        |     |                |                   |                           |         |
| 2             | 40                 | X    |    | X   | X          |        |     |                |                   |                           |         |
| 3             | 40                 |      |    |     |            |        |     |                |                   |                           |         |
| 4             | 27                 | X    |    | X   | X          |        |     |                |                   |                           |         |
| 5             | 27                 |      |    |     |            |        |     |                |                   |                           |         |
| 6             | 15                 | X    |    | X   | X          |        |     |                |                   |                           |         |
| 7             | 15                 |      |    |     |            |        |     |                |                   |                           |         |
| 8             | 3                  | X    |    | X   | X          |        |     |                |                   |                           |         |
| 9             | 3                  |      |    |     |            |        |     |                |                   |                           |         |

|                                       |  |  |  |  |  |                            |  |  |  |  |  |
|---------------------------------------|--|--|--|--|--|----------------------------|--|--|--|--|--|
| <b>Cruise:</b> 64PE433                |  |  |  |  |  | <b>Date:</b> 1 March 2018  |  |  |  |  |  |
| Station: 04      Cast: 19             |  |  |  |  |  | Start time (UTC): 17:16    |  |  |  |  |  |
| <b>CTD file name*:</b> PE433 _ S04C19 |  |  |  |  |  | Bottom depth CTD [m]: 31   |  |  |  |  |  |
|                                       |  |  |  |  |  | Altimeter at bottom [m]: 2 |  |  |  |  |  |
| <b>Latitude:</b> 17° 19,994' N        |  |  |  |  |  | CTD operator: Bob          |  |  |  |  |  |
| <b>Longitude:</b> 63° 15,245' W       |  |  |  |  |  | <b>Sample:</b> Saba Bank   |  |  |  |  |  |

| NISKIN bottle | Sampling depth [m] | NUTS | TP | DIC | Alkalinity | TOC TN | POM | Flow cytometry | Micro zooplankton | Metabolomics Metagenomics | Remarks |
|---------------|--------------------|------|----|-----|------------|--------|-----|----------------|-------------------|---------------------------|---------|
| 1             | 22                 | X    | X  | X   | X          | X      |     |                |                   |                           |         |
| 2             | 22                 |      |    |     |            |        | X   | X              |                   |                           |         |
| 3             | 15                 | X    | X  | X   | X          |        |     |                |                   |                           |         |
| 4             | 15                 |      |    |     |            |        | X   | X              |                   |                           |         |
| 5             | 3                  | X    | X  | X   | X          | X      |     |                |                   |                           |         |
| 6             | 3                  |      |    |     |            |        | X   | X              |                   | X                         |         |

|                                       |  |  |  |  |  |                            |  |  |  |  |  |
|---------------------------------------|--|--|--|--|--|----------------------------|--|--|--|--|--|
| <b>Cruise:</b> 64PE433                |  |  |  |  |  | <b>Date:</b> 1 March 2018  |  |  |  |  |  |
| Station: 05      Cast: 03             |  |  |  |  |  | Start time (UTC): 21:25    |  |  |  |  |  |
| <b>CTD file name*:</b> PE433 _ S05C03 |  |  |  |  |  | Bottom depth CTD [m]: 16   |  |  |  |  |  |
|                                       |  |  |  |  |  | Altimeter at bottom [m]: 2 |  |  |  |  |  |
| Latitude:                             |  |  |  |  |  | CTD operator: Bob          |  |  |  |  |  |
| Longitude:                            |  |  |  |  |  | <b>Sample:</b> Saba Bank   |  |  |  |  |  |

| NISKIN bottle | Sampling depth [m] | NUTS | TP | DIC | Alkalinity | TOC TN | POM | Flow cytometry | Micro zooplankton | Metabolomics Metagenomics | Remarks |
|---------------|--------------------|------|----|-----|------------|--------|-----|----------------|-------------------|---------------------------|---------|
| 1             | 13                 | X    | X  | X   | X          |        |     |                |                   |                           |         |
| 2             | 13                 |      |    |     |            | X      | X   | X              |                   |                           |         |
| 3             | 3                  | X    | X  | X   | X          |        |     |                |                   |                           |         |
| 4             | 3                  |      |    |     |            | X      | X   | X              |                   |                           |         |

|                                       |                            |
|---------------------------------------|----------------------------|
| <b>Cruise:</b> 64PE433                | <b>Date:</b> 3 March 2018  |
| Station: 05      Cast: 04             | Start time (UTC): 22:57    |
| <b>CTD file name*:</b> PE433 _ S05C04 | Bottom depth CTD [m]: 21   |
|                                       | Altimeter at bottom [m]: 3 |
| <b>Latitude:</b> 17° 23,099' N        | CTD operator: Emil         |
| <b>Longitude:</b> 63° 17,418' W       | <b>Sample:</b> Saba Bank   |

Remark: O2 downcast different from O2 upcast....

|                                       |                            |
|---------------------------------------|----------------------------|
| <b>Cruise:</b> 64PE433                | <b>Date:</b> 3 March 2018  |
| Station: 05      Cast: 05             | Start time (UTC): 23:09    |
| <b>CTD file name*:</b> PE433 _ S05C05 | Bottom depth CTD [m]: 21   |
|                                       | Altimeter at bottom [m]: 2 |
| <b>Latitude:</b> 17° 22,984' N        | CTD operator: Emil         |
| <b>Longitude:</b> 63° 17,308' W       | <b>Sample:</b> Saba Bank   |

Remark: O2 downcast different from O2 upcast....

|                                       |                              |
|---------------------------------------|------------------------------|
| <b>Cruise:</b> 64PE433                | <b>Date:</b> 3 March 2018    |
| Station: 05      Cast: 06             | Start time (UTC): 23:26      |
| <b>CTD file name*:</b> PE433 _ S05C06 | Bottom depth CTD [m]: 17     |
|                                       | Altimeter at bottom [m]: 3.1 |
| <b>Latitude:</b> 17° 22,874' N        | CTD operator: Emil           |
| <b>Longitude:</b> 63° 17,424' W       | <b>Sample:</b> Saba Bank     |

|                                       |                              |
|---------------------------------------|------------------------------|
| <b>Cruise:</b> 64PE433                | <b>Date:</b> 3 March 2018    |
| Station: 05      Cast: 07             | Start time (UTC): 23:39      |
| <b>CTD file name*:</b> PE433 _ S05C07 | Bottom depth CTD [m]: 17     |
|                                       | Altimeter at bottom [m]: 2.5 |
| <b>Latitude:</b> 17° 22,991' N        | CTD operator: Emil           |
| <b>Longitude:</b> 63° 17,534' W       | <b>Sample:</b> Saba Bank     |

|                                       |                           |
|---------------------------------------|---------------------------|
| <b>Cruise:</b> 64PE433                | <b>Date:</b> 2 March 2018 |
| Station: 05      Cast: 09             | Start time (UTC): 10:31   |
| <b>CTD file name*:</b> PE433 _ S05C09 | Bottom depth CTD [m]: 16  |
|                                       | Altimeter at bottom [m]:  |
| <b>Latitude:</b> 17° 23,024' N        | CTD operator: Bob         |
| <b>Longitude:</b> 63° 17,446' W       | <b>Sample:</b> Saba Bank  |

| NISKIN bottle | Sampling depth [m] | NUTS | TP | DIC | Alkalinity | TOC TN | POM | Flow cytometry | Micro zooplankton | Metabolomics Metagenomics | Remarks |
|---------------|--------------------|------|----|-----|------------|--------|-----|----------------|-------------------|---------------------------|---------|
| 1             | 15                 | X    | X  | X   | X          |        |     |                |                   |                           |         |
| 2             | 15                 |      |    |     |            | X      | X   | X              |                   |                           |         |
| 3             | 3                  | X    | X  | X   | X          |        |     |                |                   |                           |         |
| 4             | 3                  |      |    |     |            | X      | X   | X              |                   | X                         |         |

|                                       |                           |
|---------------------------------------|---------------------------|
| <b>Cruise:</b> 64PE433                | <b>Date:</b> 2 March 2018 |
| Station: 05      Cast: 11             | Start time (UTC):         |
| <b>CTD file name*:</b> PE433 _ S05C11 | Bottom depth CTD [m]: 16  |
|                                       | Altimeter at bottom [m]:  |
| <b>Latitude:</b>                      | CTD operator: Bob         |
| <b>Longitude:</b>                     | <b>Sample:</b> Saba Bank  |

| NISKIN bottle | Sampling depth [m] | NUTS | TP | DIC | Alkalinity | TOC TN | POM | Flow cytometry | Micro zooplankton | Metabolomics Metagenomics | Remarks |
|---------------|--------------------|------|----|-----|------------|--------|-----|----------------|-------------------|---------------------------|---------|
| 1             | 15                 | X    | X  | X   | X          |        |     |                |                   |                           |         |
| 2             | 15                 |      |    |     |            | X      | X   | X              | X                 |                           |         |
| 3             | 3                  | X    | X  | X   | X          |        |     |                |                   |                           |         |
| 4             | 3                  |      |    |     |            | X      | X   | X              | X                 | X                         |         |

|                                       |                            |
|---------------------------------------|----------------------------|
| <b>Cruise:</b> 64PE433                | <b>Date:</b> 2 March 2018  |
| Station: 05      Cast: 18             | Start time (UTC): 21:15    |
| <b>CTD file name*:</b> PE433 _ S05C18 | Bottom depth CTD [m]:      |
|                                       | Altimeter at bottom [m]: 1 |
| <b>Latitude:</b> 17° 23,050' N        | CTD operator: Alice        |
| <b>Longitude:</b> 63° 17,436' W       | <b>Sample:</b> Saba Bank   |

| NISKIN bottle | Sampling depth [m] | NUTS | TP | DIC | Alkalinity | TOC TN | POM | Flow cytometry | Micro zooplankton | Metabolomics Metagenomics | Remarks |
|---------------|--------------------|------|----|-----|------------|--------|-----|----------------|-------------------|---------------------------|---------|
| 1             | 14                 | X    | X  | X   | X          |        |     |                |                   |                           |         |
| 2             | 14                 |      |    |     |            | X      | X   | X              |                   |                           |         |
| 3             | 3                  | X    | X  | X   | X          |        |     |                |                   |                           |         |
| 4             | 3                  |      |    |     |            | X      | X   | X              |                   |                           |         |

|                                       |                            |
|---------------------------------------|----------------------------|
| <b>Cruise:</b> 64PE433                | <b>Date:</b> 3 March 2018  |
| Station: 06      Cast: 03             | Start time (UTC): 10:51    |
| <b>CTD file name*:</b> PE433 _ S06C03 | Bottom depth CTD [m]: 24   |
|                                       | Altimeter at bottom [m]: 3 |
| <b>Latitude:</b> 17° 29,003' N        | CTD operator: Bob          |
| <b>Longitude:</b> 63° 23,306' W       | <b>Sample:</b> Saba Bank   |

| NISKIN bottle | Sampling depth [m] | NUTS | TP | DIC | Alkalinity | TOC TN | POM | Flow cytometry | Micro zooplankton | Metabolomics Metagenomics | Remarks |
|---------------|--------------------|------|----|-----|------------|--------|-----|----------------|-------------------|---------------------------|---------|
| 1             | 23                 | X    | X  | X   | X          |        |     |                |                   |                           |         |
| 2             | 23                 |      |    |     |            | X      | X   | X              |                   |                           |         |
| 3             | 18                 | X    | X  | X   | X          |        |     | X              |                   |                           |         |
| 4             | 18                 |      |    |     |            |        | X   | X              |                   |                           |         |
| 5             | 15                 | X    |    |     |            |        |     | X              |                   |                           |         |
| 6             | 15                 | X    |    |     |            |        |     | X              |                   | X                         |         |
| 7             | 3                  | X    | X  | X   | X          |        |     |                |                   |                           |         |
| 8             | 3                  |      |    |     |            | X      | X   | X              |                   | X                         |         |
| 9             | 3                  | X    |    |     |            |        |     | X              |                   |                           |         |

Remarks: This was a NICO-student site (blue samples) and also sampled by others

|                                       |                           |
|---------------------------------------|---------------------------|
| <b>Cruise:</b> 64PE433                | <b>Date:</b> 3 March 2018 |
| Station: 06      Cast: 05             | Start time (UTC): 17:07   |
| <b>CTD file name*:</b> PE433 _ S06C05 | Bottom depth CTD [m]: 24  |
|                                       | Altimeter at bottom [m]:  |
| <b>Latitude:</b> 17° 29,002' N        | CTD operator: Alice       |
| <b>Longitude:</b> 63° 23,303' W       | <b>Sample:</b> Saba Bank  |

| NISKIN bottle | Sampling depth [m] | NUTS | TP | DIC | Alkalinity | TOC TN | POM | Flow cytometry | Micro zooplankton | Metabolomics Metagenomics | Remarks |
|---------------|--------------------|------|----|-----|------------|--------|-----|----------------|-------------------|---------------------------|---------|
| 1             | 22                 | X    | X  | X   | X          |        |     |                |                   |                           |         |
| 2             | 22                 |      |    |     |            | X      | X   | X              | X                 |                           |         |
| 3             | 17                 | X    | X  | X   | X          |        |     |                |                   |                           |         |
| 4             | 17                 |      |    |     |            |        | X   | X              |                   |                           |         |
| 5             | 3                  | X    | X  | X   | X          |        |     |                |                   |                           |         |
| 6             | 3                  |      |    |     |            | X      | X   | X              | X                 | X                         |         |

Missing CTD sheets Stn 06-06, 06-07, 06-08, 06-09 (Emil cross)

|                                       |                            |
|---------------------------------------|----------------------------|
| <b>Cruise:</b> 64PE433                | <b>Date:</b> 3 March 2018  |
| Station: 06      Cast: 11             | Start time (UTC): 21:12    |
| <b>CTD file name*:</b> PE433 _ S06C05 | Bottom depth CTD [m]: 24.6 |
|                                       | Altimeter at bottom [m]:   |
| <b>Latitude:</b> 17° 28,975' N        | CTD operator: Alice        |
| <b>Longitude:</b> 63° 23,237' W       | <b>Sample:</b> Saba Bank   |

| NISKIN bottle | Sampling depth [m] | NUTS | TP | DIC | Alkalinity | TOC TN | POM | Flow cytometry | Micro zooplankton | Metabolomics Metagenomics | Remarks |
|---------------|--------------------|------|----|-----|------------|--------|-----|----------------|-------------------|---------------------------|---------|
| 1             | 22                 | X    | X  | X   | X          |        |     |                |                   |                           |         |
| 2             | 22                 |      |    |     |            | X      | X   | X              |                   |                           |         |
| 3             | 18                 | X    | X  | X   | X          |        |     |                |                   |                           |         |
| 4             | 18                 |      |    |     |            |        | X   | X              |                   |                           |         |
| 5             | 3                  | X    | X  | X   | X          |        |     |                |                   |                           |         |
| 6             | 3                  |      |    |     |            | X      | X   | X              |                   |                           |         |

|                                      |                              |
|--------------------------------------|------------------------------|
| <b>Cruise:</b> 64PE433               | <b>Date:</b> 3 March 2018    |
| Station: 06      Cast: 13            | Start time (UTC):            |
| <b>CTD file name*:</b> PE433 _S06C13 | Bottom depth CTD [m]: 21     |
|                                      | Altimeter at bottom [m]: 25? |
| <b>Latitude:</b> 17° 28,982' N       | CTD operator: Alice          |
| <b>Longitude:</b> 63° 23,234' W      | <b>Sample:</b> Saba Bank     |

| NISKIN bottle | Sampling depth [m] | NUTS | TP | DIC | Alkalinity | TOC TN | POM | Flow cytometry | Micro zooplankton | Metabolomics Metagenomics | Remarks |
|---------------|--------------------|------|----|-----|------------|--------|-----|----------------|-------------------|---------------------------|---------|
| 1             | 21                 | X    | X  | X   | X          |        |     |                |                   |                           |         |
| 2             | 21                 |      |    |     |            | X      | X   | X              |                   |                           |         |
| 3             | 17                 | X    | X  | X   | X          |        |     |                |                   |                           |         |
| 4             | 17                 |      |    |     |            |        | X   | X              |                   |                           |         |
| 5             | 3                  | X    | X  | X   | X          | X      | X   | X              |                   |                           |         |
| 6             | 3                  |      |    |     |            |        |     |                |                   |                           |         |

|                                     |                           |
|-------------------------------------|---------------------------|
| <b>Cruise:</b> 64PE433              | <b>Date:</b> 4 March 2018 |
| Station: 07      Cast: 3 and 4      | Start time (UTC): 17:30   |
| <b>CTD file name*:</b> PE433 _S07C4 | Bottom depth CTD [m]: 34  |
|                                     | Altimeter at bottom [m]:  |
| <b>Latitude:</b> 17° 25,246' N      | CTD operator: Alice       |
| <b>Longitude:</b> 63° 33,750' W     | <b>Sample:</b> Saba Bank  |

| NISKIN bottle | Sampling depth [m] | NUTS | TP | DIC | Alkalinity | TOC TN | POM | Flow cytometry | Micro zooplankton | Metabolomics Metagenomics | Remarks    |
|---------------|--------------------|------|----|-----|------------|--------|-----|----------------|-------------------|---------------------------|------------|
| 1             | 28                 | X    | X  | X   | X          |        |     |                |                   |                           |            |
| 2             | 28                 |      |    |     |            | X      | X   | X              |                   |                           |            |
| 3             | 23                 | X    | X  | X   | X          |        |     |                |                   |                           |            |
| 4             | 23                 |      |    |     |            |        | X   | X              |                   |                           |            |
| 5             | 15                 | X    | X  | X   | X          |        |     |                |                   |                           |            |
| 6             | 15                 |      |    |     |            |        |     |                |                   |                           | Not closed |
| 7             | 3                  | X    | X  | X   | X          |        |     |                |                   |                           |            |
| 8             | 3                  |      |    |     |            | X      | X   | X              | X                 | X                         |            |

Remark: bottles 1-6 closed during cast 3. Bottles 7 and 8 were closed during cast 4

|                                      |                              |
|--------------------------------------|------------------------------|
| <b>Cruise:</b> 64PE433               | <b>Date:</b> 4 March 2018    |
| Station: 07      Cast: 05            | Start time (UTC): 18:29      |
| <b>CTD file name*:</b> PE433 _S07C05 | Bottom depth CTD [m]: 34     |
|                                      | Altimeter at bottom [m]: 2,5 |
| <b>Latitude:</b> 17° 25,184' N       | CTD operator: Emil           |
| <b>Longitude:</b> 63° 33,755' W      | <b>Sample:</b> Saba Bank     |

|                                      |                              |
|--------------------------------------|------------------------------|
| <b>Cruise:</b> 64PE433               | <b>Date:</b> 4 March 2018    |
| Station: 07      Cast: 06            | Start time (UTC): 18:49      |
| <b>CTD file name*:</b> PE433 _S07C06 | Bottom depth CTD [m]: 35     |
|                                      | Altimeter at bottom [m]: 4,2 |
| <b>Latitude:</b> 17° 25,292' N       | CTD operator: Emil           |
| <b>Longitude:</b> 63° 33,875' W      | <b>Sample:</b> Saba Bank     |

|                                      |                            |
|--------------------------------------|----------------------------|
| <b>Cruise:</b> 64PE433               | <b>Date:</b> 4 March 2018  |
| Station: 07      Cast: 07            | Start time (UTC): 19:04    |
| <b>CTD file name*:</b> PE433 _S07C07 | Bottom depth CTD [m]: 34   |
|                                      | Altimeter at bottom [m]: 4 |
| <b>Latitude:</b> 17° 25,406' N       | CTD operator: Emil         |
| <b>Longitude:</b> 63° 33,762' W      | <b>Sample:</b> Saba Bank   |

|                                      |                            |
|--------------------------------------|----------------------------|
| <b>Cruise:</b> 64PE433               | <b>Date:</b> 4 March 2018  |
| Station: 07      Cast: 08            | Start time (UTC): 19:28    |
| <b>CTD file name*:</b> PE433 _S07C08 | Bottom depth CTD [m]: 34   |
|                                      | Altimeter at bottom [m]: 2 |
| <b>Latitude:</b> 17° 25,291' N       | CTD operator: Emil         |
| <b>Longitude:</b> 63° 33,650' W      | <b>Sample:</b> Saba Bank   |

|                                       |                            |
|---------------------------------------|----------------------------|
| <b>Cruise:</b> 64PE433                | <b>Date:</b> 4 March 2018  |
| Station: 07      Cast: 12             | Start time (UTC): 22:37    |
| <b>CTD file name*:</b> PE433 _ S07C12 | Bottom depth CTD [m]: 34   |
|                                       | Altimeter at bottom [m]: 4 |
| <b>Latitude:</b> 17° 25,238' N        | CTD operator: Alice        |
| <b>Longitude:</b> 63° 33,727' W       | <b>Sample:</b> Saba Bank   |

| NISKIN bottle | Sampling depth [m] | NUTS | TP | DIC | Alkalinity | TOC TN | POM | Flow cytometry | Micro zooplankton | Metabolomics Metagenomics | Remarks |
|---------------|--------------------|------|----|-----|------------|--------|-----|----------------|-------------------|---------------------------|---------|
| 1             | 30                 | X    | X  | X   | X          |        |     |                |                   |                           |         |
| 2             | 30                 |      |    |     |            | X      | X   | X              |                   |                           |         |
| 3             | 25                 | X    | X  | X   | X          |        |     |                |                   |                           |         |
| 4             | 25                 |      |    |     |            |        | X   | X              |                   |                           |         |
| 5             | 15                 | X    | X  | X   | X          |        |     |                |                   |                           |         |
| 6             | 15                 |      |    |     |            |        |     |                |                   |                           |         |
| 7             | 15                 |      |    |     |            |        |     |                |                   |                           |         |
| 8             | 4                  | X    | X  | X   | X          |        |     |                |                   |                           |         |
| 9             | 4                  |      |    |     |            | X      | X   | X              |                   |                           |         |

|                                       |                             |
|---------------------------------------|-----------------------------|
| <b>Cruise:</b> 64PE433                | <b>Date:</b> 5 March 2018   |
| Station: 07      Cast: 14             | Start time (UTC): 10:25     |
| <b>CTD file name*:</b> PE433 _ S07C14 | Bottom depth CTD [m]: 34    |
|                                       | Altimeter at bottom [m]: 6? |
| <b>Latitude:</b> 17° 25,247' N        | CTD operator: Alice         |
| <b>Longitude:</b> 63° 33,734' W       | <b>Sample:</b> Saba Bank    |

| NISKIN bottle | Sampling depth [m] | NUTS | TP | DIC | Alkalinity | TOC TN | POM | Flow cytometry | Micro zooplankton | Metabolomics Metagenomics | Remarks |
|---------------|--------------------|------|----|-----|------------|--------|-----|----------------|-------------------|---------------------------|---------|
| 1             | 28                 | X    | X  | X   | X          |        |     |                |                   |                           |         |
| 2             | 28                 |      |    |     |            | X      | X   | X              |                   |                           |         |
| 3             | 22                 | X    | X  | X   | X          |        |     |                |                   |                           |         |
| 4             | 22                 |      |    |     |            |        | X   | X              |                   |                           |         |
| 5             | 12                 | X    | X  | X   | X          |        |     |                |                   |                           |         |
| 6             | 12                 |      |    |     |            |        |     |                |                   |                           |         |
| 7             | 12                 |      |    |     |            |        |     |                |                   |                           |         |
| 8             | 3                  | X    | X  | X   | X          |        |     |                |                   |                           |         |
| 9             | 3                  |      |    |     |            | X      | X   | X              |                   | X                         |         |

|                                       |                             |
|---------------------------------------|-----------------------------|
| <b>Cruise:</b> 64PE433                | <b>Date:</b> 5 March 2018   |
| Station: 07      Cast: 17             | Start time (UTC): 15:55     |
| <b>CTD file name*:</b> PE433 _ S07C17 | Bottom depth CTD [m]: 34    |
|                                       | Altimeter at bottom [m]: 5? |
| <b>Latitude:</b> 17° 25' N            | CTD operator: Laurent       |
| <b>Longitude:</b> 63° 33' W           | <b>Sample:</b> Saba Bank    |

| NISKIN bottle | Sampling depth [m] | NUTS | TP | DIC | Alkalinity | TOC TN | POM | Flow cytometry | Micro zooplankton | Metabolomics Metagenomics | Remarks |
|---------------|--------------------|------|----|-----|------------|--------|-----|----------------|-------------------|---------------------------|---------|
| 1             | 29                 | X    | X  | X   | X          |        |     |                |                   |                           |         |
| 2             | 29                 |      |    |     |            | X      | X   | X              |                   |                           |         |
| 3             | 26                 | X    | X  | X   | X          |        |     |                |                   |                           |         |
| 4             | 26                 |      |    |     |            |        | X   | X              |                   |                           |         |
| 5             | 15                 | X    | X  | X   | X          |        |     |                |                   |                           |         |
| 6             | 15                 |      |    |     |            |        |     |                |                   |                           |         |
| 7             | 2                  | X    | X  | X   | X          |        |     |                |                   |                           |         |
| 8             | 2                  |      |    |     |            | X      | X   | X              |                   | X                         |         |

|                                       |                           |
|---------------------------------------|---------------------------|
| <b>Cruise:</b> 64PE433                | <b>Date:</b> 5 March 2018 |
| Station: 08      Cast: 01             | Start time (UTC): 13:00   |
| <b>CTD file name*:</b> PE433 _ S08C01 | Bottom depth CTD [m]: 225 |
|                                       | Altimeter at bottom [m]:  |
| <b>Latitude:</b> 17° 30,12' N         | CTD operator: Laurent     |
| <b>Longitude:</b> 63° 38,58' W        | <b>Sample:</b> Saba Bank  |

| NISKIN bottle | Sampling depth [m] | NUTS | TP | DIC | Alkalinity | TOC TN | POM | Flow cytometry | Micro zooplankton | Metabolomics Metagenomics | Remarks |
|---------------|--------------------|------|----|-----|------------|--------|-----|----------------|-------------------|---------------------------|---------|
| 1             | 205                | X    | X  | X   | X          |        |     |                |                   |                           |         |
| 2             | 205                | X    |    |     |            |        |     | X              |                   |                           |         |
| 3             | 130                | X    |    |     |            |        |     | X              |                   |                           |         |
| 4             | 80                 |      |    |     |            |        | X   |                |                   |                           |         |
| 5             | 80                 | X    |    |     |            |        |     | X              |                   |                           |         |
| 6             | 71                 | X    |    |     |            |        |     | X              |                   |                           |         |
| 7             | 71                 | X    |    |     |            |        |     | X              |                   |                           |         |
| 8             | 40                 | X    | X  | X   | X          |        |     |                |                   |                           |         |
| 9             | 15                 | X    |    |     |            |        | X   |                |                   |                           |         |
| 10            | 15                 | X    | X  | X   | X          |        |     | X              |                   |                           |         |
| 11            | 15                 |      |    |     |            |        | X   | X              |                   |                           |         |
| 12            | 3                  | X    | X  | X   | X          |        |     |                |                   |                           |         |
| 13            | 3                  | X    |    |     |            | X      | X   | X              |                   |                           |         |

Remark: NICO student station and others

|                                       |                           |
|---------------------------------------|---------------------------|
| <b>Cruise:</b> 64PE433                | <b>Date:</b> 5 March 2018 |
| Station: 09      Cast: 02             | Start time (UTC): 21:15   |
| <b>CTD file name*:</b> PE433 _ S09C02 | Bottom depth CTD [m]: 27  |
|                                       | Altimeter at bottom [m]:  |
| <b>Latitude:</b> 17° 15,864' N        | CTD operator: Bob         |
| <b>Longitude:</b> 63° 32,401' W       | <b>Sample:</b> Saba Bank  |

| NISKIN bottle | Sampling depth [m] | NUTS | TP | DIC | Alkalinity | TOC TN | POM | Flow cytometry | Micro zooplankton | Metabolomics Metagenomics | Remarks |
|---------------|--------------------|------|----|-----|------------|--------|-----|----------------|-------------------|---------------------------|---------|
| 1             | 24                 | X    | X  | X   | X          |        |     |                |                   |                           |         |
| 2             | 24                 |      |    |     |            | X      | X   | X              |                   |                           |         |
| 3             | 15                 | X    | X  | X   | X          |        |     |                |                   |                           |         |
| 4             | 15                 |      |    |     |            |        | X   | X              |                   |                           |         |
| 5             | 4                  | X    | X  | X   | X          |        |     |                |                   |                           |         |
| 6             | 4                  |      |    |     |            | X      | X   | X              |                   |                           |         |

|                                       |                             |
|---------------------------------------|-----------------------------|
| <b>Cruise:</b> 64PE433                | <b>Date:</b> 6 March 2018   |
| Station: 09      Cast: 04             | Start time (UTC): 10:25     |
| <b>CTD file name*:</b> PE433 _ S09C04 | Bottom depth CTD [m]: 26    |
|                                       | Altimeter at bottom [m]: 47 |
| Latitude: 17° ????' N                 | CTD operator: Didier        |
| <b>Longitude:</b> 63° 32,369' W       | <b>Sample:</b> Saba Bank    |

| NISKIN bottle | Sampling depth [m] | NUTS | TP | DIC | Alkalinity | TOC TN | POM | Flow cytometry | Micro zooplankton | Metabolomics Metagenomics | Remarks |
|---------------|--------------------|------|----|-----|------------|--------|-----|----------------|-------------------|---------------------------|---------|
| 1             | 22                 | X    | X  | X   | X          |        |     |                |                   |                           |         |
| 2             | 22                 |      |    |     |            | X      | X   | X              |                   |                           |         |
| 3             | 15                 | X    | X  | X   | X          |        |     |                |                   |                           |         |
| 4             | 15                 |      |    |     |            |        | X   | X              |                   |                           |         |
| 5             | 3                  | X    | X  | X   | X          |        |     |                |                   |                           |         |
| 6             | 3                  |      |    |     |            | X      | X   | X              |                   | X                         |         |

|                                       |                            |
|---------------------------------------|----------------------------|
| <b>Cruise:</b> 64PE433                | <b>Date:</b> 6 March 2018  |
| Station: 09      Cast: 05             | Start time (UTC): 12:02    |
| <b>CTD file name*:</b> PE433 _ S09C05 | Bottom depth CTD [m]: 20   |
|                                       | Altimeter at bottom [m]: 3 |
| <b>Latitude:</b> 17° 15,972' N        | CTD operator: Emil         |
| <b>Longitude:</b> 63° 32,428' W       | <b>Sample:</b> Saba Bank   |

|                                       |                            |
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| <b>Cruise:</b> 64PE433                | <b>Date:</b> 6 March 2018  |
| Station: 09      Cast: 06             | Start time (UTC): 12:20    |
| <b>CTD file name*:</b> PE433 _ S09C06 | Bottom depth CTD [m]: 25   |
|                                       | Altimeter at bottom [m]: 3 |
| <b>Latitude:</b> 17° 15,857' N        | CTD operator: Emil         |
| <b>Longitude:</b> 63° 32,318' W       | <b>Sample:</b> Saba Bank   |

|                                       |                              |
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| <b>Cruise:</b> 64PE433                | <b>Date:</b> 6 March 2018    |
| Station: 09      Cast: 07             | Start time (UTC): 12:24      |
| <b>CTD file name*:</b> PE433 _ S09C07 | Bottom depth CTD [m]: ?      |
|                                       | Altimeter at bottom [m]: 4-5 |
| <b>Latitude:</b> 17° 15,752' N        | CTD operator: Emil           |
| <b>Longitude:</b> 63° 32,429' W       | <b>Sample:</b> Saba Bank     |

|                                       |                            |
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| <b>Cruise:</b> 64PE433                | <b>Date:</b> 6 March 2018  |
| Station: 09      Cast: 08             | Start time (UTC): 12:47    |
| <b>CTD file name*:</b> PE433 _ S09C08 | Bottom depth CTD [m]: 26   |
|                                       | Altimeter at bottom [m]: 3 |
| <b>Latitude:</b> 17° 15,869' N        | CTD operator: Emil         |
| <b>Longitude:</b> 63° 32,556' W       | <b>Sample:</b> Saba Bank   |

|                                 |                           |
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| <b>Cruise:</b> 64PE433          | <b>Date:</b> 6 March 2018 |
| Station: 09      Cast: 10       | Start time (UTC): 16:10   |
| CTD file name*: PE433           | Bottom depth CTD [m]: 18  |
|                                 | Altimeter at bottom [m]:  |
| <b>Latitude:</b> 17° 15,950' N  | CTD operator: Alice       |
| <b>Longitude:</b> 63° 32,437' W | <b>Sample:</b> Saba Bank  |

| NISKIN bottle | Sampling depth [m] | NUTS | TP | DIC | Alkalinity | TOC TN | POM | Flow cytometry | Micro zooplankton | Metabolomics Metagenomics | Remarks |
|---------------|--------------------|------|----|-----|------------|--------|-----|----------------|-------------------|---------------------------|---------|
| 1             | 15                 |      |    |     |            |        |     |                |                   |                           |         |
| 2             | 15                 |      |    |     |            |        |     |                |                   |                           |         |
| 3             | 3                  |      |    |     |            |        |     |                |                   |                           |         |
| 4             | 3                  |      |    |     |            |        |     |                |                   |                           |         |

Remark: wrong site, no water sampled. No CTD file logged (overwritten by 09-11)

|                                 |                           |
|---------------------------------|---------------------------|
| <b>Cruise:</b> 64PE433          | <b>Date:</b> 6 March 2018 |
| Station: 09      Cast: 11       | Start time (UTC): 17:10   |
| CTD file name*: PE433 S09C11    | Bottom depth CTD [m]: 27  |
|                                 | Altimeter at bottom [m]:  |
| <b>Latitude:</b> 17° 15,852' N  | CTD operator: Alice       |
| <b>Longitude:</b> 63° 32,387' W | <b>Sample:</b> Saba Bank  |

| NISKIN bottle | Sampling depth [m] | NUTS | TP | DIC | Alkalinity | TOC TN | POM | Flow cytometry | Micro zooplankton | Metabolomics Metagenomics | Remarks |
|---------------|--------------------|------|----|-----|------------|--------|-----|----------------|-------------------|---------------------------|---------|
| 1             | 24                 | X    | X  | X   | X          |        |     |                |                   |                           |         |
| 2             | 24                 |      |    |     |            | X      | X   | X              | X                 |                           |         |
| 3             | 14                 | X    | X  | X   | X          |        |     |                |                   |                           |         |
| 4             | 14                 |      |    |     |            |        | X   | X              |                   |                           |         |
| 5             | 3                  | X    | X  | X   | X          |        |     |                |                   |                           |         |
| 6             | 3                  |      |    |     |            | X      | X   | X              | X                 | X                         |         |
| 7             | 3                  |      |    |     |            |        |     |                |                   |                           |         |

|                                       |                              |
|---------------------------------------|------------------------------|
| <b>Cruise:</b> 64PE433                | <b>Date:</b> 6 March 2018    |
| Station: 10      Cast: 03             | Start time (UTC): 21:11      |
| <b>CTD file name*:</b> PE433 _ S10C03 | Bottom depth CTD [m]: 30     |
|                                       | Altimeter at bottom [m]: 3?? |
| <b>Latitude:</b> 17° 15,691' N        | CTD operator: Didier         |
| <b>Longitude:</b> 63° 34,406' W       | <b>Sample:</b> Saba Bank     |

| NISKIN bottle | Sampling depth [m] | NUTS | TP | DIC | Alkalinity | TOC TN | POM | Flow cytometry | Micro zooplankton | Metabolomics Metagenomics | Remarks |
|---------------|--------------------|------|----|-----|------------|--------|-----|----------------|-------------------|---------------------------|---------|
| 1             | 27                 | X    | X  | X   | X          |        |     |                |                   |                           |         |
| 2             | 27                 |      |    |     |            | X      | X   | X              |                   |                           |         |
| 3             | 20                 | X    | X  | X   | X          |        |     |                |                   |                           |         |
| 4             | 20                 |      |    |     |            |        | X   | X              |                   |                           |         |
| 5             | 3                  | X    | X  | X   | X          |        |     |                |                   |                           |         |
| 6             | 3                  |      |    |     |            | X      | X   | X              |                   |                           |         |

|                                       |                           |
|---------------------------------------|---------------------------|
| <b>Cruise:</b> 64PE433                | <b>Date:</b> 7 March 2018 |
| Station: 10      Cast: 05             | Start time (UTC): 10:30   |
| <b>CTD file name*:</b> PE433 _ S10C05 | Bottom depth CTD [m]: 32  |
|                                       | Altimeter at bottom [m]:  |
| <b>Latitude:</b> 17° 15,658' N        | CTD operator: Laurent     |
| <b>Longitude:</b> 63° 34,428' W       | <b>Sample:</b> Saba Bank  |

| NISKIN bottle | Sampling depth [m] | NUTS | TP | DIC | Alkalinity | TOC TN | POM | Flow cytometry | Micro zooplankton | Metabolomics Metagenomics | Remarks |
|---------------|--------------------|------|----|-----|------------|--------|-----|----------------|-------------------|---------------------------|---------|
| 1             | 28                 | X    | X  | X   | X          |        |     |                |                   |                           |         |
| 2             | 28                 |      |    |     |            | X      | X   | X              |                   |                           |         |
| 3             | 22                 | X    | X  | X   | X          |        |     |                |                   |                           |         |
| 4             | 22                 |      |    |     |            |        | X   | X              |                   |                           |         |
| 5             | 15                 | X    | X  | X   | X          |        |     |                |                   |                           |         |
| 6             | 15                 |      |    |     |            | X      | X   | X              |                   |                           |         |
| 7             | 3                  | X    | X  | X   | X          |        |     |                |                   |                           |         |
| 8             | 3                  |      |    |     |            | X      | X   | X              |                   | X                         |         |

|                                       |                            |
|---------------------------------------|----------------------------|
| <b>Cruise:</b> 64PE433                | <b>Date:</b> 7 March 2018  |
| Station: 10      Cast: 06             | Start time (UTC): 12:12    |
| <b>CTD file name*:</b> PE433 _ S10C06 | Bottom depth CTD [m]: 27   |
|                                       | Altimeter at bottom [m]: 2 |
| <b>Latitude:</b> 17° 15,821' N        | CTD operator: Emil         |
| <b>Longitude:</b> 63° 34,440' W       | <b>Sample:</b> Saba Bank   |

Remark: Casino not operational during cast. Works again around 12:20 UTC

|                                       |                            |
|---------------------------------------|----------------------------|
| <b>Cruise:</b> 64PE433                | <b>Date:</b> 7 March 2018  |
| Station: 10      Cast: 07             | Start time (UTC): 12:26    |
| <b>CTD file name*:</b> PE433 _ S10C07 | Bottom depth CTD [m]: 32   |
|                                       | Altimeter at bottom [m]: 5 |
| <b>Latitude:</b> 17° 15,714' N        | CTD operator: Emil         |
| <b>Longitude:</b> 63° 34,328' W       | <b>Sample:</b> Saba Bank   |

|                                       |                            |
|---------------------------------------|----------------------------|
| <b>Cruise:</b> 64PE433                | <b>Date:</b> 7 March 2018  |
| Station: 10      Cast: 08             | Start time (UTC): 12:42    |
| <b>CTD file name*:</b> PE433 _ S10C08 | Bottom depth CTD [m]: 49   |
|                                       | Altimeter at bottom [m]: 4 |
| <b>Latitude:</b> 17° 15,611' N        | CTD operator: Emil         |
| <b>Longitude:</b> 63° 34,435' W       | <b>Sample:</b> Saba Bank   |

|                                       |                            |
|---------------------------------------|----------------------------|
| <b>Cruise:</b> 64PE433                | <b>Date:</b> 7 March 2018  |
| Station: 10      Cast: 09             | Start time (UTC): 12:59    |
| <b>CTD file name*:</b> PE433 _ S10C09 | Bottom depth CTD [m]: 28   |
|                                       | Altimeter at bottom [m]: 3 |
| <b>Latitude:</b> 17° 15,718' N        | CTD operator: Emil         |
| <b>Longitude:</b> 63° 34,567' W       | <b>Sample:</b> Saba Bank   |

|                                       |                             |
|---------------------------------------|-----------------------------|
| <b>Cruise:</b> 64PE433                | <b>Date:</b> 7 March 2018   |
| Station: 10      Cast: 11             | Start time (UTC): 15:45     |
| <b>CTD file name*:</b> PE433 _ S10C11 | Bottom depth CTD [m]: 28    |
|                                       | Altimeter at bottom [m]: 3? |
| <b>Latitude:</b> 17° 15,761' N        | CTD operator: Alice         |
| <b>Longitude:</b> 63° 34,535' W       | <b>Sample:</b> Saba Bank    |

| NISKIN bottle | Sampling depth [m] | NUTS | TP | DIC | Alkalinity | TOC TN | POM | Flow cytometry | Micro zooplankton | Metabolomics Metagenomics | Remarks     |
|---------------|--------------------|------|----|-----|------------|--------|-----|----------------|-------------------|---------------------------|-------------|
| 1             | 25                 | X    | X  | X   | X          |        |     |                |                   |                           |             |
| 2             | 25                 |      |    |     |            | X      | X   | X              | X                 |                           |             |
| 3             | 15                 | X    | X  | X   | X          |        |     |                |                   |                           |             |
| 4             | 15                 |      |    |     |            |        | X   |                |                   |                           |             |
| 5             | 15                 |      |    |     |            |        |     |                |                   |                           | NICO-niskin |
| 6             | 15                 |      |    |     |            |        |     |                |                   |                           | NICO-niskin |
| 5             | 15                 |      |    |     |            |        |     |                |                   |                           | NICO-niskin |
| 6             | 3                  | X    | X  | X   | X          |        |     |                |                   |                           |             |
| 7             | 3                  |      |    |     |            | X      | X   | X              | X                 | X                         |             |
| 8             | 3                  |      |    |     |            |        |     |                |                   |                           | NICO-niskin |

|                                       |                           |
|---------------------------------------|---------------------------|
| <b>Cruise:</b> 64PE433                | <b>Date:</b> 7 March 2018 |
| Station: 10      Cast: 13             | Start time (UTC): 18:50   |
| <b>CTD file name*:</b> PE433 _ S10C13 | Bottom depth CTD [m]: 31  |
|                                       | Altimeter at bottom [m]:  |
| <b>Latitude:</b> 17° 15,695' N        | CTD operator: Alice       |
| <b>Longitude:</b> 63° 34,380' W       | <b>Sample:</b> Saba Bank  |

| NISKIN bottle | Sampling depth [m] | NUTS | TP | DIC | Alkalinity | TOC TN | POM | Flow cytometry | Micro zooplankton | Metabolomics Metagenomics | Remarks |
|---------------|--------------------|------|----|-----|------------|--------|-----|----------------|-------------------|---------------------------|---------|
| 1             | 28                 | X    | X  | X   | X          |        |     |                |                   |                           |         |
| 2             | 28                 |      |    |     |            | X      | X   | X              |                   |                           |         |
| 3             | 15                 | X    | X  | X   | X          |        |     |                |                   |                           |         |
| 4             | 15                 |      |    |     |            |        | X   | X              |                   |                           |         |
| 5             | 3                  | X    | X  | X   | X          |        |     |                |                   |                           |         |
| 6             | 3                  |      |    |     |            | X      | X   | X              |                   | X                         |         |

|                                       |                              |
|---------------------------------------|------------------------------|
| <b>Cruise:</b> 64PE433                | <b>Date:</b> 8 March 2018    |
| Station: 11      Cast: 03             | Start time (UTC): 10:40      |
| <b>CTD file name*:</b> PE433 _ S11C03 | Bottom depth CTD [m]: 26     |
|                                       | Altimeter at bottom [m]: 3?? |
| <b>Latitude:</b> 17° 16,355' N        | CTD operator: Alice          |
| <b>Longitude:</b> 63° 33,127' W       | <b>Sample:</b> Saba Bank     |

| NISKIN bottle | Sampling depth [m] | NUTS | TP | DIC | Alkalinity | TOC TN | POM | Flow cytometry | Micro zooplankton | Metabolomics Metagenomics | Remarks |
|---------------|--------------------|------|----|-----|------------|--------|-----|----------------|-------------------|---------------------------|---------|
| 1             | 23                 | X    | X  | X   | X          |        |     |                |                   |                           |         |
| 2             | 23                 |      |    |     |            | X      | X   | X              |                   |                           |         |
| 3             | 13                 | X    | X  | X   | X          |        |     |                |                   |                           |         |
| 4             | 13                 |      |    |     |            |        | X   | X              |                   |                           |         |
| 5             | 3                  | X    | X  | X   | X          |        |     |                |                   |                           |         |
| 6             | 3                  |      |    |     |            | X      | X   | X              |                   | X                         |         |
| 7             | 3                  |      |    |     |            |        |     |                |                   |                           |         |

|                                       |                            |
|---------------------------------------|----------------------------|
| <b>Cruise:</b> 64PE433                | <b>Date:</b> 8 March 2018  |
| Station: 11      Cast: 04             | Start time (UTC): 11:45    |
| <b>CTD file name*:</b> PE433 _ S11C04 | Bottom depth CTD [m]: 24   |
|                                       | Altimeter at bottom [m]: 2 |
| <b>Latitude:</b> 17° 16,493' N        | CTD operator: Emil         |
| <b>Longitude:</b> 63° 33,217' W       | <b>Sample:</b> Saba Bank   |

|                                       |                            |
|---------------------------------------|----------------------------|
| <b>Cruise:</b> 64PE433                | <b>Date:</b> 8 March 2018  |
| Station: 11      Cast: 05             | Start time (UTC): 12:07    |
| <b>CTD file name*:</b> PE433 _ S11C05 | Bottom depth CTD [m]: 24   |
|                                       | Altimeter at bottom [m]: 2 |
| <b>Latitude:</b> 17° 16,375' N        | CTD operator: Emil         |
| <b>Longitude:</b> 63° 33,103' W       | <b>Sample:</b> Saba Bank   |

|                                       |                              |
|---------------------------------------|------------------------------|
| <b>Cruise:</b> 64PE433                | <b>Date:</b> 8 March 2018    |
| Station: 11      Cast: 06             | Start time (UTC): 12:21      |
| <b>CTD file name*:</b> PE433 _ S11C06 | Bottom depth CTD [m]: 25     |
|                                       | Altimeter at bottom [m]: 2,5 |
| <b>Latitude:</b> 17° 16,278' N        | CTD operator: Emil           |
| <b>Longitude:</b> 63° 33,233' W       | <b>Sample:</b> Saba Bank     |

|                                       |                            |
|---------------------------------------|----------------------------|
| <b>Cruise:</b> 64PE433                | <b>Date:</b> 8 March 2018  |
| Station: 11      Cast: 07             | Start time (UTC): 12:37    |
| <b>CTD file name*:</b> PE433 _ S11C07 | Bottom depth CTD [m]: 28   |
|                                       | Altimeter at bottom [m]: 3 |
| <b>Latitude:</b> 17° 16,387' N        | CTD operator: Emil         |
| <b>Longitude:</b> 63° 33,331' W       | <b>Sample:</b> Saba Bank   |

|                                       |                              |
|---------------------------------------|------------------------------|
| <b>Cruise:</b> 64PE433                | <b>Date:</b> 8 March 2018    |
| Station: 11      Cast: 09             | Start time (UTC): 16:15      |
| <b>CTD file name*:</b> PE433 _ S11C09 | Bottom depth CTD [m]: 22     |
|                                       | Altimeter at bottom [m]: 4?? |
| <b>Latitude:</b> 17° 16,362' N        | CTD operator: Laurent        |
| <b>Longitude:</b> 63° 33,096' W       | <b>Sample:</b> Saba Bank     |

| NISKIN bottle | Sampling depth [m] | NUTS | TP | DIC | Alkalinity | TOC TN | POM | Flow cytometry | Micro zooplankton | Metabolomics Metagenomics | Remarks |
|---------------|--------------------|------|----|-----|------------|--------|-----|----------------|-------------------|---------------------------|---------|
| 1             | 18                 | X    | X  | X   | X          |        |     |                |                   |                           |         |
| 2             | 18                 |      |    |     |            | X      | X   | X              | X                 |                           |         |
| 3             | 15                 | X    | X  | X   | X          |        |     |                |                   |                           |         |
| 4             | 15                 |      |    |     |            |        | X   | X              |                   |                           |         |
| 5             | 3                  | X    | X  | X   | X          |        |     |                |                   |                           |         |
| 6             | 3                  |      |    |     |            | X      | X   | X              | X                 | X                         |         |

|                                       |  |  |  |  |  |                              |  |  |  |  |  |
|---------------------------------------|--|--|--|--|--|------------------------------|--|--|--|--|--|
| <b>Cruise:</b> 64PE433                |  |  |  |  |  | <b>Date:</b> 8 March 2018    |  |  |  |  |  |
| Station: 11      Cast: 11             |  |  |  |  |  | Start time (UTC): 21:20      |  |  |  |  |  |
| <b>CTD file name*:</b> PE433 _ S11C11 |  |  |  |  |  | Bottom depth CTD [m]: 26     |  |  |  |  |  |
|                                       |  |  |  |  |  | Altimeter at bottom [m]: 2?? |  |  |  |  |  |
| <b>Latitude:</b> 17° 16,388' N        |  |  |  |  |  | CTD operator: Alice          |  |  |  |  |  |
| <b>Longitude:</b> 63° 33,121' W       |  |  |  |  |  | <b>Sample:</b> Saba Bank     |  |  |  |  |  |

| NISKIN bottle | Sampling depth [m] | NUTS | TP | DIC | Alkalinity | TOC TN | POM | Flow cytometry | Micro zooplankton | Metabolomics Metagenomics | Remarks |
|---------------|--------------------|------|----|-----|------------|--------|-----|----------------|-------------------|---------------------------|---------|
| 1             | 24                 | X    | X  | X   | X          |        |     |                |                   |                           |         |
| 2             | 24                 |      |    |     |            | X      | X   | X              |                   |                           |         |
| 3             | 19                 | X    | X  | X   | X          |        |     |                |                   |                           |         |
| 4             | 19                 |      |    |     |            |        | X   | X              |                   |                           |         |
| 5             | 3                  | X    | X  | X   | X          |        |     |                |                   |                           |         |
| 6             | 3                  |      |    |     |            | X      | X   | X              |                   |                           |         |
| 7             | 3                  |      |    |     |            |        |     |                |                   |                           |         |

|                                       |  |  |  |  |  |                              |  |  |  |  |  |
|---------------------------------------|--|--|--|--|--|------------------------------|--|--|--|--|--|
| <b>Cruise:</b> 64PE433                |  |  |  |  |  | <b>Date:</b> 9 March 2018    |  |  |  |  |  |
| Station: 11      Cast: 13             |  |  |  |  |  | Start time (UTC): 10:27      |  |  |  |  |  |
| <b>CTD file name*:</b> PE433 _ S11C13 |  |  |  |  |  | Bottom depth CTD [m]: 26     |  |  |  |  |  |
|                                       |  |  |  |  |  | Altimeter at bottom [m]: 2?? |  |  |  |  |  |
| <b>Latitude:</b> 17° 16,351' N        |  |  |  |  |  | CTD operator: Didier         |  |  |  |  |  |
| <b>Longitude:</b> 63° 33,13' W        |  |  |  |  |  | <b>Sample:</b> Saba Bank     |  |  |  |  |  |

| NISKIN bottle | Sampling depth [m] | NUTS | TP | DIC | Alkalinity | TOC TN | POM | Flow cytometry | Micro zooplankton | Metabolomics Metagenomics | Remarks |
|---------------|--------------------|------|----|-----|------------|--------|-----|----------------|-------------------|---------------------------|---------|
| 1             | 24                 | X    | X  | X   | X          |        |     |                |                   |                           |         |
| 2             | 24                 |      |    |     |            | X      | X   | X              |                   |                           |         |
| 3             | 20                 | X    | X  | X   | X          |        |     |                |                   |                           |         |
| 4             | 20                 |      |    |     |            |        | X   | X              |                   |                           |         |
| 5             | 3                  | X    | X  | X   | X          |        |     |                |                   |                           |         |
| 6             | 3                  |      |    |     |            | X      | X   | X              |                   |                           |         |
| 7             | 3                  |      |    |     |            |        |     |                |                   |                           |         |

|                                       |  |  |  |  |  |                              |  |  |  |  |  |
|---------------------------------------|--|--|--|--|--|------------------------------|--|--|--|--|--|
| <b>Cruise:</b> 64PE433                |  |  |  |  |  | <b>Date:</b> 9 March 2018    |  |  |  |  |  |
| Station: 14      Cast: 01             |  |  |  |  |  | Start time (UTC): 17:20      |  |  |  |  |  |
| <b>CTD file name*:</b> PE433 _ S14C01 |  |  |  |  |  | Bottom depth CTD [m]: 200    |  |  |  |  |  |
|                                       |  |  |  |  |  | Altimeter at bottom [m]: 2?? |  |  |  |  |  |
| <b>Latitude:</b> 17° 16,319' N        |  |  |  |  |  | CTD operator: Laurent        |  |  |  |  |  |
| <b>Longitude:</b> 63° 18,272' W       |  |  |  |  |  | <b>Sample:</b> Saba Bank     |  |  |  |  |  |

| NISKIN bottle | Sampling depth [m] | NUTS | TP | DIC | Alkalinity | TOC TN | POM | Flow cytometry | Micro zooplankton | Metabolomics Metagenomics | Remarks |
|---------------|--------------------|------|----|-----|------------|--------|-----|----------------|-------------------|---------------------------|---------|
| 1             | 198                | X    | X  | X   | X          |        |     |                |                   |                           |         |
| 2             | 198                |      |    |     |            |        |     |                |                   |                           |         |
| 3             | 94                 |      |    |     |            |        |     |                |                   |                           |         |
| 4             | 94                 |      |    |     |            |        |     |                |                   |                           |         |
| 5             | 85                 | X    | X  | X   | X          |        |     |                |                   |                           |         |
| 6             | 85                 |      |    |     |            | X      | X   | X              |                   |                           |         |
| 7             | 40                 | X    | X  | X   | X          |        |     |                |                   |                           |         |
| 8             | 40                 |      |    |     |            |        |     |                |                   |                           |         |
| 9             | 15                 | X    | X  | X   | X          |        | X   | X              |                   |                           |         |
| 10            | 15                 |      |    |     |            |        |     |                |                   |                           |         |
| 11            | 4                  | X    | X  | X   | X          | X      | X   | X              |                   |                           |         |
| 12            | 4                  |      |    |     |            |        |     |                |                   |                           |         |

|                                       |  |  |  |  |  |                              |  |  |  |  |  |
|---------------------------------------|--|--|--|--|--|------------------------------|--|--|--|--|--|
| <b>Cruise:</b> 64PE433                |  |  |  |  |  | <b>Date:</b> 10 March 2018   |  |  |  |  |  |
| Station: 15      Cast: 01             |  |  |  |  |  | Start time (UTC): 11:10      |  |  |  |  |  |
| <b>CTD file name*:</b> PE433 _ S15C01 |  |  |  |  |  | Bottom depth CTD [m]: 203    |  |  |  |  |  |
|                                       |  |  |  |  |  | Altimeter at bottom [m]: 2?? |  |  |  |  |  |
| <b>Latitude:</b> 17° 28,525' N        |  |  |  |  |  | CTD operator: Laurent        |  |  |  |  |  |
| <b>Longitude:</b> 63° 28,526' W       |  |  |  |  |  | <b>Sample:</b> Saba Bank     |  |  |  |  |  |

| NISKIN bottle | Sampling depth [m] | NUTS | TP | DIC | Alkalinity | TOC TN | POM | Flow cytometry | Micro zooplankton | Metabolomics Metagenomics | Remarks |
|---------------|--------------------|------|----|-----|------------|--------|-----|----------------|-------------------|---------------------------|---------|
| 1             | 201                | X    | X  | X   | X          |        |     |                |                   |                           |         |
| 2             | 201                |      |    |     |            |        |     |                |                   |                           |         |
| 3             | 85                 | X    | X  | X   | X          |        |     |                |                   |                           |         |
| 4             | 85                 |      |    |     |            | X      | X   | X              |                   |                           |         |
| 5             | 40                 | X    | X  | X   | X          |        |     |                |                   |                           |         |
| 6             | 40                 |      |    |     |            |        | X   | X              |                   |                           |         |
| 7             | 3                  | X    | X  | X   | X          |        |     |                |                   |                           |         |
| 8             | 3                  |      |    |     |            | X      | X   | X              |                   |                           |         |

## 5.4 Alkalinity samples processed during the cruise

| Timestamp (UTC)  | Sample ID | Stn_Cst_depth_date              | TA |
|------------------|-----------|---------------------------------|----|
| 28/02/2018 18:20 | 1010      | S4_C3_23m_2802                  | x  |
| 28/02/2018 18:31 | 1025      | S4_C3_23m_Rep_2802              | x  |
| 28/02/2018 18:45 | 1028      | S4_C3_16m_2802                  | x  |
| 28/02/2018 18:56 | 1017      | S4_C3_12m_2802                  | x  |
| 28/02/2018 19:09 | 1020      | S4_C3_3m_2803                   | x  |
| 28/02/2018 19:22 | 1021      | CRM1_2802                       | x  |
| 28/02/2018 19:33 | 1022      | CRM2_2802                       | x  |
| 28/02/2018 19:53 | 1026      | S4_C2_PB2_2802                  | x  |
| 28/02/2018 20:09 | 1024      | S4_C2_PB2_2802                  | x  |
| 28/02/2018 20:25 | 1023      | S4_C2_PB1_2802                  | x  |
| 28/02/2018 20:43 | 38        | S4_C2_PB3_2802                  | x  |
| 28/02/2018 20:58 | 112       | S4_C2_PB4_2802                  | x  |
| 28/02/2018 21:13 | 39        | S4_C2_PB5_2802                  | x  |
| 28/02/2018 22:40 | 1014      | S4_C12_26m_2802                 | x  |
| 28/02/2018 22:51 | 1018      | S4_C12_26m_Rep_2802             | x  |
| 28/02/2018 23:02 | 1024      | S4_C12_3m_2802                  | x  |
| 28/02/2018 23:13 | 1026      | S4_C12_20m_2802                 | x  |
| 28/02/2018 23:29 | 1027      | S4_C12_12m_2803                 | x  |
| 28/02/2018 23:43 | 1021      | S4_C11_PB2_2802                 | x  |
| 28/02/2018 23:55 | 1019      | S4_C11_PB2_2802                 | x  |
| 01/03/2018 00:08 | 1020      | S4_C11_PB1_2802                 | x  |
| 01/03/2018 00:21 | 1017      | S4_C11_PB3_2802                 | x  |
| 01/03/2018 00:33 | 1004      | S4_C11_PB4_2802                 | x  |
| 01/03/2018 00:47 | 39        | S4_C11_PB5_2802                 | x  |
| 01/03/2018 00:59 | 37        | S4_C11_PB6_2802                 | x  |
| 01/03/2018 10:57 | 1022      | test1_0103                      | x  |
| 01/03/2018 11:08 | 1024      | test2_0103                      | x  |
| 01/03/2018 11:21 | 38        | S4_C14_28m_0103                 | x  |
| 01/03/2018 11:35 | 1020      | S4_C14_22m_0103                 | x  |
| 01/03/2018 11:39 | 1020      | S4_C14_22m_01038min             | x  |
| 01/03/2018 11:52 | 1021      | S4_C14_28m_0103                 | x  |
| 01/03/2018 12:19 | 1022      | S4_C14_12m_0103                 | x  |
| 01/03/2018 12:33 | 1025      | S4_C14_3m_0103                  | x  |
| 01/03/2018 12:06 | 1024      | S4_C15_199m_0301                | x  |
| 01/03/2018 12:52 | 1014      | S4_C15_40m_0103                 | x  |
| 01/03/2018 13:08 | 1027      | S4_C15_28m_0103(discard)        | x  |
| 01/03/2018 13:29 | 1023      | S4_C15_15m_0103                 | x  |
| 01/03/2018 13:46 | 1018      | S4_C15_3m_0103                  | x  |
| 01/03/2018 13:59 | 1014      | S4_C13_PB5_0103                 | x  |
| 01/03/2018 14:11 | 1024      | S4_C13_PB2_0103                 | x  |
| 01/03/2018 14:23 | 1011      | S4_C13_PB4_0103                 | x  |
| 01/03/2018 14:35 | 1017      | S4_C13_PB1_0103                 | x  |
| 01/03/2018 14:49 | 1010      | S4_C13_PB6_0103                 | x  |
| 01/03/2018 15:03 | 1026      | S4_C13_PB2_rep_0103             | x  |
| 01/03/2018 15:17 | 1021      | S4_C13_PB3_0103                 | x  |
| 01/03/2018 17:36 | 1022      | test_dummy                      | x  |
| 01/03/2018 17:52 | 1014      | S4_C19_22m_0103                 | x  |
| 01/03/2018 18:23 | 1021      | S4_C19_3m_0103_ref not recorded | x  |
| 01/03/2018 18:06 | 1019      | S4_C19_15m_0103                 | x  |
| 01/03/2018 18:39 | 1017      | S4_C19_22m_0103_rep             | x  |
| 01/03/2018 18:56 | 1020      | test_dummy                      | x  |
| 01/03/2018 19:09 | 1019      | S4_C18_PB2_0103                 | x  |
| 01/03/2018 19:21 | 1027      | S4_C18_PB5_0103                 | x  |
| 01/03/2018 19:32 | 1014      | S4_C18_PB1_0103                 | x  |
| 01/03/2018 19:43 | 1022      | S4_C18_PB6_0103                 | x  |
| 01/03/2018 19:57 | 1021      | S4_C18_PB3_0103                 | x  |
| 01/03/2018 20:08 | 1023      | S4_C18_PB2_rep_0103             | x  |
| 01/03/2018 20:23 | 1028      | CRM154                          | x  |
| 01/03/2018 21:59 | 1022      | S5_C3_12m_0103                  | x  |
| 01/03/2018 22:49 | 1027      | S5_C3_12m_0103                  | x  |
| 01/03/2018 23:02 | 1026      | S5_C3_3m_0103                   | x  |
| 01/03/2018 23:13 | 1025      | S5_C3_3m_0103                   | x  |
| 01/03/2018 23:28 | 1028      | S5_C2_PB1_0103                  | x  |

| <i>Timestamp (UTC)</i> | Sample ID | Stn_Cst_depth_date         | TA |
|------------------------|-----------|----------------------------|----|
| 01/03/2018 23:40       | 1027      | CRM154                     | x  |
| 01/03/2018 23:55       | 1026      | S5_C2_PB2_0103             | x  |
| 02/03/2018 00:09       | 1011      | S5_C2_PB3_0103             | x  |
| 02/03/2018 00:24       | 1017      | S5_C2_PB5_0103             | x  |
| 02/03/2018 00:38       | 1023      | S5_C2_PB6_0103             | x  |
| 02/03/2018 00:49       | 1024      | S5_C2_PB2_rep_0103         | x  |
| 02/03/2018 01:03       | 1010      | S5_C2_PB4_0103             | x  |
| 02/03/2018 11:01       | 1017      | S5_C9_15m_0203             | x  |
| 02/03/2018 11:16       | 1014      | S5_C9_15m_0203_rep1        | x  |
| 02/03/2018 11:26       | 1024      | S5_C9_3m_0203              | x  |
| 02/03/2018 11:37       | 1018      | S5_C9_15m_0203             | x  |
| 02/03/2018 11:49       | 1026      | S5_C9_3m_0203_rep1         | x  |
| 02/03/2018 12:05       | 1027      | S5_C8_PB1_0203             | x  |
| 02/03/2018 12:21       | 1014      | S5_C8_PB1_0203_rep         | x  |
| 02/03/2018 12:35       | 1024      | S5_C8_PB2_0203             | x  |
| 02/03/2018 12:49       | 1023      | S5_C8_PB3_0203             | x  |
| 02/03/2018 13:05       | 1018      | S5_C8_PB4_0203             | x  |
| 02/03/2018 13:22       | 1027      | S5_C8_PB5_0203             | x  |
| 02/03/2018 13:34       | 1017      | S5_C8_PB6_0203             | x  |
| 02/03/2018 13:50       | 1025      | CRM154                     | x  |
| 02/03/2018 14:04       | 1022      | CRM154                     | x  |
| 02/03/2018 17:43       | 1027      | S5_C11_13m_0203            | x  |
| 02/03/2018 17:54       | 1025      | S5_C11_13m_0203_rep        | x  |
| 02/03/2018 18:05       | 1022      | S5_C11_3m_0203             | x  |
| 02/03/2018 18:14       | 1018      | S5_C11_3m_0203_rep         | x  |
| 02/03/2018 18:26       | 1024      | S5_C10_PB1_0203            | x  |
| 02/03/2018 18:36       | 1026      | S5_C10_PB2_0203            | x  |
| 02/03/2018 18:46       | 1017      | S5_C10_PB2_0203_rep        | x  |
| 02/03/2018 18:56       | 1018      | S5_C10_PB3_0203            | x  |
| 02/03/2018 19:06       | 1022      | S5_C10_PB4_0203            | x  |
| 02/03/2018 19:17       | 1023      | S5_C10_PB5_0203            | x  |
| 02/03/2018 19:26       | 1026      | S5_C10_PB6_0203            | x  |
| 02/03/2018 19:40       | 1018      | CRM154                     | x  |
| 02/03/2018 22:41       | 1024      | S5_C18_3m_0203             | x  |
| 02/03/2018 22:43       | 1024      | S5_C18_3m_0203logged twice | x  |
| 02/03/2018 22:54       | 1018      | S5_C18_14m_0203            | x  |
| 02/03/2018 23:07       | 1017      | S5_C18_14m_0203            | x  |
| 02/03/2018 23:19       | 1027      | S5_C18_3m_0203             | x  |
| 02/03/2018 23:33       | 1014      | S5_C18_PB1_0203            | x  |
| 02/03/2018 23:48       | 1025      | S5_C18_PB2_0203            | x  |
| 03/03/2018 00:00       | 1024      | S5_C18_PB2_0203_rep        | x  |
| 03/03/2018 00:12       | 1023      | S5_C18_PB3_0203            | x  |
| 03/03/2018 00:26       | 1018      | S5_C18_PB4_0203            | x  |
| 03/03/2018 00:38       | 1026      | S5_C18_PB5_0203            | x  |
| 03/03/2018 00:51       | 1022      | S5_C18_PB6_0203            | x  |
| 03/03/2018 11:27       | 1014      | S6_C3_23m_0303             | x  |
| 03/03/2018 11:38       | 1027      | S6_C3_23m_0303_rep         | x  |
| 03/03/2018 11:48       | 1025      | S6_C3_23m_0303_rep2        | x  |
| 03/03/2018 11:59       | 1018      | S6_C3_18m_0303             | x  |
| 03/03/2018 12:10       | 1023      | S6_C3_3m_0303              | x  |
| 03/03/2018 12:30       | 1027      | S6_C2_PB1_0303             | x  |
| 03/03/2018 12:41       | 1024      | S6_C2_PB2_0303             | x  |
| 03/03/2018 12:54       | 1022      | S6_C2_PB3_0303             | x  |
| 03/03/2018 13:05       | 1026      | S6_C2_PB5_0303             | x  |
| 03/03/2018 13:15       | 1027      | S6_C2_PB6_0303             | x  |
| 03/03/2018 13:27       | 1017      | S6_C2_PB4_0303             | x  |
| 03/03/2018 13:42       | 1024      | S6_C2_PB3_0303_rep         | x  |
| 03/03/2018 13:55       | 1023      | CRM154                     | x  |
| 03/03/2018 17:39       | 1017      | S6_C5_22m_0303             | x  |
| 03/03/2018 17:49       | 1014      | S6_C5_22m_0303_rep         | x  |
| 03/03/2018 17:59       | 1018      | S6_C5_22m_0303_rep         | x  |
| 03/03/2018 18:08       | 1027      | S6_C5_17m_0303             | x  |
| 03/03/2018 18:21       | 1024      | S6_C5_3m_0303              | x  |
| 03/03/2018 18:24       | 1024      | repeat record of previous  | x  |

| <i>Timestamp (UTC)</i> | Sample ID | Stn_Cst_depth_date    | TA |
|------------------------|-----------|-----------------------|----|
| 03/03/2018 18:35       | 1018      | S6_C4_PB3_0303        | x  |
| 03/03/2018 18:44       | 1014      | S6_C4_PB3_0303_rep    | x  |
| 03/03/2018 18:53       | 1017      | S6_C4_PB1_0303        | x  |
| 03/03/2018 19:02       | 1025      | S6_C4_PB4_0303        | x  |
| 03/03/2018 19:22       | 1027      | S6_C4_PB6_0303        | x  |
| 03/03/2018 22:38       | 1025      | S6_C11_22m_0303       | x  |
| 03/03/2018 22:48       | 1018      | S6_C11_22m_0303_rep   | x  |
| 03/03/2018 22:58       | 1017      | S6_C11_22m_0303_rep   | x  |
| 03/03/2018 23:07       | 1014      | S6_C11_18m_0303       | x  |
| 03/03/2018 23:16       | 1024      | S6_C11_3m_0303        | x  |
| 03/03/2018 23:27       | 1025      | S6_C10_PB1_0303       | x  |
| 03/03/2018 23:40       | 1023      | S6_C10_PB2_0303       | x  |
| 03/03/2018 23:52       | 1027      | S6_C10_PB2_0303_rep   | x  |
| 04/03/2018 00:04       | 1017      | S6_C10_PB3_0303       | x  |
| 04/03/2018 00:16       | 1018      | S6_C10_PB4_0303       | x  |
| 04/03/2018 00:28       | 1014      | S6_C10_PB5_0303       | x  |
| 04/03/2018 00:40       | 1016      | S6_C10_PB6_0303       | x  |
| 04/03/2018 00:53       | 1026      | CRM154                | x  |
| 04/03/2018 10:59       | 1018      | S6_C13_21m_0403       | x  |
| 04/03/2018 11:13       | 1025      | S6_C13_21m_0403_rep1  | x  |
| 04/03/2018 11:25       | 1027      | S6_C13_21m_0403_rep2  | x  |
| 04/03/2018 11:35       | 1024      | S6_C13_17m_0403       | x  |
| 04/03/2018 11:47       | 1018      | S6_C13_5m_0403        | x  |
| 04/03/2018 11:58       | 1022      | CRM154                | x  |
| 04/03/2018 12:18       | 1027      | S6_C12_PB2_0403       | x  |
| 04/03/2018 12:30       | 1022      | S6_C12_PB2_0403_rep   | x  |
| 04/03/2018 12:40       | 1024      | S6_C12_PB5_0403       | x  |
| 04/03/2018 12:51       | 1026      | S6_C12_PB1_0403       | x  |
| 04/03/2018 13:02       | 1025      | S6_C12_PB3_0403       | x  |
| 04/03/2018 13:14       | 1018      | S6_C12_PB4_0403       | x  |
| 04/03/2018 13:23       | 1022      | S6_C12_PB6_0403       | x  |
| 04/03/2018 18:12       | 1014      | S7_C3_28m_0403        | x  |
| 04/03/2018 18:24       | 1022      | S7_C3_28m_0407_rep    | x  |
| 04/03/2018 18:34       | 1018      | S7_C3_28m_0407_rep    | x  |
| 04/03/2018 18:44       | 1027      | S7_C3_23m_0407_rep    | x  |
| 04/03/2018 18:53       | 1025      | S7_C3_15m_0407_rep    | x  |
| 04/03/2018 19:03       | 1024      | S7_C4_3m_0407_rep     | x  |
| 04/03/2018 19:15       | 1018      | S7_C1_PB1_0403        | x  |
| 04/03/2018 19:24       | 1014      | S7_C1_PB2_0403        | x  |
| 04/03/2018 19:34       | 1025      | S7_C1_PB2_0403        | x  |
| 04/03/2018 19:43       | 1022      | S7_C1_PB3_0403        | x  |
| 04/03/2018 19:53       | 1027      | S7_C1_PB4_0403        | x  |
| 04/03/2018 20:16       | 1023      | S7_C1_PB6_0403        | x  |
| 04/03/2018 20:05       | 1026      | S7_C1_PB5_0403        | x  |
| 04/03/2018 20:33       | 1022      | CRM154                | x  |
| 04/03/2018 23:08       | 1022      | S7_C12_30m_0403_test  | x  |
| 04/03/2018 23:17       | 1023      | S7_C12_30m_0403_test2 | x  |
| 04/03/2018 23:28       | 1025      | S7_C12_30m_0403       | x  |
| 04/03/2018 23:42       | 1018      | S7_C12_04m_0403       | x  |
| 05/03/2018 00:02       | 1023      | S7_C11_PB1_0403       | x  |
| 05/03/2018 00:18       | 1014      | S7_C12_25m_0403       | x  |
| 05/03/2018 00:30       | 1024      | S7_C12_15m_0403       | x  |
| 05/03/2018 00:43       | 1023      | S7_C11_PB5_0403       | x  |
| 05/03/2018 00:50       | 1023      | S7_C11_PB5_0403_rep   | x  |
| 05/03/2018 01:05       | 1022      | S7_C11_PB2_0403       | x  |
| 05/03/2018 01:17       | 1011      | S7_C11_PB2_0403_rep   | x  |
| 05/03/2018 01:29       | 1025      | S7_C11_PB3_0403       | x  |
| 05/03/2018 01:41       | 1018      | S7_C11_PB4_0404       | x  |
| 05/03/2018 01:51       | 1014      | S7_C11_PB6_0405       | x  |
| 05/03/2018 02:03       | 1027      | CRM154                | x  |
| 05/03/2018 10:58       | 1024      | S7_C14_28m_0503-test1 | x  |
| 05/03/2018 11:07       | 1025      | S7_C14_28m_0503_test2 | x  |
| 05/03/2018 11:19       | 1027      | S7_C14_28m_0503       | x  |
| 05/03/2018 11:28       | 1014      | S7_C14_22m_0503       | x  |

| <i>Timestamp (UTC)</i> | Sample ID | Stn_Cst_depth_date             | TA |
|------------------------|-----------|--------------------------------|----|
| 05/03/2018 11:38       | 1023      | S7_C14_12m_0503                | x  |
| 05/03/2018 11:48       | 1018      | S7_C14_3m_0503                 | x  |
| 05/03/2018 11:59       | 1026      | CRM154                         | x  |
| 05/03/2018 12:21       | 1023      | S7_C13_PB1_0503                | x  |
| 05/03/2018 12:31       | 1018      | S7_C13_PB5,6_0503              | x  |
| 05/03/2018 13:51       | 1014      | S8_deepCTD_205m_0503           | x  |
| 05/03/2018 14:02       | 1018      | S8_deepCTD_205m_0503           | x  |
| 05/03/2018 14:13       | 1026      | S8_deepCTD_205m_0503           | x  |
| 05/03/2018 14:24       | 1023      | S8_deepCTD_40m_0504            | x  |
| 05/03/2018 14:35       | 1025      | S8_deepCTD_40m_0504            | x  |
| 05/03/2018 14:36       | 1025      | S8_repeated record of previous | x  |
| 05/03/2018 14:48       | 1027      | S8_deepCTD_15m_0504            | x  |
| 05/03/2018 15:00       | 1024      | S8_deepCTD_3m_0504             | x  |
| 05/03/2018 15:13       | 1018      | CRM154                         | x  |
| 05/03/2018 15:25       | 1026      | CRM154                         | x  |
| 05/03/2018 15:37       | 1022      | CRM154                         | x  |
| 05/03/2018 17:39       | 1022      | S7_C17_29m_0503                | x  |
| 05/03/2018 17:52       | 1018      | S7_C17_29m_0503                | x  |
| 05/03/2018 18:07       | 1026      | S7_C17_29m_0503                | x  |
| 05/03/2018 18:21       | 1017      | S7_C17_26m_0503                | x  |
| 05/03/2018 18:34       | 1027      | S7_C17_15m_0503                | x  |
| 05/03/2018 18:47       | 1024      | S7_C17_3m_0503                 | x  |
| 05/03/2018 19:01       | 1016      | S7_C16_PB6_0503                | x  |
| 05/03/2018 19:13       | 1014      | S7_C16_PB5_0503                | x  |
| 05/03/2018 19:26       | 1018      | S7_C16_PB4_0503                | x  |
| 05/03/2018 19:40       | 1025      | S7_C16_PB3_0503                | x  |
| 05/03/2018 19:53       | 1022      | S7_C16_PB3_0503                | x  |
| 05/03/2018 20:05       | 1023      | S7_C16_PB1_0503                | x  |
| 05/03/2018 22:52       | 1014      | S9_C2_24m_0503                 | x  |
| 05/03/2018 23:05       | 1025      | S9_C2_24m_0503                 | x  |
| 05/03/2018 23:16       | 1024      | S9_C2_15m_0503                 | x  |
| 05/03/2018 23:28       | 1023      | S9_C2_24m_0503                 | x  |
| 05/03/2018 23:42       | 1017      | S9_C2_5m_0503                  | x  |
| 05/03/2018 23:56       | 1027      | S9_C1_PB1_0504                 | x  |
| 06/03/2018 00:10       | 1024      | S9_C5_PB5_0504                 | x  |
| 06/03/2018 00:19       | 1014      | S9_C5_PB5_0504                 | x  |
| 06/03/2018 00:30       | 1026      | CRM154                         | x  |
| 06/03/2018 00:40       | 1025      | S9_C5_PB6_0504                 | x  |
| 06/03/2018 11:03       | 1024      | S9_C4_22m_0504                 | x  |
| 06/03/2018 11:13       | 1027      | S9_C4_22m_0504_rep             | x  |
| 06/03/2018 11:22       | 1014      | S9_C4_22m_0504_rep             | x  |
| 06/03/2018 11:32       | 1025      | S9_C4_15m_0504                 | x  |
| 06/03/2018 11:42       | 1017      | S9_C4_3m_0504                  | x  |
| 06/03/2018 12:09       | 1025      | S9_C3_PB2_0604                 | x  |
| 06/03/2018 12:21       | 1024      | S9_C3_PB2_0604                 | x  |
| 06/03/2018 12:31       | 1014      | S9_C3_PB5_0604                 | x  |
| 06/03/2018 12:43       | 1023      | S9_C3_PB1_0604                 | x  |
| 06/03/2018 12:55       | 1017      | S9_C3_PB6_0604                 | x  |
| 06/03/2018 13:07       | 1027      | S9_C3_PB3_0604                 | x  |
| 06/03/2018 13:21       | 1026      | S9_C3_PB4_0604                 | x  |
| 06/03/2018 13:34       | 1016      | CRM154                         | x  |
| 06/03/2018 17:37       | 1026      | S9_C11_deep_0603               | x  |
| 06/03/2018 17:52       | 1023      | S9_C11_deep_0603               | x  |
| 06/03/2018 18:04       | 1025      | S9_C11_middle_0603             | x  |
| 06/03/2018 18:17       | 1026      | S9_C11_surface_0603            | x  |
| 06/03/2018 18:31       | 1014      | S9_C11_deep_0603               | x  |
| 06/03/2018 18:46       | 1023      | S9_C10_PB2_0603                | x  |
| 06/03/2018 19:00       | 1014      | S9_C10_PB6_0603                | x  |
| 06/03/2018 19:12       | 1025      | S9_C10_PB2_0603                | x  |
| 06/03/2018 19:25       | 1024      | S9_C10_PB3_0603                | x  |
| 06/03/2018 19:39       | 1026      | S9_C10_PB4_0603                | x  |
| 06/03/2018 19:53       | 1027      | S9_C10_PB1_0603                | x  |
| 06/03/2018 20:06       | 1017      | S9_C10_PB5_0603                | x  |
| 06/03/2018 20:17       | 1011      | CRM154                         | x  |

| <i>Timestamp (UTC)</i> | Sample ID | Stn_Cst_depth_date  | TA |
|------------------------|-----------|---------------------|----|
| 06/03/2018 22:51       | 1023      | S10_C3_27m_0604     | x  |
| 06/03/2018 23:04       | 1024      | S10_C3_27m_0604     | x  |
| 06/03/2018 23:15       | 1025      | S10_C3_27m_0604     | x  |
| 06/03/2018 23:28       | 1027      | S10_C3_3m_0604      | x  |
| 06/03/2018 23:40       | 1026      | S10_C3_20m_0604     | x  |
| 06/03/2018 23:54       | 1023      | S10_C2_PB2_0603     | x  |
| 07/03/2018 00:06       | 1018      | S10_C2_PB2_0603     | x  |
| 07/03/2018 00:18       | 1024      | S10_C2_PB5_0603     | x  |
| 07/03/2018 00:32       | 1016      | S10_C2_PB4_0604     | x  |
| 07/03/2018 00:48       | 1017      | S10_C2_PB3_0604     | x  |
| 07/03/2018 01:05       | 1014      | S10_C2_PB1_0604     | x  |
| 07/03/2018 01:18       | 1011      | S10_C2_PB6_0604     | x  |
| 07/03/2018 01:34       | 1022      | CRM154              | x  |
| 07/03/2018 01:53       | 1016      | CRM154              | x  |
| 07/03/2018 11:07       | 1014      | S10_C5_28m_0703     | x  |
| 07/03/2018 11:22       | 1027      | S10_C5_28m_0703     | x  |
| 07/03/2018 11:34       | 1023      | S10_C5_28m_0703     | x  |
| 07/03/2018 11:45       | 1014      | S10_C5_22m_0703     | x  |
| 07/03/2018 11:56       | 1026      | S10_C5_15m_0703     | x  |
| 07/03/2018 12:07       | 1025      | S10_C5_2m_0703      | x  |
| 07/03/2018 12:19       | 1023      | S10_C5_PB2_0703     | x  |
| 07/03/2018 12:31       | 1024      | S10_C5_PB3_0703     | x  |
| 07/03/2018 12:45       | 1026      | S10_C5_PB6_0703     | x  |
| 07/03/2018 12:59       | 1027      | S10_C5_PB3_0703     | x  |
| 07/03/2018 13:11       | 1017      | S10_C5_PB4_0703     | x  |
| 07/03/2018 13:25       | 1025      | S10_C5_PB5_0703     | x  |
| 07/03/2018 17:31       | 1025      | S10_C11_25m_0703    | x  |
| 07/03/2018 17:45       | 1023      | S10_C11_25m_0703    | x  |
| 07/03/2018 17:57       | 1027      | S10_C11_25m_0703    | x  |
| 07/03/2018 18:11       | 1017      | S10_C11_15m_0703    | x  |
| 07/03/2018 18:25       | 1026      | S10_C11_3m_0703     | x  |
| 07/03/2018 18:39       | 1011      | CRM154              | x  |
| 07/03/2018 18:53       | 1022      | CRM154              | x  |
| 07/03/2018 19:23       | 1027      | S10_C13_28m_0703    | x  |
| 07/03/2018 19:38       | 1025      | S10_C13_28m_0703    | x  |
| 07/03/2018 19:51       | 1014      | S10_C13_28m_0703    | x  |
| 07/03/2018 20:04       | 1017      | S10_C13_15m_0703    | x  |
| 07/03/2018 20:18       | 1022      | S10_C13_3m_0703     | x  |
| 07/03/2018 20:29       | 1024      | S10_C12_PB2_0703    | x  |
| 07/03/2018 20:43       | 1023      | S10_C12_PB1_0703    | x  |
| 07/03/2018 20:56       | 1026      | S10_C12_PB3_0703    | x  |
| 07/03/2018 21:10       | 1017      | S10_C12_PB6_0703    | x  |
| 07/03/2018 21:22       | 1014      | S10_C12_PB5_0703    | x  |
| 07/03/2018 21:31       | 1025      | S10_C12_PB2_0703    | x  |
| 07/03/2018 21:40       | 1027      | S10_C12_PB4_0703    | x  |
| 07/03/2018 21:50       | 1014      | CRM154              | x  |
| 08/03/2018 11:17       | 1014      | S11_C3_23m_0703     | x  |
| 08/03/2018 11:27       | 1026      | S11_C3_23m_0703_rep | x  |
| 08/03/2018 11:37       | 1024      | S11_C3_23m_0703_rep | x  |
| 08/03/2018 11:49       | 1025      | S11_C3_13m_0703     | x  |
| 08/03/2018 11:58       | 1027      | S11_C3_3m_0703      | x  |
| 08/03/2018 12:09       | 1017      | S11_C1_PB1_0803     | x  |
| 08/03/2018 12:18       | 1014      | S11_C1_PB2_0803     | x  |
| 08/03/2018 12:28       | 1023      | S11_C1_PB2_0803     | x  |
| 08/03/2018 12:44       | 1024      | S11_C1_PB3_0803     | x  |
| 08/03/2018 12:59       | 1026      | S11_C1_PB4_0803     | x  |
| 08/03/2018 13:13       | 1025      | S11_C1_PB5_0803     | x  |
| 08/03/2018 13:27       | 1017      | S11_C1_PB6_0803     | x  |
| 08/03/2018 17:38       | 1026      | S11_C9_18m_0803     | x  |
| 08/03/2018 17:54       | 1024      | S11_C9_18m_0803     | x  |
| 08/03/2018 18:10       | 1023      | S11_C9_15m_0803     | x  |
| 08/03/2018 18:24       | 1027      | S11_C9_03m_0803     | x  |
| 08/03/2018 18:36       | 1025      | S11_C9_18m_0803     | x  |
| 08/03/2018 18:52       | 1017      | S11_C8_PB2_0803     | x  |

| <i>Timestamp (UTC)</i> | Sample ID | Stn_Cst_depth_date                  | TA |
|------------------------|-----------|-------------------------------------|----|
| 08/03/2018 19:08       | 1014      | S11_C8_PB3_0803                     | x  |
| 08/03/2018 19:19       | 1027      | S11_C8_PB6_0803                     | x  |
| 08/03/2018 19:31       | 1026      | S11_C8_PB3_0803                     | x  |
| 08/03/2018 19:44       | 1023      | S11_C8_PB5_0803                     | x  |
| 08/03/2018 19:58       | 1024      | S11_C8_PB4_0803                     | x  |
| 08/03/2018 20:10       | 1011      | CRM154                              | x  |
| 08/03/2018 22:33       | 1025      | S11_11_24m_0803                     | x  |
| 08/03/2018 22:43       | 1027      | S11_11_24m_0803                     | x  |
| 08/03/2018 22:54       | 1024      | S11_11_24m_0803                     | x  |
| 08/03/2018 23:07       | 1023      | S11_11_5m_0803                      | x  |
| 08/03/2018 23:16       | 1017      | S11_11_14m_0803                     | x  |
| 08/03/2018 23:28       | 1026      | S11_C10_PB1_0803                    | x  |
| 08/03/2018 23:40       | 1024      | S11_C10_PB2_0803                    | x  |
| 08/03/2018 23:50       | 1025      | S11_C10_PB3_0803                    | x  |
| 09/03/2018 00:02       | 1023      | S11_C10_PB5_0803                    | x  |
| 09/03/2018 00:14       | 1027      | S11_C10_PB4_0803                    | x  |
| 09/03/2018 00:26       | 1017      | S11_C10_PB6_0803                    | x  |
| 09/03/2018 00:39       | 1014      | S11_C10_PB2_0803                    | x  |
| 09/03/2018 00:51       | 1022      | CRM154                              | x  |
| 09/03/2018 01:05       | 1016      | CRM154                              | x  |
| 09/03/2018 11:01       | 1024      | S11_13_24m_0903                     | x  |
| 09/03/2018 11:10       | 1025      | S11_13_24m_0903                     | x  |
| 09/03/2018 11:19       | 1026      | S11_13_24m_0903                     | x  |
| 09/03/2018 11:29       | 1023      | S11_13_20m_0903                     | x  |
| 09/03/2018 11:40       | 1014      | S11_13_5m_0903                      | x  |
| 09/03/2018 12:02       | 1024      | S11_C12_PB2_0903                    | x  |
| 09/03/2018 12:15       | 1023      | S11_C12_PB2_0903                    | x  |
| 09/03/2018 12:29       | 1025      | S11_C12_PB1_0903                    | x  |
| 09/03/2018 12:43       | 1026      | S11_C12_PB3_0903                    | x  |
| 09/03/2018 12:54       | 1027      | S11_C12_PB4_0903                    | x  |
| 09/03/2018 12:57       | 1027      | S11_C12_PB4_0903re                  | x  |
| 09/03/2018 13:06       | 1017      | S11_C12_PB6_0903                    | x  |
| 09/03/2018 13:18       | 1024      | S11_C12_PB5_0903                    | x  |
| 09/03/2018 13:31       | 1025      | boxcore_S13_C01_topwater_0903       | x  |
| 09/03/2018 13:43       | 1026      | boxcore_S13_C01_topwater_0903_rep   | x  |
| 09/03/2018 14:16       | 1025      | boxcore_S13_C02_mixedporewater_0903 | x  |
| 09/03/2018 18:01       | 1023      | S14_C01_198m_0903                   | x  |
| 09/03/2018 18:14       | 1014      | S14_C01_198m_0903_rep               | x  |
| 09/03/2018 18:31       | 1017      | S14_C01_85m_0903                    | x  |
| 09/03/2018 18:44       | 1024      | S14_C01_40m_0903                    | x  |
| 09/03/2018 18:57       | 1025      | S14_C01_15m_0903                    | x  |
| 09/03/2018 19:09       | 1026      | S14_C01_3m_0903                     | x  |
| 09/03/2018 19:30       | 1016      | CRM154                              | x  |
| 10/03/2018 12:08       | 1024      | S15_C01_201m_1003                   | x  |
| 10/03/2018 12:16       | 1017      | S15_C01_201m_1003_rep               | x  |
| 10/03/2018 12:26       | 1025      | S15_C01_201m_1003_rep               | x  |
| 10/03/2018 12:39       | 1027      | S15_C01_3m_1003                     | x  |
| 10/03/2018 12:53       | 1026      | S15_C01_85m_1003                    | x  |
| 10/03/2018 13:04       | 1023      | S15_C01_40m_1003                    | x  |