



environmental affairs
Department:
Environmental Affairs
REPUBLIC OF SOUTH AFRICA



science & technology
Department:
Science and Technology
REPUBLIC OF SOUTH AFRICA



SAEON
South African Environmental
Observation Network



Royal Netherlands Institute for Sea Research

Reference:

SAILING ORDERS

RV *Algoa*

VOYAGE 215

CRUISE:

Agulhas System Climate Array (ASCA) Cruise

CRUISE COMPONENTS:

Agulhas System Climate Array (ASCA) Mooring deployments and CTD survey

SAILING:

Cape Town, Tuesday, 7 April 2015, 12h00

CHANGE-OVERS:

Port Elizabeth: 16-17 April (change-over)

Port Elizabeth: 24-25 April (ASCA launch)

RETURN:

Cape Town, Sunday, 26 April 2015

AREA OF OPERATION:

RV *Algoa* will operate off Hamburg, south of East London, South Africa, for the ASCA mooring deployments and CTD survey.

SCIENTIFIC RATIONALE:

The Agulhas System Climate Array is an international oceanographic project with partners from South Africa, the United States of America (USA), and the Netherlands, and funding support from the South African Departments of Science and Technology (DST) and Environmental Affairs (DEA), the US National Science Foundation (NSF) and the Royal Dutch Institute for Sea Research (NIOZ). It is designed to provide long term observations of Agulhas Current volume, heat and salt transport and its variability from mesoscale (eddies), through seasonal to interannual timescales. This will be achieved by means of two shelf and seven full-depth tall moorings, interspersed with five Current- and Pressure-recording Inverted Echo Sounders (CPIES), measuring pressure, current velocities, temperatures and salinities. The ASCA shelf and tall moorings will extend 200 km offshore along the descending TOPEX/Jason satellite ground track # 96, through the core of the Agulhas Current, with CPIES measurements extending the array to 300 km (~ 160 nm) offshore.

For this first deployment cruise, only the two shelf moorings and the first four tall moorings will be deployed, with the rest of the moorings and CPIES planned for deployment in 2016 when these first moorings are serviced. The cruise will be complimented by a Conductivity, Temperature and Depth (CTD) survey along the full ASCA transect (~ 160 nm), with underway chemistry and ship-borne Acoustic Doppler Current Profiler (ADCP) surveys, SVP Drifter and Slocum Glider deployments.

CRUISE OBJECTIVES:

1. Deploy two shelf moorings (C1 and C2) and four tall moorings (A-D) as part of the ASCA Mooring array, off Hamburg just south of East London.
2. Undertake 2 x S-ADCP transects along the ASCA mooring array line. The first from Mooring C1 to D at the beginning of the mooring leg to assess the bathymetry and the actual currents along the transect (~ 46 nm); the second from CTD 20 to CTD 1 after the CTD survey on Leg 2 (~ 160 nm)

MG.



Reference:

3. Deploy two gliders inshore of the Agulhas Current to do shelf interaction surveys for ~ 2 months. The gliders will be retrieved by the SAEON Elwandle team, once the survey along shelf edge is complete.
4. Deploy 10 x SVP drifters (split between legs 1 and 2), along the Sentinel-1 swath overpass on leg 1, and along the ASCA CTD survey on leg 2.
5. Undertake 20 x CTD stations along the ASCA line for physical and chemical oceanographic parameters, biogeochemistry, microplankton and phyto- and zooplankton net sampling.
6. Undertake underway microplankton sampling along ASCA CTD survey transect, if station spacing further than 15 minute degrees apart
7. Undertake underway chemistry sampling from Cape Town to Cape Town (i.e. entire duration of the cruise)
8. The vessel will be involved with the ASCA science launch at the end of the cruise showcasing the project and highlighting the achievements made on this inaugural deployment cruise

GEAR:

- CTDO/Rosette sampler for depth profiling of Conductivity (salinity), Temperature and Oxygen concentration - DEA
- Vertical and Oblique Bongos – DEA
- Continuous Plankton Recorder (CPR) - DEA
- Hydrographic sampling equipment - DEA
- pCO₂ system and scientific sea water supply - DEA
- TSG system and scientific water supply - DEA
- Oxygen; chlorophyll and Nutrient sampling equipment - DEA
- ADCP (hull-mounted) for en-route measurements of water column currents; Hull-mounted on Algoa – DEA
- Mooring deployment equipment – DEA, SAEON / BCRE, NIOZ
- iRobot Sea-Gliders – CSIR
- SVP Drifters – SAEON / SAWS
- Cranes and winches required: hydrographic and vertical plankton winch, pesci crane aft –RV Algoa
- Work boat to assist with mooring deployments if needed - RV Algoa

PERSONNEL: Leg 1: Mooring Deployments

| # | Name | Medical expiry date | Responsibility |
|---|---|---------------------|---|
| 1 | Herman Ridderinkhof (NIOZ) | 6 | Chief Scientist |
| 2 | Tamaryn Morris (SAEON)* | 25/02/2016 | Moorings, ASCA Logistics, Data Management (SAEON) |
| 3 | Bradley Blows (BCRE) | 26/06/2015 | Moorings |
| 4 | Leon Wuis (NIOZ) | 20/05/2016 | Moorings |
| 5 | Gavin Louw (DEA) <i>- Co-lead Scientist - responsible DEA</i> | | Moorings and Data Management (DEA) |
| 6 | Fehmi Dilmahamod (SAEON Student) | | Mooring training |
| 7 | Xolisa Dlomo (SAEON Student) | | Mooring training |



Reference:

| | | | |
|----|--|--|--------------------------------|
| 8 | Jarred Voorneveld (CPUT Student) | | Mooring training |
| 9 | Jethan d'Hotman (CPUT Student) | | Mooring training |
| 10 | Khaya Siswana (DEA) | | Underway chemistry |
| 11 | Mbulelo Makhetha (DEA) | | Moorings |
| 12 | Beate Holscher (SAEON)* | | Media relations |
| 13 | Katherine Moffett (CPUT Student - tbc)* | | Mooring training |
| 14 | Elijah Ramphago (DEA Intern) | | Mooring training / Electronics |

PERSONNEL: Leg 2: CTD Survey

| # | Name | Medical expiry date | Responsibility |
|----|--|---------------------|---|
| 1 | Herman Ridderinkhof (NIOZ) | | Chief Scientist |
| 2 | Tamaryn Morris (SAEON)* | 25/02/2016 | CTD operator, sampling, ASCA Logistics, Data Management (SAEON) |
| 3 | Marjolaine Krug (CSIR)* | | Glider deployments |
| 4 | A. N. Other (CSIR / STS) | | Glider deployments |
| 5 | Gavin Louw (DEA) | | CTD operator, sampling and Data Management (DEA) |
| 6 | Khaya Siswana (DEA) | | Underway chemistry, CTD sampling, (net sampling assistance) |
| 7 | Mbulelo Makhetha (DEA) | | CTD operator and sampling |
| 8 | Estee Vermeulen (SAEON Student)* | | CTD and Zooplankton net sampling |
| 9 | Fehmi Dilmahamod (SAEON Student) | | CTD and Zooplankton net sampling |
| 10 | A. N. Other (DEA)* <i>Elana Wright</i> | | Zooplankton nets |
| 11 | Leandro Ponsoni (NIOZ) | | CTD and Zooplankton net sampling |
| 12 | Mfundo Bizane (SAEON) | | Elwandle Node sampling |
| 13 | Xolani Methu (DAFF) | | Electronics Technician |
| 14 | Elijah Ramphago (DEA Intern) | | Electronics (training) |

*Denotes female

Cabins to be allocated onboard

**Scientific staff are required to board the vessel one hour prior to sailing.
Kindly report your arrival to the Chief Scientist**

GENERAL CRUISE PLAN:

01 + 02 April 2015

Final loading of gear, and spooling of cable onto net drum, in Cape Town

07 April 2015, 12h00

Depart from Cape Town

M.G.



Reference:

07 – 15 April 2015

16 April 2015

17 – 23 April 2015

24 April 2015

27 April 2015

ASCA mooring deployments off Hamburg, south of East London

Change-over in Port Elizabeth

ASCA CTD survey – 20 stations, Slocum glider deployment and SVP drifters deployment

Dock in Port Elizabeth for educational outreach and launch programs

Dock in Cape Town

DETAILED SCIENTIFIC WORK PLAN:

Leg 1 – Mooring Deployments:

The vessel will sail from Cape Town on 07 April and head directly for CTD 1 position (-33 20.6280 S, 27 28.8480 E). The vessel will then steam along the ASCA array to position Mooring D (-34 1.2420 S, 27 51.7980 E), collecting S-ADCP data while the CS and mooring technicians assess bottom topography for deployments – particularly for C2 (80 m) and C3 (120 m). Mooring deployments will begin at Mooring D, and work backwards in to Mooring C2 on the shelf. Triangulation of each mooring will be undertaken directly after deployment. Vessel will then proceed to Port Elizabeth for change-over (16 April). C2 and C3 shelf moorings are DEA moorings, and moorings A-D are NIOZ / SAEON moorings. Appendix A shows the vertical section of mooring deployments, and mooring B the actual layout of the moorings A-D in terms of instrumentation. Mooring C2 and C3 are shelf moorings with only a floatation buoy, with ADCP, acoustic releases and counter weights, and a Microcat on C3. Four SVP drifters will be deployed on leg 1 dependent on Sentinel-1 overpass dates and location.

Vessel will dock in Port Elizabeth to change-out scientific crew and equipment before CTD survey leg.

A CPR will be towed from Cape Town to the start of this ASCA line collecting underway zooplankton data. The vessel will need to proceed at a minimum speed of 10 knots in order to collect good data on the CPR.

Leg 2 – CTD and zooplankton net survey:

Vessel will sail from Port Elizabeth on 17 April morning (latest) and proceed to Sentinel-1 position for SVP drifter deployments. SVP drifters will be deployed dependent on Sentinel-1 overpass dates and location throughout leg 2 to obtain best coverage. Thereafter the vessel will proceed to the first glider deployment position. The second glider will be deployed 2-3 days after the first, thus on return transect after the CTD survey. **NOTE: Glider deployment should be south-west of mooring deployment positions to avoid entanglement with mooring cables.**

The vessel will then proceed to CTD position 1 (-33 20.6280 S, 27 28.8480 E) to begin the CTD survey. At each CTD station, a cast to within 5 m off the bottom, or a maximum depth of 1000 m will be done to collect water for samples and calibration. A second cast may be needed for additional water at surface and F-max (thus ~ 200 m), particularly on the deeper stations. This will be at the discretion of the CTD operator at the time of sampling the first CTD cast. A vertical bongo cast (2 x 200 um) will be done to within 5 m of the bottom, or a maximum of 200 m. Lastly, the vessel will proceed away from station towing an oblique bongo (300 um and 500 um), from 5 m from the bottom or 200 m, to the surface. After each station, the vessel will need to return to the line before proceeding on to the next station to remain as close to the predetermined transect as possible. **NOTE: The CTD stations where moorings have been deployed already, should be undertaken slightly south-west**

M.G.



Reference:

of the mooring deployment site (use triangulation data from mooring deployments to confirm exact position) to ensure no entanglement with CTD cable.

An S-ADCP transect will be undertaken back along the ASCA transect to collect current data before the vessel proceeds to Port Elizabeth.

The vessel will dock in Port Elizabeth for education and outreach tours and the ASCA launch. The vessel will be able to leave for Cape Town on the afternoon of 24 April after the ship tours are completed or the following day depending on vessel requirements in port.

Underway chemistry work:

Underway samples will be collected from the scientific pumped TSG system every 15 nautical minutes from the start of the cruise while the ship is on underway transects (i.e. NOT on mooring deployment sites and CTD survey). Samples for dissolved oxygen, salinity and chlorophyll *a* will be undertaken, along with DIC and pCO₂ on the dedicated underway sample system.

Launch

A two-fold program is planned for the 24th of April when the ASCA project will be officially launched to the public in Port Elizabeth.

The first is the educational tours of the vessel, which will host 5 -6 half hour tours of learners from schools around Port Elizabeth through the vessel. This will begin at 9:30 am and end around 1 pm. The final tour will be for dignitaries and invited guests to the afternoon launch at NMMU.

The reception and media event at NMMU will host Department of Science and Technology (DST) and Department of Environmental Affairs representatives, SAEON Node Scientists and students, ACEP, SAIAB and other interested science teams, local government from the Eastern Cape, Captain and officers from the RV *Algoa* and the media amongst others. The event will begin at 2:30 pm, after dignitaries have toured the vessel.

The full program is being developed and will be available for the Captain and officers prior to sailing. The vessel can sail for Cape Town once these launch activities are complete.

The DEA media accessories such as branding material and any other demonstration models and/or equipment will be displayed. SAEON manages responsible for all logistics coordination around the vessel tours.

I am concerned about the preparation of the vessel to receive so many learners and guest. SAEON to demonstrate to Mr Grubkauer the preparation to receive learners and guests. Mr Grubkauer must be satisfied that M.G.

all necessary considerations are made, especially safety.



Reference:

Station Positions:

| Mooring # | Latitude | Longitude |
|--------------------|------------------------------------|------------------------------------|
| Shelf Mooring – C2 | To be determined on survey – 80 m | To be determined on survey – 80 m |
| Shelf Mooring – C3 | To be determined on survey – 120 m | To be determined on survey – 120 m |
| Tall Mooring A | -33 33.3648 | 27 35.7060 |
| Tall Mooring B | -33 39.4260 | 27 39.0540 |
| Tall Mooring C | -33 46.9800 | 27 42.9300 |
| Tall Mooring D | -34 1.4460 | 27 51.8880 |

| CTD Station # | Latitude | Longitude |
|---------------|-------------|------------|
| 1 | -33 20.6280 | 27 28.8480 |
| 2 | -33 27.7980 | 27 32.9220 |
| 3 | -33 33.3900 | 27 35.9340 |
| 4 | -33 35.7420 | 27 37.5000 |
| 5 | -33 39.2160 | 27 39.4740 |
| 6 | -33 42.1980 | 27 41.2140 |
| 7 | -33 46.9380 | 27 43.1880 |
| 8 | -33 53.7000 | 27 47.8860 |
| 9 | -34 1.2420 | 27 51.7980 |
| 10 | -34 8.2020 | 27 56.3580 |
| 11 | -34 17.1900 | 28 1.5540 |
| 12 | -34 24.0000 | 28 5.6640 |
| 13 | -34 32.3220 | 28 9.7320 |
| 14 | -34 40.3800 | 28 15.3960 |
| 15 | -34 49.3140 | 28 20.7180 |
| 16 | -34 57.4860 | 28 25.6620 |
| 17 | -35 9.1020 | 28 32.6640 |
| 18 | -35 20.7600 | 28 39.7320 |
| 19 | -35 31.9980 | 28 46.6200 |
| 20 | -35 44.0280 | 28 54.0000 |

| SVP Drifter Deployments | Latitude | Longitude |
|-------------------------|----------|-----------|
| 1 | tbc | tbc |
| 2 | tbc | tbc |
| 3 | tbc | tbc |
| 4 | tbc | tbc |
| 5 | tbc | tbc |
| 6 | tbc | tbc |
| 7 | tbc | tbc |
| 8 | tbc | tbc |
| 9 | tbc | tbc |
| 10 | tbc | tbc |

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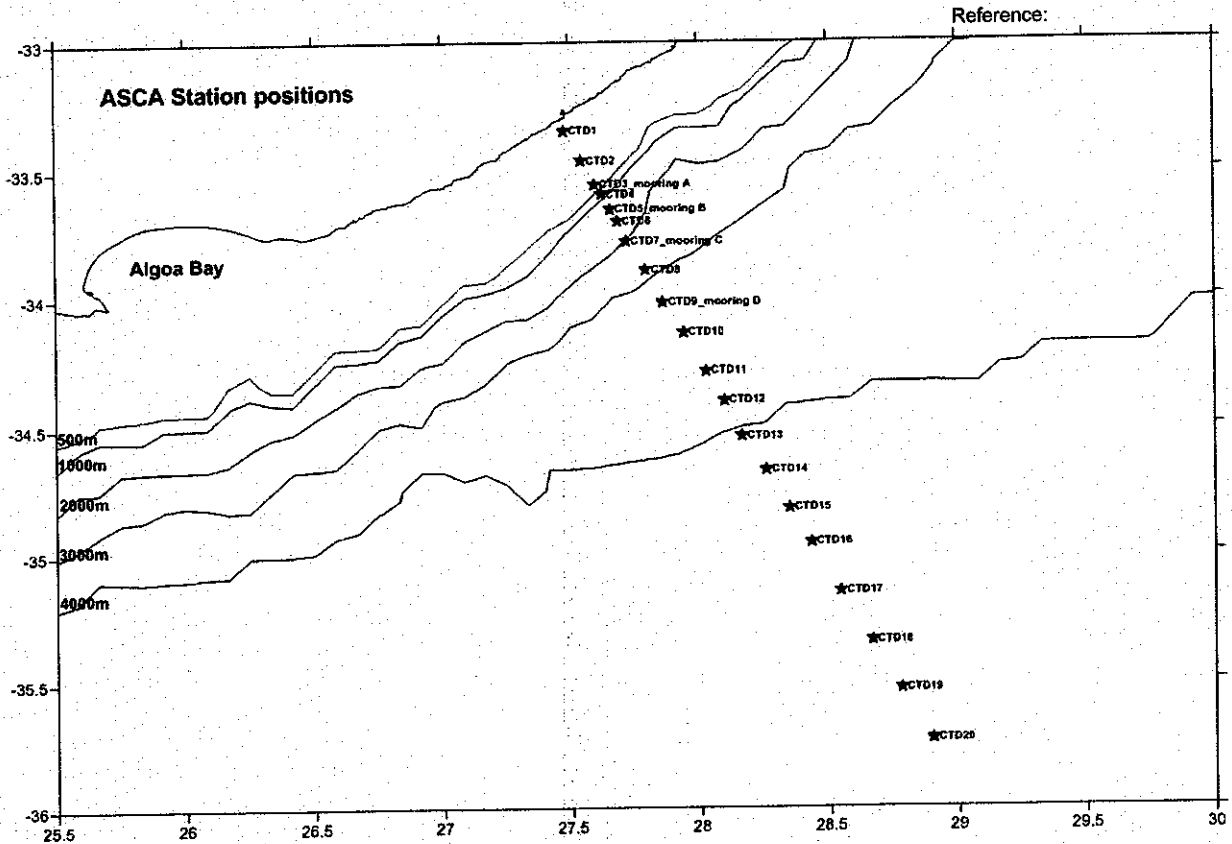


Figure 1: Mooring and CTD station position map

Glider deployment positions:

The gliders will be deployed on CTD station #4, the first on the CTD survey leg and the second on the transect back in to the coast. A CTD will be undertaken (with sampling for dissolved oxygen, salinity and chl a) at each deployment. A CTD should be undertaken on the vessel's return to Port Elizabeth at the last reported position of the gliders (most likely only the first glider, as the second would only just have been deployed) for calibration purposes.

Sampling Protocols for CTD Survey:

Nutrients

Seawater samples will be collected in 15ml sample tubes at selected depths at every CTD station and stored in a -20° C freezer. Additional surface nutrient samples will be collected every 15 minutes on underway transects. Labelling of underway nutrients must be clearly distinguished from those collected on the ASCA transect. Depths for nutrient samples should be targeted around the temperature and fluorescence trace and not at standard depths. The sample tubes must be rinsed three times with water from the Niskin bottle, before the sample is tapped. The sample tubes should not be filled capacity to allow for expansion during freezer (thus ¾ full). Nutrient analysis will be determined using an Auto Analyzer obtained from Astoria, in the laboratory at Ocean and Coasts, DEA.

M.G.



Reference:

Dissolved O₂

For calibration of the pCO₂ system – Underway Samples: Idronaut oxygen sensor - seawater samples will be collected underway four hourly intervals from a scientific seawater supply for onboard determination of dissolved O₂ with a Titrino using the Winkler method.

For calibration of the CTD oxygen sensor – CTD survey (Leg 2): Seawater samples will be taken from selected depths on CTD stations, in **triplicate**, for the determination of dissolved O₂ onboard with a Titrino using the Winkler method. Depths will be determined at areas of interest from the dissolved oxygen trace and the overall linear regression for the cruise should have targeted low, average and high oxygen regions within the water column. The dissolved oxygen samples will be tapped using plastic tubing to the bottom of the sample bottle to avoid the accumulation of microscopic bubbles. The water should overflow out of the container for at least 30 seconds, before the tube is carefully removed (avoid create bubbles). Thereafter the reagents will be added and the sample agitated and allowed to settle for analysis. If any bubbles in the sample bottle, the sample should be retaken. Triplicate samples will be taken for calibration purposes.

Salinity

For calibration of the pCO₂ salinity sensor – Underway Samples: Seawater samples will be collected underway at four hourly intervals from a scientific seawater supply. Samples will be analyzed after the cruise

For calibration of the CTD salinity sensor – CTD survey (Leg 2): Seawater samples will be taken from selected depth on CTD stations, with at least one **triplicate** per station. Depths will be determined at areas of interest from the salinity trace and the overall linear regression for the cruise should have targeted low, average and high oxygen regions within the water column. The sample bottle (and cap) should be rinsed three times with the water from the Niskin bottle and filled ¾ volume to ensure no salt crystals develop at the neck of the bottle. The bottles must be securely tightened and stored in the lab at a relatively stable temperature and away from direct sunlight. Samples will be analyzed after the cruise using an Autosal machine located at East Pier.

Chlorophyll-a

For calibration of the CTD fluorescence sensor – CTD survey (Leg 2): 500ml of seawater will be taken from a maximum of six depths, targeted around the F-Max, on CTD stations. Additional surface chlorophyll-a samples will be collected every 15 minutes on underway transects. Samples will be filtered, folded, and then wrapped in a foil and stored in the -80° C freezer for analysis in the Ocean and Coasts, DEA, laboratory once the cruise has returned to Cape Town.

Pigment and Absorption Samples:

A second cast of the CTD at all stations will be undertaken to ~ 200 m to collect additional water at the surface and F-Max for pigment and absorption samples. This will be decided given the depth and samples taken from the first CTD cast (i.e. is a second cast needed). Four liters of water from each depth will be filtered and stored in the -20° C freezer for HPLC and absorption analysis in the Ocean and Coasts, DEA laboratory once the vessel has returned to Cape Town.

M.G.



Reference:

Microplankton

Seawater samples for microplankton analysis will be collected from near-surface at CTD stations and at 15 degree minute intervals while underway along the entire ASCA CTD transect. One five-litre water sample from each location is to be filtered through a 200- μm mesh, collected on a 20- μm mesh, and rinsed into phytoplankton jars using 0.7 μm filtered sea water (FSW). Samples will be labeled and preserved with 4% formalin for FlowCAM analysis in the Ocean and Coasts, DEA laboratory once the vessel has returned to Cape Town.

Zooplankton samples

Samples collected with the bongo nets (2 x 200 μm and 300 + 500 μm mesh) are to be concentrated using a 200 μm mesh sieve, rinsed into honey jars using ± 35 μm FSW, and preserved with 4% formalin.

Satellite Images:

Dr. Marjolaine Krug will supply the vessel daily with a merged SST 2 km resolution satellite image, overlaid with vectors from Aviso absolute geostrophic currents to a) assist with the deployment of the moorings on leg 1 and b) to actively deploy the SVP drifters and gliders in to regions of interest in relation to the Sentinel-1 satellite overpass region and to compliment the CTD survey. The Sentinel-1 overpass regions will only be known 2-3 weeks in advance of deployment.

DATA MANAGEMENT AND POLICY

The points listed below are taken directly from the ASCA Business Plan:

- ASCA PI's and associated students will have immediate access to raw data as they "walk off the ship" following ASCA maintenance cruises.
- Data will be quality controlled, processed, and archived in South Africa (skills transfer)
- Data will be stored at SAEON and the DEA, and passed to SADCO (Southern African Data Centre for Oceanography) and the US NODC (National Oceanographic Data Centre) within 12 months of retrieval, with open access granted to the international scientific community.
- In addition to this, as ASCA will be part of the Indian Ocean Observing System (IndOOS) we will adhere to its data policy which states "The data from the observing components that are included in IndOOS are open to the public and must be made easily accessible, with reasonable time lag for the data quality check. IndOOS has its own data portal and all the data from IndOOS should be listed on the data portal and accessible through it."
- Metadata will be placed on the Nairobi Convention Clearing House Mechanism and used to support the ASCLME's Marine Ecosystem Diagnostic Analysis (MEDA). Each of the East African countries involved in the ASCLME has created a MEDA which will be used to produce a Strategic Action Plan and Transboundary Diagnostic Analysis for the region and data handling, quality control and processing of data through a 'Science-to-Governance' process is also evolving rapidly through a number of bilateral and multilateral agreements.

STATIONS: NUMBER ALLOCATION

Each CTD cast will constitute a station. Stations will be allocated a consecutive number from C-001 (first station) for simplicity.

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Royal Netherlands Institute for Sea Research

Reference:

SCIENTIFIC LOG:

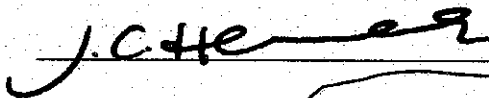
A logbook will be provided on the bridge for comments. Any member of the scientific team, or the Master and his officers are entitled to make an entry in the logbook at any time, relating to the conduct of the scientific work or equipment performance.

CRUISE REPORT:

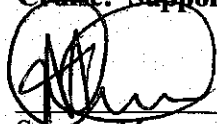
The Chief Scientist will incorporate comments from the scientific log into the cruise report. All project leaders (including visiting researchers and students) must submit a brief report to the Chief Scientist on completion of their part of the cruise summarizing the work done and objectives achieved. The cruise report should be submitted electronically at all the signatories of the sailing orders thirty (30) days after the cruise is completed.

Cruise proposed by: Dr Juliet Hermes
Chief Scientist: Herman Ridderinkhof

Date: 9th March 2015

 signed on behalf by Dr. Juliet Hermes

Cruise: Supported / Supported with amendments / Not Supported



Science Manager: Ocean & Environment Interaction Research

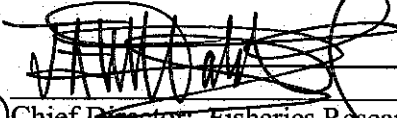
24/03/2015
Date:

Cruise: Supported / Supported with amendments / Not Supported



Director: Oceans Research Biodiversity and Coastal Research Date: 25.03.2015

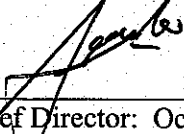
DAFF Personnel Participation: Approved / Approved with amendments / Not Approved



(Acting) Chief Director: Fisheries Research, Department of Agriculture, Forestry and Fisheries

Date: 25.03.2015

Cruise: Approved / Approved with amendments / Not Approved



Chief Director: Oceans and Coastal Research

Date: 26/3/2015

I have also nominated Mr. Louw as co-chief scientist to represent DEA on this cruise. Decisions on cruise operations are to be made in consultation between Chief Scientist.



Reference:

APPENDIX A

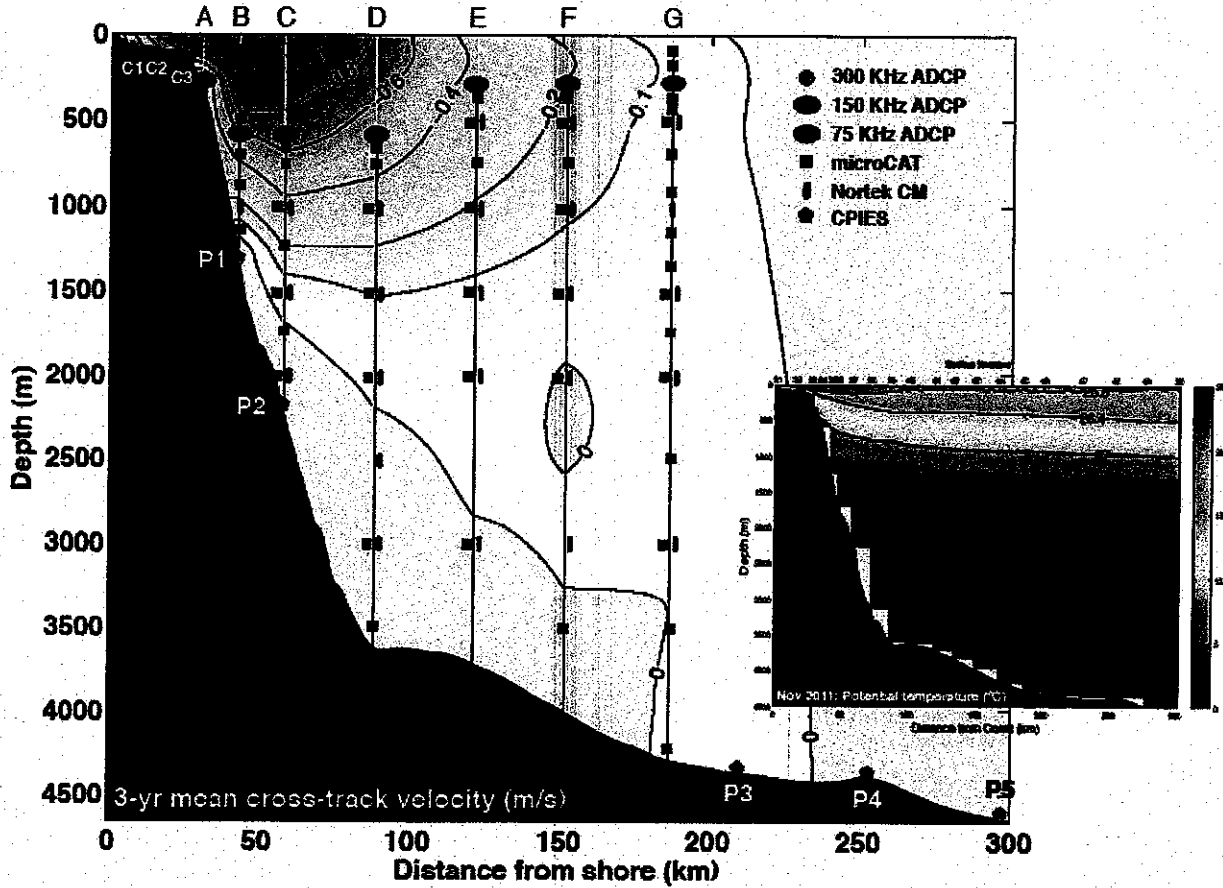


Figure 2: Vertical section of three-year cross-track velocity with mooring deployments in profile. Moorings C2 and C3, A – D will be deployed on this cruise.

M.G.



Reference:

Agulhas Mooring A 2015

Buoyancy units - Fictation Buoy 40 Inch - ADCP 1500

B: -178.09 kg: 372.07 h: 0

Instrument - MicroCat SBE 37-SMP

B: 2.2 kg: 3.7 h: 0

Release - Acoustic Release, IXSEA AR263 825

B: 48.57 kg: 76.5 h: 207.09

Anker - Antergewicht (500 kg)

Remains on the seabed

B: 510.22 kg: 585.56 h: 558

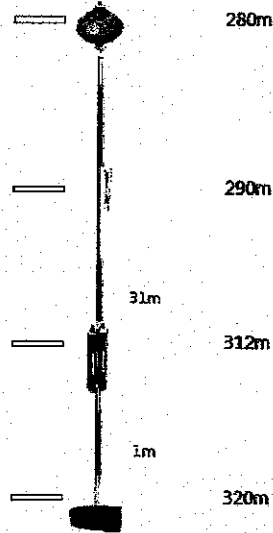


Figure 3: Mooring A

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Reference:

Agulhas Mooring B 2015

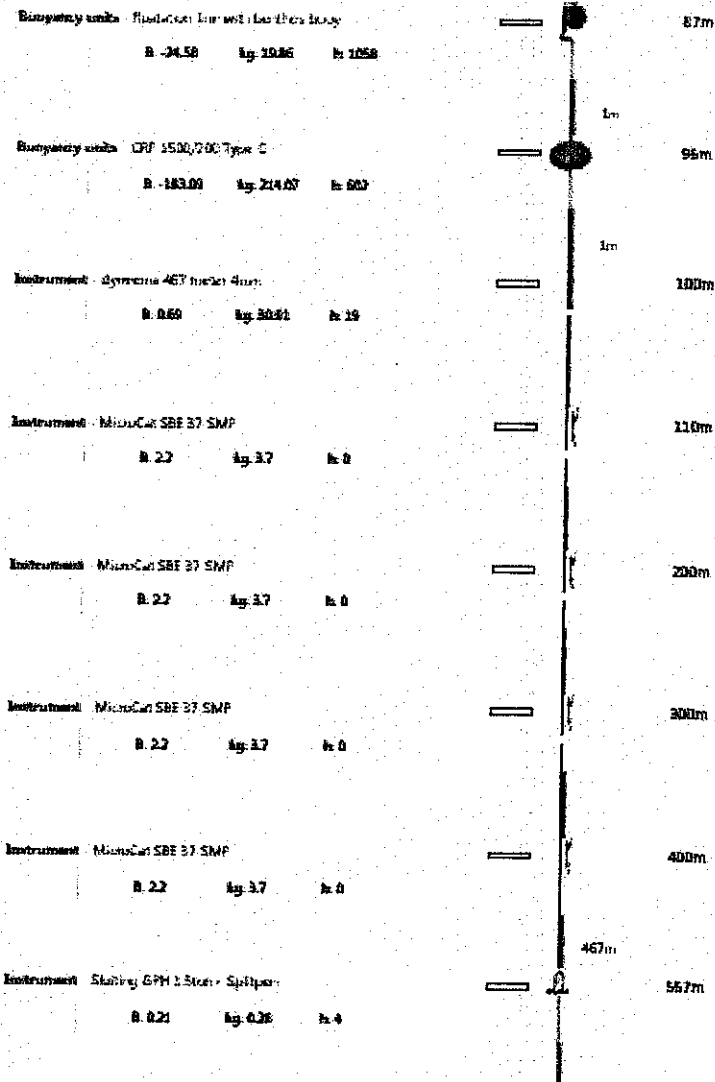


Figure 4: Mooring B (top section)

M. G.



Reference:

Agulhas Mooring C 2015

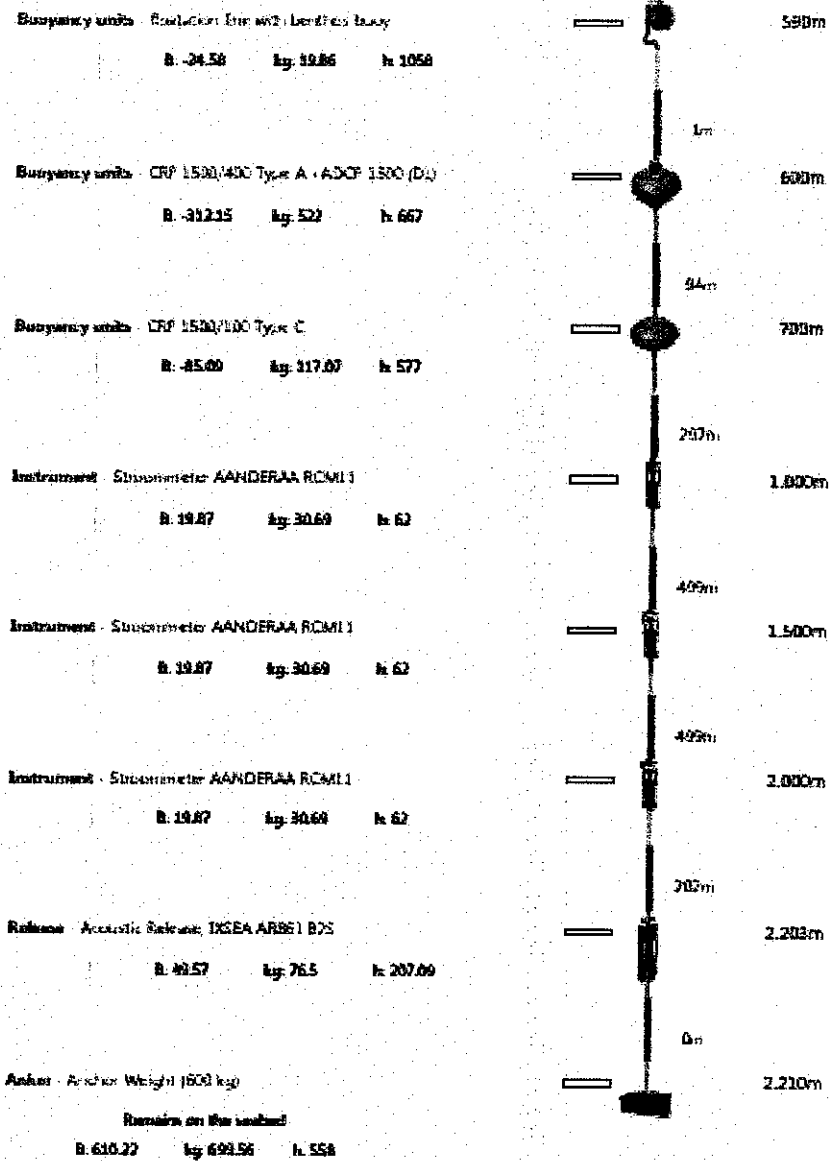


Figure 5: Mooring C

M-G.



Reference:

Agulhas Mooring D 2015

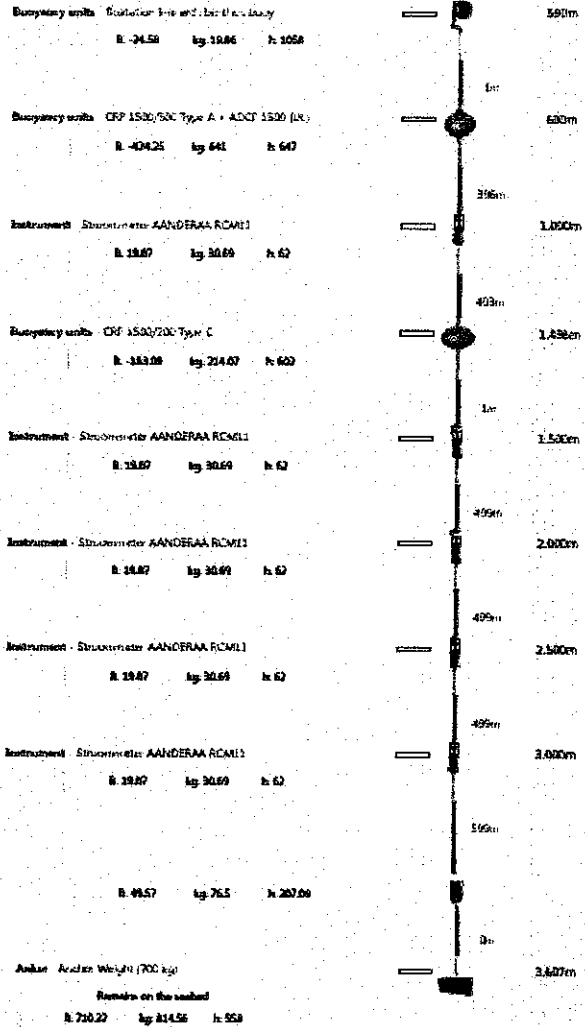


Figure 6: Mooring D

M.G.



Reference:

APPENDIX B

The Department of Environmental Affairs (DEA) welcomes all voyage participants onboard the research vessel Algoa. It is the DEA's wish that all participants will have a safe, healthy and a pleasant stay for the duration of the cruise.

The DEA is mandated to ensure the protection of the environment and conservation of natural resources, balanced with sustainable development and the equitable distribution of the benefits derived from natural resources. In its quest for better use and management of the natural environment, the Department of Environmental Affairs is guided by its constitutional mandate, as contained in Section 24 of the Constitution.

The Department of Environmental Affairs fulfils its mandate through formulating, coordinating and monitoring the implementation of national environmental policies, programmes and legislation. The Vision and Mission of the DEA are:

Vision

A prosperous and equitable society living in harmony with our natural resources.

Mission

To create a prosperous and equitable society that lives in harmony with our environment.

This research ship is a property of DEA, managed and administered by the Branch: Oceans and Coasts (O&C) which has to ensure that "present and future generations of South Africans live in harmony with and benefit from a healthy, well-functioning ocean and coastal environment. This is to be fulfilled by "conducting research for improved understanding and response of the ocean and coastal environment and ecosystems and providing adequate relevant and reliable information in support of effective management, protection and conservation of this environment.

Safety at Sea

1. International Safety Management Code (ISM Code) - The Code came into effect in July 1998 (dated back to 1980's) due to inadequate safety standards onboard some vessels and the inappropriate management control. All passengers and personnel onboard are therefore obliged to conform to these regulations and in order for the vessels to remain classified, audits are carried out by Lloyds International and/or Bureau Veritas (BV).

The objective of the Code: – To ensure safety at sea, prevention of human injury, loss of life and protection of the marine environment.

The ISM Code ensures that:

- Safe practices in ship operations and a safe working environment
- Establish and safeguard against identified risks
- Continuously improve the safety management skills of personnel
- Preparing for emergencies.

2. International Ship and Port Security Code (ISPS Code) – This Code came into effect in 2002 as a result of the 11 September 2001 terrorist attacks.

Internationally **ALL** vessels and **ALL** ports have to comply with the ISPS CODE.

The main aim is to ensure that adequate protection measures are in place for vessels and their crew.

Ships have been identified as a major platform that can be used in terror attacks. Hence the strict security at the port access points.

M.G.



Reference:

SAFETY AT SEA:

The Departments vessels and ships are managed by a registered shipping and manning company and we are therefore obliged to comply with the appropriate safety regulations. The following instructions are therefore enforced for ALL seagoing personnel and non-seagoing personnel i.e. visitors to the vessel.

- The ship is a floating platform or laboratory for the collection and processing of scientific data. It is a place of work.
- Damage to scientific equipment has previously been reported, personnel are hereby advised to keep their electronic and scientific equipment (computers, laptops, cameras, etc) in safe and dry areas in case there is an instance of a ship flooding.
- During an Emergency/Fire Drill, when personnel are gathering to the Muster Area they are to bring along their Life Jacket, wear closed shoes, head gear and warm clothing. Personnel should adhere to these emergency procedures as they part of the International Safety Standards.
- All visitors to the vessel are to wear appropriately closed shoes for the cabin accommodation area and safety shoes on the deck or any working area.
- If possible wear tight-fitting clothing e.g. an overall to avoid loose garments being caught in machinery. Visitors are liable for their safety onboard, and in a case of an accident and the visitor is found not wearing appropriate safety clothing, neither the Department nor the Ship management Company will be held responsible.
- Visits to all machinery compartments are by prior arrangement from the Chief Engineer.
- No personnel is allowed in the galley or cooking area, except the catering staff.
- Prior to any electrical work (e.g. changing plugs, installing electrical cables, etc) being done, prior consultation with the electrical engineer or the electronic technician, where necessary.
- When the vessel is in port you may only board via the gangplank. Jumping on or off over the side of the ship is prohibited. This may also be enforced at times on the smaller ships when conditions are deemed to be unsafe.
- Depending on a vessel, no loading or offloading of equipment is allowed over the side of the ship. All equipment should be put into the loading bins and/or loading net and hoisted by crane onto or from the vessel. Please contact the duty officer or *Bosun* prior to loading to insure you have required assistance. The hero's platform may also be used for loading at the discretion of the Officer-on-Duty.
- All scientific equipment must be stowed away safely and securely in designated areas in such a way that they are not blocking access to any access points or equipment. This must be checked by the ship's safety officer (Chief Engineer or Bosun), prior to sailing.
- Personnel should be aware that any equipment no matter how small can be a potential hazard in rough weather, therefore all equipment should be stowed securely even in calm weather as weather conditions can change unexpectedly.
- Scientists are expected to present a safety data sheet for all chemicals or substances brought onboard the vessel to the Chief Scientist who will make this data sheet available to the ship's safety officer.
- Chemicals in use must be stored safely in the appropriate laboratories. There are chemical storage cupboards in every vessel, enquire from the Captain or the Officer-in-charge. Appropriate containers and bottles should be used to safely store or transport these chemicals
- In case of a chemical spillage, the Ship's Safety Officer should be informed immediately and appropriate chemical absorbent such as "*Chemisorb*" must be used to cleanup the spillage. It is the responsibility of the scientific personnel to bring and provide the absorbing/cleaning chemical onboard.
- When using hazardous chemical substances appropriate personal safety gear i.e. goggles, mask and/or gloves must be used at all times and should be brought on board by the scientists concerned.



Reference:

- Hard hats must be used in all outside work areas where overhead operations are taking place.
- Only appropriate safety shoes are allowed on deck, any other shoes e.g. Sandals, and/or "Crocs" are not allowed on deck. At the work areas, hard hats, safety boots/shoes areas are to be worn at all times. **All visitors must provide their own safety gear.**
- Crossing of any deck while operations are in progress is prohibited.
- **If any injury occurs an "Injury On Duty (I.O.D)" form must be filled in and the incident reported to your supervisor.**
- **If any injury occurs** personnel must call the Ships Medical Officer for assistance (by dialling the Wheelhouse/bridge). If the situation is such that you have to assist with first aid put on protective gloves first if you can administer First Aid.
- Personnel participating on a cruise should adhere to the stipulated departure times. The ship will, in all likelihood, leave them behind and there will be financial implications.

POST CRUISE PROCESSES

The undertaking of research cruise is an important and an integral part of the DEA, and the collected information and data are crucial towards the understanding of our marine environment. The continuous investment by the DEA on these cruises thus needs to be accounted for and its value need to be reported on. It is therefore important that the post-cruise processes are followed, with an aim of accounting for the investment and commitment by the Department.

The Chief Scientist in conjunction with the Captain, are thus required to ensure that a post cruise meeting, also known as the "**washup meeting**" is arranged as soon as possible after the cruise, preferably **less than 1 week** after the cruise. During the "washup" meeting all aspects pertaining to the cruise (technical, mechanical, equipment, personnel, etc) should be discussed. If there were any problems during the cruise these should be discussed during these meetings. The minutes of the meeting should be delivered/addressed to the relevant DEA authorities for consideration.

Cruise reports are an important part of the cruise. The Chief Scientist of the cruise is expected to prepare the cruise report and submit it to the DEA authorities of Oceans and Coastal Research (e.g. Directors and Chief Director). The report should be submitted within a month (30 days) after the cruise has been completed.

M-G.



Reference:

APPENDIX C

RESEARCH VESSELS GENERAL CODE OF CONDUCT & INFORMATION

- MEAL TIMES at sea.

| | |
|-----------|---------------|
| Breakfast | 07h30 – 08h30 |
| Lunch | 11h30 – 12h30 |
| Dinner | 17h30 – 18h30 |

- Meal times have been designed after consultation as such personnel are required to adhere to these as they affect the scheduling of the crew. Should any scientific personnel not be able to adhere to these due to the nature of their duties, they should make prior arrangement.
- Personnel should wear smart casual clothes during meal times and/or in the main mess. In the case where the personnel are on duty and are wearing “work clothing”, the personnel should utilize the designated area for eating.

SMOKING POLICY

- Smoking of tobacco products is prohibited inside the ships accommodation, work area and/or any other public areas. Should personnel wish to smoke they are requested to do so at a designated area where required resources (ash tray, ash receptacles, disposal trays, etc) are provided to dispose related litter. The smoking policy will be strictly adhered to, as it follows relevant regulations.
- “Good” drinking water and fresh water is provided, but limited personnel are encouraged to be considerate by conserving as much fresh water as possible.
- Officers/Scientists/ Lounge – All glasses, mugs, ashtrays, etc that belong to the lounge or mess should be returned to appropriate places after use.
- No furniture should be moved unnecessarily, should there be circumstances that lead to furniture removal, all removed furniture should be put back into appropriate place after use.
- Refrain from putting your feet on the furniture or lounging about in this area
- Cash bar and/or canteen facilities are provided onboard. The payment is strictly on cash basis, otherwise the bills should be settled prior to ship arriving at the next port.
- The Operation Centre/Bridge/Wheelhouse is out of bounds unless sanctioned by the personnel on duty or by prior arrangement through the Chief Scientist or Officer-of-the-watch. This applies to other work areas too e.g. the engine room, sonar compartment etc,
- There is a “Defect Book” at the Operation Centre/Bridge/Wheelhouse, kindly make note of any breakages or missing items from work areas or accommodation in this book, this is the best way to alert the officers of any defects.
- Laundry – the laundry will be open twice a week unless otherwise indicated. Do not wash small loads, if necessary combine with someone in an effort to save fresh water.
- Laboratories and work areas are to be kept clean and hygienic by the personnel/users and will be regularly inspected by the Captain in conjunction with Chief Scientist / Cruise Leader weekly.
- Night blinds must be closed at nightfall, this is a bid to minimize the bird strikes and the related maritime safety regulations.
- Music must be kept at a tolerable level in the lounge, gym and cabins as there may be personnel on duty.
- NO movies or loud music during meal times
- Duty mess is to be kept tidy at all times. Any used crockery, dishware and cutlery is to be stacked in the sink.
- The ship’s crew and the personnel should maintain the highest professional conduct during the voyage.

M-G.



Reference:

Interaction between the crew and the personnel is to be kept and maintained at the professional level. Personnel are advised to refrain from using the crew's duty mess as a thoroughfare to and from the laboratories and/or entertainment area.

- The Ship Management company has a strict alcohol use policy to which all their employees (crew) must abide by. Workplace – the ship is a place of work and personnel onboard are expected to conduct themselves in an appropriate manner.
- The Chief Scientist and/or the Captain have the right to discipline any offending members of the scientific team. Should this result in you being taken ashore due to misconduct all costs involved would be the responsibility of the offending personnel.
- The research ships are an integral component to the National research and monitoring investment in understanding of oceanic and coastal dynamics and functioning. Below are relevant guidelines aimed at promoting of healthy and safe working environment. All participants are required to follow safety orders and must note that:
 - Computers onboard are work tools and are under no circumstances to be tampered with. In case of malfunction, contact the Electronic Technician or the Captain.
 - Every cabin, including the entertainment/lounge areas is equipped with a detailed copy of "Code of Conduct" booklet from which these summarized guidelines were extracted. All personnel onboard are encouraged to read and familiarize themselves with the guidelines. If there is any uncertainty, please ask for advice from the Captain or Officer-in-Charge.
 - For safety and fire drills – personnel are expected to check the muster list and where the lifejacket is placed as soon as they board the vessel. Furthermore, personnel are to familiarize themselves with the emergency exits and stations.
 - Safety drills are mandatory and will be called during the voyage at appropriate times and not to interfere with normal operations to ensure full participation and cooperation of personnel onboard.
 - Valuables – personnel should keep their valuable items (jewellery, electronics, clothes, etc) safely as the ship crew will not be held responsible for lost items.

M-G.