ASCLME TRAINING PROGRAMME (JUNE – JULY 2008) REPORT

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1. ASCLME Training Project Purpose and Background

An integral component of the ASCLME project involves training and capacity building. The training course provides an introduction on the basic principles, concepts, methods and technologies applied in collection of near-shore oceanographic and biological data. The training course was extremely well structured offering trainees an excellent grounding in theoretical "classroom" oceanography followed by hands-on training in data collection, analysis and survey planning. All 10 trainees performed extremely well throughout the course.

2. Week 1: Lecture Series

The intense but varied programme proved to be successful. However topics such as fisheries management and EAF's etc should be given more time and possibly involve computer-modelling practicals (ECOSYM & ECOPATH). The biological content of the programme was also very limited; the only topics covered were phytoplankton taxonomy, fisheries management, EAF's, and some fish identification (MCM). Perhaps for the next training programme, this component could be expanded. This was expressed by the trainees as well. Below is an expansion of only the ocean tools and remote sensing lectures and practicals.

2.1 Ocean Tools

The objective of the Ocean Tools series of lectures was to provide the ASCLME trainees with an understanding of analytical skills in ocean data analysis and manipulation.

This lecture series was divided into three components:

1. Introduction to data acquisition techniques

1.1 Tools of the trade – an overview of oceanographic equipment.
1.2 Data acquisition software – advantages and limitations.
1.3 Ensuring data quality – Calibration, filtering, aligning and bin averaging data processes.

2. Introduction to Ocean Data View

2.1 Getting started
2.2 What data can be used and the necessary formats.
2.3 Data availability.
2.4 Import/export functions and troubleshooting.

3. Data analysis

3.1 Visual displays of hydrographic data.
3.2 Exercises using WOCE, drifter, float, current meter data, ADCP.
3.3 Exercise in interpreting regional ocean processes from select hydrographic datasets.

This was very much a “hands on” lecture series. The mornings were taken up with lectures on marine instrumentation, the need to design and implement regional observing systems, the problems concerning post-cruise data processing as well as advantages and limitations for each instrument. Trainees were then given time to design a simple cruise plan based on the equipment known to them.

A second component of the lecture series was for the trainees to familiarise themselves with Ocean Data View and using data collected during the WOCE era draw a number of oceanographic plots such as TS profiles, scatter plots, cruise maps, vertical sections etc..
The trainees were given a number of exercises in which a two WOCE surveys had to be drawn up and analysed.

2.2 Remote Sensing

The objective of the remote sensing lectures was designed to compliment the Ocean Tools module. The module provided a brief introduction in the principles and applications of satellite marine remote sensing. It is aimed at providing marine scientists of varying backgrounds with the necessary tools to incorporate satellite oceanography products in the planning and execution of a marine research expedition.

The module consisted of three components:

1. Fundamentals of satellite oceanography
2. A practical introduction to image analysis and image processing using the Bilko software package.
3. Shipboard analysis and interpretation of near-real time satellite data to facilitate *in situ* sampling strategy.

The initial theory and practical lectures was spread over two days. Each morning comprised of two hour theory sessions followed by three hour practicals in the afternoon.

1. ***Theory component: Fundamentals of satellite oceanography:***
    a. A brief history…
    b. Earth observation, the big picture…
    c. Definition of Remote Sensing
    d. Breakdown of the remote sensing process
    e. Oceanographic satellite data resources
    f. Some applications of remote sensing products

2. ***Lab component: Image analysis and feature interpretation with Bilko***
    a. Brief introduction to satellite imagery and image analysis techniques: loading different file formats, histograms, stretches, palettes, image rectification, scattergrams, formulae, filters…
    b. Investigating the Benguela Upwelling System with MODIS and Envisat ocean colour and sea surface temperature data.

3. ***Planning and execution of research project:***

a. Shipboard training aboard the *RV Fridtjof Nansen* and write up of the cruise data and complimentary remote sensing analysis – An oceanographic feature such as an Agulhas Current filament identified prior to the cruise from remote sensing will be surveyed during the time available.

As a bonus the group attended a 3rd year honours activity entitled the "World Challenge Game". The game was designed by researchers at Teele University (United Kingdom). The main aim of the activity is get students to proactively develop and implement means and mechanisms of dealing with global change. The trainees thoroughly enjoyed the activity. Finally all trainees were given two take home cd's, one containing all the lectures and PowerPoint presentations of all the lectures and one with all the outputs and exercises of the ODV and Bilko programmes.

3. WEEK 2: SHIP-BASED - ST HELENA BAY MONITORING LINE

The aim of this component, following a week of lectures, was for the trainees to gain a practical level of knowledge in acquiring and processing of hydrographic and biological data. A 3 day cruise onboard the F.R.S. Africana was planned. The aim of the cruise was to overlap the training of the ASCLME trainees with a current monitoring project in St Helena Bay. The aim of this project is

1) To regularly monitor the general oceanography and plankton in St Helena Bay.
2) To collect phytoplankton, microzooplankton and mesozooplankton on a transect starting off Elands Bay in 30m of water and finishing in a depth of 1000m.
3) To collect data on temperature, salinity, dissolved oxygen and fluorescence with the Seabird CTD
4) To collect predatory fish stomach contents to determine the presence of pre-recruit forage fish.
5) To demonstrate Acoustic identification of pelagic species and the collection of high resolution multi-frequency data for species identification. Possibly midwater trawl on a target.
6) To demonstrate bottom trawl gear and trawling operations.
7) To demonstrate fish identification and general biology.

During this cruise the students received the following practical training:

- Pre-station checks – trainees were shown how to get the CTD ready, cock all Niskin bottles and ensure that all valves were closed.

- Log keeping – trainees had to make sure that a correct log, recording station position, time and date, sounding and atmospheric conditions, was kept for each station.

- CTD acquisition software – following CTD deployment, trainees were given the task of overseeing the acquisition software, ensuring that all 12 bottles were closed at pre-determined depths, communicating with both the winch operator and bridge. Once back on deck, samples for dissolved oxygen and plankton analysis were taken by each trainee from the rosette and analysed.

- Post-station processing – CTD processing software allows the operator to clean up and filter the CTD data. Following the cast, steps were taken by the trainees to process the data into an ODV format. To achieve this, the data had to first be averaged into single 1 m bins, converted from binary to ascii format, any spikes removed and to compensate for the pitch and roll of the ship during the deployment.

Throughout the previous week the trainees received lectures on oceanographic instrumentation and the steps necessary to take to (a) collect the data and (b) process into an ODV format. Participation in this cruise enabled each trainee to put into practice the information learnt the previous week. Unfortunately, gale force winds and swell > 5 m resulted in the survey being cancelled and only 4 stations and a single mid-water trawl were occupied.

4. WEEK 3: FALSE BAY FIELD TRIP

A 5 day False Bay boat based field trip was organised as a follow on from the cruise. The ASCLME office had bought a YSI handheld CTD/data logger and the aim of this week was for the trainees to gain experience in boat-based work using this new instrument.

Trainees were divided into 2 groups.

Day 1 and 2 - Trainees spent each day getting hands on experience in operating the YSI CTD and carrying out net tows in the lee of Smitswinkel Bay. During this period, each group were trained in the correct procedures of lowering a CTD by hand, the optimal rate at which the CTD should be lowered, the correct procedure in keeping a station logbook, as well as down loading the data from the data logger into the Ecowatch software. In addition, at each CTD cast the trainees, under the guidance of Pierre Malan, operated both a vertical and horizontal net trawl and analysed phytoplankton obtained during each cast.

Day 3 and 4 – Trainees spent each day collecting CTD and BONGO data along the Simons Town - Rooiels monitoring line, which is occupied by IMT. The large opening of False Bay exposes the basin to external influences such as sub-tidal sea level fluctuation and current reversals that occur in the SE Atlantic Ocean. Previous studies have produced sufficient data to investigate the occurrence of remote wind forcing but insufficient data exists on the exact response of this bay to this remote forcing. This line comprises of a total of 9 CTD stations across the mouth of False Bay and aims to better understand the combined role physical processes such as tides, wave activity, variation in wind direction and strength have on the general circulation of the Bay. In doing so, IMT hope to establish the role seasonality and in particular changes in wind stress between Summer and Winter months have on the circulation path within the bay.

As part of the training cruise, a total of 7 CTDs and net trawls to a maximum depth of 70 m were deployed each day across the mouth of False Bay.

Day 5 - This was the final boat day and each group was given an exercise to map the freshwater influx of the Elsies River into Glencairn Bay. Trainees were given a free reign to plan a suitable survey grid that would establish the extent and character of the fresh/brackish water plume extending into the bay. The trainees were encouraged to work as a team in their survey work. At each survey between 8 and 11 CTDs were deployed within the Bay area, surface oxygen samples were collected and fixed at each station and 2 net tows were conducted across the river mouth. The following week was given to writing up the data into a research report - see accompanying reports.

5. EQUIPMENT RECOMMENDATIONS

YSI CTD 600 XLM – This is an extremely simple CTD to use. The basic handheld interface shows changes in temperature and salinity as the cast is underway. The necessary commands to activate and deactivate the data logger, save or download data are extremely user-friendly resembling a cell-phone styled touchpad. The YSI software "Ecowatch" is very user friendly and none of the trainees experienced any problems in learning this quickly. Once the data had been downloaded the trainees then plotted and analysed the data in ODV.

Ocean Data View (ODV) - Ocean Data View, is a multiple-variable graphical analysis and display package for oceanographic station data (station metadata, temperature, salinity, nutrients, others), compatible with several commonly used international marine data formats. Station charts, station data profiles, multi-variable scatter plats, section profiles, and surface plots can be created easily within a user-specified physical layout. Plotted data is easily gridded and/or contoured in nearly all views. This is an extremely simple programme to learn and the trainees had absolutely no problems in getting to grips with the import of the data they had collected during the boat survey. A major advantage of this software is that it is free to all institutes and can be easily downloaded off the web.

Nets – Again no difficulty was encountered during each deployment.

Oxygen Titrations – Dissolved oxygen samples were collected on the last day. Each sample was "fixed" and analysed back in the Oceanography lab.

6. CONCERNS

The ASCLME office needs to establish, prior to the training course, the nature of boat-based work for each country and to develop an oceanographic "toolbox" in line with their needs. We have drawn up an equipment "wish-list" that should be purchased prior to the next training programme.

In addition, the YSI CTD, although a very simple device to use, houses only the minimum sensors i.e. temperature, depth and Salinity. Should the countries and their institutes be interested in pollution studies, estuarine or mangrove research/monitoring, turbidity or productivity studies then it is essential that more sensors are available to the trainees. Additional sensors that should be included in the package are dissolved oxygen and turbidity.

The connection between the CTD interface and the PC is an old com1 port. Most modern laptops do not have an available com1 port having been replaced by a USB. To ensure that the data can be downloaded from the CTD I would strongly recommend that each CTD package come with a Com1-USB converter – I would imagine such a cable would be difficult to purchase in some African countries.

7. EQUIPMENT SUGGESTIONS

Pierre Malan and I have put together a wish list that the ASCLME office should consider for future training programmes.

Plankton

- Plankton nets - The best would probably be a mini bongo with a 200micron mesh. This could be hauled vertically or obliquely using a hand winch. A surface drift net which could be deployed over the side of a small boat.
- A hand winch with about 200 meters of 5mm wire. Should be able to be mounted on a small boat, probably clamped to the rail.
- A "backpack" water tank of the type used by firefighters. This could provide water pressure for washing down plankton nets.
- Squeeze bottles for formalin
- Sample containers – best would be 350 ml screw top jars.
- Waterproof paper labels
- A plankton concentrator, best made of PVC pipe with plankton net glued over one end.
- Spare plankton netting of the same mesh as the nets.
- A small secchi disc for light studies

Oxygen

- 1 to 5 ml disposable syringes for dispensing $MnCl_2$ and NaOH+KI
- Winkler equipment including a self zeroing burette, chemical containers, including a container with a pressure bulb for pumping reagent into the burette.
- A reagent box set – dealing with reagents on a rocking boat is difficult and requires a number of hands to prevent the bottles from spilling and breaking. A box with the reagents bottles strapped that can be clamped onto the side of the boat would be ideal for this work.
- Small Niskin bottle and rope of up to 50 m.
- Rope markers
- Spare messengers
- Oxygen tubes
- Small digital thermometer
- Spare plastic bottles

Temperature

- A Crawford Bucket
- Spyglass

General

- Assorted buckets
- Waterproof bins for packing equipment
- An echo-sounder that can be mounted on a small boat. Battery operated with a transducer that can, if necessary, be put overboard on a pole.
- GPS
- Solar battery charger for GPS and echo-sounder batteries.

8. REPORT ON LOGISTICS AND ADMINISTRATIVE ARRANGEMENTS

While the course did run smoothly, it was very hurried due to the tight time-frame. Given the bureaucracy at the university, budget and contract approval does need some lee-time. The short-time frame also impacted on flight prices and other costs as well as the use of university accommodation. Therefore planning future training courses must take the time-factor into consideration.

Furthermore, given that it is ideal to schedule the training in winter (no south-easterly winds), particularly for boat-based training, the winter rains prove very unfriendly for most trainees. A recommendation would be to run the training between April and June. While there are some winds during this period, it is not very strong or consistent and may prove to be a better time. On the positive and fortuitous side, scheduling the training to overlap with the SAMSS symposium was wonderful in that it provided trainees with the perfect opportunity of meeting and networking with various marine researchers from around southern Africa. From the report submitted, the trainees definitely got a bird-eye view of what research is currently being conducted.

Overall the trainees seemed satisfied with the arrangements and the course was well-received. From the feedback by the lecturers and trainers, all the trainees performed very well and were eager to learn and participate. The group developed a good repertoire and worked well as a team – this was particularly helpful when doing group projects on the boat based work.

9. ACKNOWLEDGEMENTS

Carl Wainman and the IMT for the use of the SeaLab Vessel
UCT – Zoology Dept – use of their vehicle & lecture room
SAMSS organisers, & all the trainers & lecturers
Helen Wooton & Cristina Cicognani (ASCLME), Helen King & Emlyn Balarin (MA-RE)

10. ANNEX 1 – Programme

MA-RE Institute – ASCLME Oceanographic Training Course & Cruise

23 June – 16th July 2008
Venue: Zoology Building – Seminar Room 1

Course Component:

Day 1: (*23 June)*
Introductory lectures

8:15 – 8:30
Welcome and Introductions

8:30 – 9:25
Frank Shillington

- Insights gained from the BCLME activities
- Oceanographic sampling strategies - E.g. aliasing, synoptic coverage etc
- An introduction to geostrophy

Suggested reading: Emery, W.J., Thomson, R.E., 1998. Data analysis in physical oceanography. Pergamon, Elsevier, Oxford, 634pp

9:30 – 10:25
Johann Lutjeharms

- The Greater Agulhas Current System

10:30 – 10:45
Tea & Coffee

10:45 – 13:00
Mike Lucas

- Phytoplankton taxonomy, biomass and productivity

13:00 -14:00
Lunch

14:00 - 15:00
George Philander

- Global Climate Change & How to build a habitable planet

15:00 - 16:30
Howard Waldron

- Dissolved oxygen titration in the Lab

- Brief overview of the Train-Sea-Coast Programme

Day 2 & 3 *(24-25 June)*

9:00 – 13:00
Isabelle Ansorge

- Introduction to techniques in which hydrographic data is acquired and quality assured.
- Introduction to Ocean Data View and the analysis of hydrographic data.

14:00 – 16:00

- Learning and Working with Ocean Data View (Computer Lab)

Day 4 & 5 *(26-27 June)*

26th June

9:00 – 10:00
Warwick Sauer

- Fisheries Management

10:00 – 10:15
Tea

10:15 – 13:00
Christo Whittle

- Introduction to marine remote sensing

13:00 – 14:00
Lunch

14:00 – 16:00

- Introduction to marine remote sensing (Computer labs)

27th June

9:00 – 10:00
Johann Augustyn

- Ecosystem Approach to Fisheries

10:00 – 10:15
Tea

10:15 – 13:00
Christo Whittle

- Introduction to marine remote sensing *(contd.)*

13:00 – 14:00
Lunch

14:00 – 16:00
- Introduction to marine remote sensing (Computer labs)

Conference Component:

29 June – 3 July
SAMSS – Kramer Building – UCT Middle Campus

1 July
Afternoon- Leave UCT at 13:30
14:00 – 16:00
- Fish Identification and Biology – at Marine and Coastal Management

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Cruise & Write-up Component:

3 – 5 July
RV Africana Cruise

Sharon du Plessis
Fish Identification and biology

7 – 11 July
Boat Work – SeaLab (IMT)

Isabelle Ansorge, Pierre Malan & Christo Whittle
The aim of this component will be for students to gain a practical level of knowledge in the acquiring and processing of hydrographic data. Inshore daily trips along the Cape coast will take place. Equipment available will comprise of CTD, XBT, ADCP, surface drifters and ARGO floats. In addition, students will learn sampling and analysis techniques for dissolved oxygen, salinity, nutrients (Silicates, phosphates, nitrates and nitrites) and chlorophyll. Students will be expected to make use of their ODV training to interpret all hydrographic data collected during this survey. All these surveys will take place on the SeaLab vessel kindly being provided by the Institute for Maritime Technology (IMT).

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14 July
Field trip to Cape Point and IMT (Simon's Town)

15 – 16 July
Write Up of the cruise
Write up on SAMSS conference – Topic "What are your thoughts, opinions and insights on the SAMSS conference in relation to your training"

Deadline for submission of both the cruise report and the SAMSS report – 31 July 2008 to Pavs Pillay (Pavs.pillay@uct.ac.za)

16 July (Lunch Time)
Finger Lunch, Closing and Certificate presentation

11. ANNEX II – Trainees Reports

11.1 Seychelles

MA-RE Institute-ASCLME Oceanographic Training Course and Cruise

23rd June-16th July 2008

Barbara Hoareau
Seychelles Centre for Marine Research & Technology- Marine Parks Authority,
P. O. Box 1240, Victoria, Mahé, Seychelles

Travel details to reach Cape Town

The trip to Cape Town started with a 5hrs flight from Seychelles to Johannesburg on Sunday 22nd June 2008, followed by a 2hrs domestic flight from Jo'burg to Cape Town, arriving at the airport at 6.10 pm South African time. From there, we were greeted by Will, the driver who was supposed to take us to our accommodation, the Little Scotia B& B.

Welcome and catering
1. B&B

We were greeted by the receptionist at the Little Scotia at 6.30 p.m, the local time before given a tour of the guest house.

Each morning we had our breakfast at the B&B which comprises of a small buffet of assorted fruits, yogurt, bread and juice.

2. UCT

On the first day, Monday the 23rd we met with Ms Pavs Pillay, the scientific and communication liaison officer of the MA-RE institute and Mr. Frank Shillington at the Zoology building, where we had most of our lectures. They both welcomed us to Cape Town.

Afterwards, we were given our per Diem and a file containing information for the training.

We had coffee and snacks displayed at the back of the lecture room as refreshment.

Our lunch which comprises of a variety of small snacks, cheese and juice was prepared by caterers. Each day at around 1p.m we had our lunch in company of our lecturer at the Museum.

Motivation

The lectures offered an avant-gout to oceanography. They all displayed the wonders of the marine life, giving hint of how endless hydrographic data can be collected and thus welcoming us to a career in Oceanography.

All the lectures and practical enhanced our educational capability in the field of oceanography i.e. which was the key objective of the training. Our exposure to the world of oceanography increased our confidence in our field of work and also helped us in our personal advancement. Above all we received a new tool to work with.

Lectures

All the lectures were very interesting, highly motivated, informative and properly delivered. Some had much more impact on us than others given that they were first time experiences. The other common ones refreshen our knowledge on the subject and were related to our training.

1. The first lecture was a sort of introduction to the ASCLME program. As principle we learnt of the achievement of the BCLME and it correlation with the new program ASCLME. Briefly we learnt of the existence of the Agulhas current, and of its trajectory and role in the whole system.

2. **The Greater Agulhas Current System Operation**

The lecture gave a brief account of the trajectory of the Agulhas current and the different forces and processes that contributes to its existence. Through this lecture we could foresee the variation in seawater temperature, salinity, the origin and site of the upwelling process around the east coast of Africa thus increasing phytoplankton population in some areas. The knowledge we got from this lecture helped us in the analysis of the data collected in the Glencairn Bay.

3. **Phytoplankton Taxonomy, Biomass and Productivity**

The lecture was very informative and interesting though I found it a bit too brief. I do understand that as a trainee we needed to have a basic knowledge of the subject which I did but I would have loved to get an expert point of view about the matter in a bit more detail (especially on the area of Taxonomy). Though I do understand that there was some time constraint. The lecture helped me to understand better about the concept 'Biological Carbon Pump' and its possible contribution in the recovery of the planet Earth from the destructive green house effect.

4. **Global Climate Change and How to build a habitable planet.**

This lecture was really straight forward and to the point. It grasped our attention from the start and it took us on a nice ride. The innovative ideas and content of the lecture helped us to place into perspective the destructive effect man is having on the planet Earth. Especially us islanders the menace is much more fearful because we are facing a possible and immediate extinction.

5. Oxygen titration

The seminar was very informative and broad. We touched different topics such as: the transects type one can use while collecting hydrographic data, the different sampling method and the possible equipment that can be used either manual or on big ships. We even got the chance to see an oxygen titration demonstration, done by the lecturer. The latter refreshened our past knowledge of the subject and it also gave us enough ground for us to do our own titration of the sea water samples collected on the transect at the Glencairn Bay.

6. **Introduction to Ocean data view.**

Amid the lectures a greater importance was given to the above. It provided us with analytical skills necessary for us to conduct any offshore scientific operation in our own country. The content of the

lecture was essential and was the main key since it was used in most of the work done during the training. It has become a significant tool for future work done using the CTD.

7. Fisheries Management

Wonderfully delivered with jokes but touching the alarming situations of some fish stock around the world. During the lecture we were given ideas and options on how to approach the upsetting problem regarding the overexploitation of fish. We made note of some important aspect discussed since it is applicable to us islanders one of the main fish eaters around the world. The idea of the possible disappearance of fish stock might be a stab to big developing countries but to us islanders it will be a massive blow to the economy.

8. Remote sensing

This module was interesting and it complemented the ODV program. It demonstrated the interrelation and interdependence of in situ and satellite data in its attempt in providing a 3-D picture of oceanographic features. We had a chance to get to know the program Bilko and to relate to images from the satellite. We even acknowledge the possible use of Bilko in large scale marine ecosystem monitoring around the islands especially in the spacious EEZ of the country.

9. Ecosystem approach to fisheries.

This seminar was more based on strategies and management to fisheries. It related to the possible approach one has to take to enhance a better fish stock without overall dispute from the affecting party i.e. the fisherman. The ideas drive to ensure a sustainable supply of fish

for consumption and business. It was quite interesting and much related to our own research back home.

10. Fish Identification and biology

The practical was really good .We got to identify some fishes according to their scientific names in the Smiths' Sea fishes. We even refreshed our knowledge on how to determine a fish age using the otolith.

We expected to spend a bit more time at the MCM for this practical since fishes are one of our major assets. If there's need to make some changes in the program maybe more time need to be dedicated to this practical.

The cruise

The cruise on the RV Africana was done in a bad timing due to bad weather. Anyway since this program had been planned for a long while yet, I do understand that one could not have predict what the weather would have been like on the 3rd – 5th of July.

The ship sailed around 11 a.m on Thursday the 3rd of July from Quay 500.It went in the direction of the Columbine station to start sampling immediately. It then moved to Dwarskerdos an area of low oxygen concentration.

The cruise had the intention of completing the Helena Bay monitoring line and SARP line but the weather did not permit the onboard scientist to achieve their goals. Two CTD stations and a mid water trawl was performed, but most of us trainees could not assist.

Though we could not achieve the overall objectives of the trip we did manage to witness the deploying of the CTD at the CTD training station. We observed the various steps the technicians have to go through to collect data. Though we were all seasick at first with the endless rocking of the boat we did managed to enjoy ourselves a bit.

After the CTD rosette was rolled in, we took turns in collecting and fixing the oxygen samples in numbered flask. While this was a hand in experience it was really a pity that we could not see the end result given that we did not do the titration on the ship.

We observed a demonstration done by Elana Wright in the processing of the seawater samples to get the plankton. She explained that the collected samples, needs to be well conserved to be processed further at MCM. The main idea of the procedure is to detect the level of chlorophyll-a and the identification of plankton trapped in each samples collected from different depth.

On the 4th of July after collecting the data from the CTD, Dr. Ansorge did a demonstration of the 7 steps one have to go through in order to convert the raw data in the right format for its processing in the ODV.

The cruise was a nice experience for most of us since we got a hand on practice with the ship equipment. I guess we did manage to grasp some knowledge and techniques even if we lost some weight on these two days.

Normally us islanders we use only small boat or small vessel for our work. So this trip was a real treat.

Boat work

For the boat work we were divided in two groups of 5 person (On person from each country belonged to each group). Given that the Boat lab could only take one group at a time, we had to alternate working days. On the first day we went out on a safari with Mr. Emlin at Cape point. It was a nice day with a little drizzle at times. We managed to get to the old light house and we enjoyed the awesome scenery. It was really amazing.

Along the way to the Cape of Good Hope we spotted two whales quite close to the shore.

On the next the day it was our turn to be at sea. We started by getting acquainted to the CTD and we followed the instructions given by Dr.Ansorge accordingly. We went out Simon's Town to an area quite close to cape point in False Bay and we did a few test stations just to get the hang of the equipment. The weather wasn't too good at first it was quite rainy and out at sea it was really cold. Luckily the oil skin served as wind breakers and we managed to do our work with little difficulty. While we were at sea the other group was on the safari. The following Wednesday we were given a day off. Some of us decided to start the report writing while some went out.

On Thursday 10th it was the real deal. We had to do about 7 stations just like the group before us did. We worked as a team and we alternate on different duties such as; taking the GPS coordinates of the station, setting the interface, launching or deploying the CTD, Bringing the CTD to base and helping with the trawling etc.

When we got ashore we had to transfer the data collected by the CTD's interfase to the laptop. We did it on our own while Dr. Ansorge look upon to ensure that the correct procedure was followed. It was real team work.

The next day, Friday 11th, both group went down to Simons Town. While group 1 went on the boat for their half day trip in Glencairn Bay, we stayed behind and we had a nice walk in Simon's Town.

At around 1p.m it was our turn to embark the boat. This time we were given instructions so as to work like a research group with main aim in detecting the movement and dilution of the plume from the Elsie river into the Glencairn Bay.

After discussing in our group we planned a hydrographic transect with 10 stations. When we were satisfied with our plan and decision we went out to implement it. We collected the data accordingly. Samples of Oxygen were collected and fixed with Manganese (II) Chloride and Alkaline Iodide. Two trawling was performed. The first one was done from station 4 up to station 1 and the second one was done from station 10 which was the control.

SAMSS

The SAMSS a prestigious event for all sea lovers started in Durban at the Lonsdale Hotel in 1970. In 2008, celebrating its 38 anniversary it was proudly hosted by the SANCOR at the UCT Middle Campus.

The Symposium was a place for learning, since the presentation provided the audience with scientific information, possible techniques and innovative ideas on how to go about on a scientific investigation. It focused on both scientific (marine life monitoring) and social science projects (education and awareness). It had large community involvement and support as the talk was presented mostly by the scientific locals. It mainly focused on monitoring of marine life, including fish, invertebrates and corals and involved various communities in pilot studies. Most monitoring work was carried out by the locals themselves. New techniques was brought forward and latest equipments were used for the accomplishment of the work presented. Above all it was very educative.

As a whole the organisation of the event was fantastic and the work delivered was of high quality.

As a Seychellois I managed to grasp a great deal from the presentation. I got innovative ideas on how some works can be done to improve our marine management. Especially, the talks on the coastal management and MPA management was of great help. New pioneering ideas were gained on ways to achieve our main targets back home; that is to equip the locals with all the

necessary skills and knowledge to better manage and conserve our coastal resources. I should say that the SAMSS couldn't have fallen at a better time.

The presentation of Dr. George Philander and Dr. Johann Lutjeharms were very impressive and at the same time educative. It managed to indicate the level of responsibilities us human have regarding our planet and the destructive status of the planet at the moment.

During the symposium, due to the large flux of participants at the middle campus, caterers have to operate on a schedule to keep things running and everyone happy. Meal times were fixed, refreshment were always at 10.15 a.m and 15.30 p.m .Three stop station were placed with a small buffet of snacks and drinks. Packed lunches were distributed at 12.30 p.m allowing the participants to converse on the talks and asking questions where need be.

The award ceremony on Wednesday 2nd of July was hosted at the Sea Point Civic centre in Cape Town. In the ceremony we managed to get acquainted to some UCT students and we had a wonderful time.

Things we might need in the Seychelles to make good use of the ASCLME training program.

- More sensors need to be added to the CTD e.g oxygen , turbidity,

- We might need a photometer to trace the metals and nutrients. It is quite difficult to use chemicals because we do not have that much funding to buy them and to stock them in a safe place.
- Bongo nets of different sizes for trawling
- Portable eco sounder.

It will be quite difficult to use the CTD if one do not know the depth of the location and we at the MPA we do not have such equipment on any of our boat.

Acknowledgement

After the training we can say that we had good capability building and the group who helped make this training a success was really wonderful. A special thanks goes to
Ms. Pavs Pillay, who was always there for us. Whatever the problem we had during the whole 25 days she was always ready to help. She did a tremendous work.
Special thanks also goes to Dr. Ansorge for her patient and fantastic spirit and the help she gave us while doing the practical work on the boat. If I came to love oceanography I think I owe it mostly to her. Special thanks goes to all the lecturers. Thank you very much all of you for this opportunity.

THE MOVEMENT AND DILUTION OF CONTAMINATED PLUME ORIGINATING FROM THE ELSIE RIVER IN THE GLENCAIRN BAY.

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INTRODUCTION

False Bay located at 4°10´S 18° 30´ E is situated immediately south of Cape Town, the oldest and largest city in the Cape Province and the legislative capital of South Africa. It is the largest bay in South Africa covering an area of about 1000Km², an estimate made due to its roughly square shape. The mouth of the Bay faces due south into the Atlantic Ocean (S.Taljaard , 1991).

The weather in the South-Western Cape is remarkably different from other region of South Africa, thus is that of False Bay. While most of South Africa is a summer rainfall region, the

South Western Cape has a more like Mediterranean type climate with a fifty percent of its annual rainfall during the winter season.
The winter weather of the South Western Cape is branded by disturbances in the circumpolar westerly winds, resulting in a series of eastward moving depressions. This brings cool, cloudy and rainy weather from the north-west. The range of mountain of the Cape Peninsula provides a shielded protection within the Bay (Van Heerden and Hurry, 1987).

Eleven small rivers or streams (Buffels (Wes), Elsies, Silvermine, Zand , Zeekoe, Lourens, Sir Lowry's Pass, Steenbras, Rooiels and Buffel (Oos)) drain into False Bay. They all range according to their sizes from 3 to 710 Km^2 and have a combined catchment area of 1350 Km^2 (P.D. Morant, 1991).
The Elsie estuary, the second smallest river with a length of 7.5 Km and a catchment area of 17 Km^2 was originally very similar to the Buffels (Wes). Now it is a much larger fresh water wetland discharging peat-stained acid water across Glencairn Beach into the bay during the winter. The increased area of wetland of the river is due to impoundment by road embankments in the vicinity.
Most of the rivers except Zeekoe rise in the mountain of the Cape Peninsula to the west or the Hottentos-Holland to the east.

The main input of water in the False Bay is during the peak season of rainfall (winter) i.e. given that rivers are sensitive to fluvial input (P.D, Morant, 1991). As the inflow of the fresh river water in the sea increases by rainfall, the direction of its plume is visible for several reasons. River water commonly appears more brown in colour than the seawater because the river is ordinarily carrying more suspended particles such as silt and clay.
However, the plume is not just different in colour, but also a distinct line is commonly observed between the two water masses. Typically, the river water is relatively warm and, therefore, less dense than the relatively cool, seawater during winter. Water of different densities will not mix easily. Consequently, a distinct line forms where the waters of different densities meet. This boundary continues under the water as well, so the "line" is actually a surface. If researchers test the water at certain depth at the surface, the water will have the characteristics of the river water (relatively low-density, fresh water). However, if the researchers test the water further down, the water will have the characteristics of the seawater (relatively high-density, salty water). The geometry of a river plume as well as the sharpness of its boundary may vary considerably depending on a number of factors (e.g., wind, wave, and current conditions as well as the amount of material carried in suspension).

The main aim of this study was to quantitatively determine the movement and dilution of the contaminated plume originating from the Elsie river effluent in Glencairn Bay.

MATERIAL AND METHOD

Study Site

A one day cruise was programmed on Friday 11th of July (mid winter) in Glencairn Bay near the mouth of the Elsie River. It was, specially planned to study the oceanographic properties (salinity, temperature, [Oxygen]) and biological entity of the water ie.Plankton in the Glencairn

Bay .Thus far relating the results to the possible consequences of the plume coming from the named river.
Ten stations were organized in a hydrographic transect to detect the movement of the fresh water plume from the mouth of the Elsie river to the outspread of the Glencairn bay (See Fig 1).Station10 was taken as the control.

Fig.1. Map of False Bay
Dissolved oxygen samples were collected at each station near the seawater surface using a bucket and were immediately fixed with Manganese (II) Chloride and Alkaline Iodide in small numbered flasks and left aside for the precipitate to settle.

After the CTD's, two surface trawling was done using bongo nets.

1. Trawling from the last station (station 10-Control) to a point away from the transect, for 5mins at 2 knots (boat speed)
2. Trawling from Station 4 to Station 1 for 5 minutes at 2 knots (boat speed).

The plankton samples were collected and conserved in tubes with formalin. They were to be analysed later on but it was not done.
The fixed Oxygen samples were titrated using the Dissolved Oxygen titration methods from Grasshoff.

RESULTS

Dissolve Oxygen concentration at the 10 different stations.

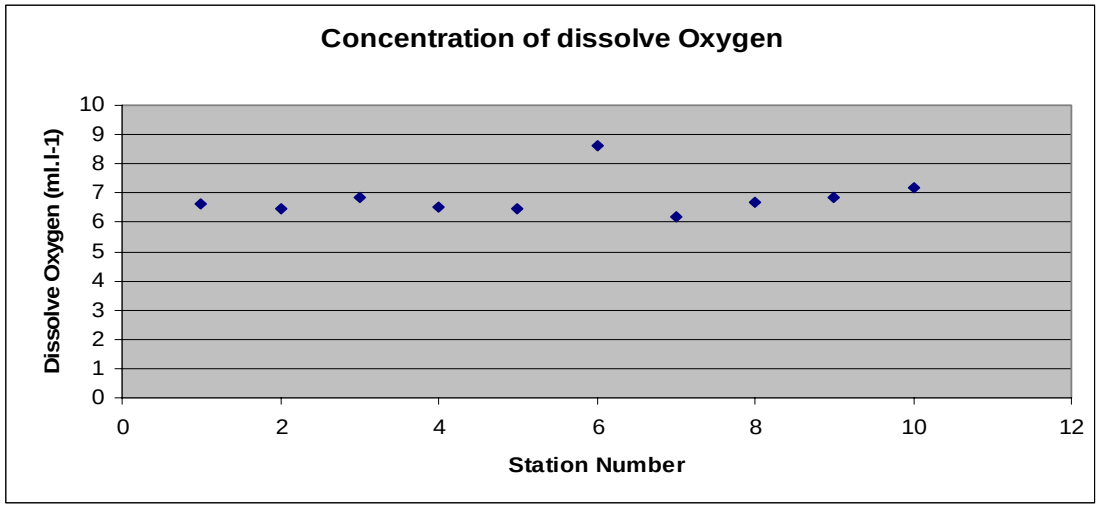


Fig 2. Dissolve Oxygen concentration of the ten stations.

Using ODV (2004) to locate and define distinctive characteristics of the data collected at Glencairn Bay.

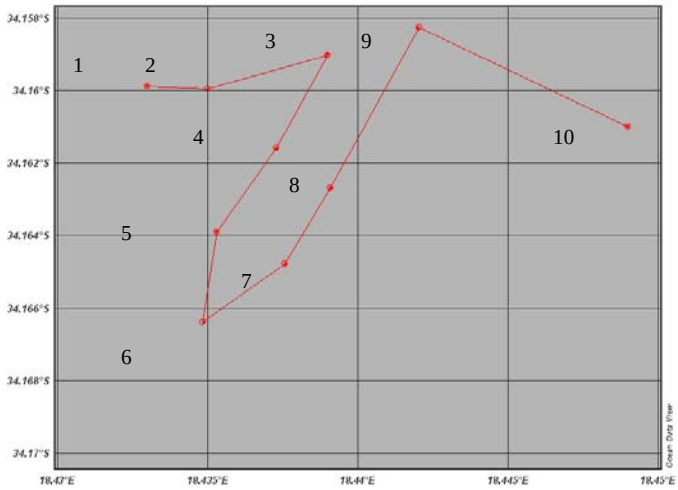
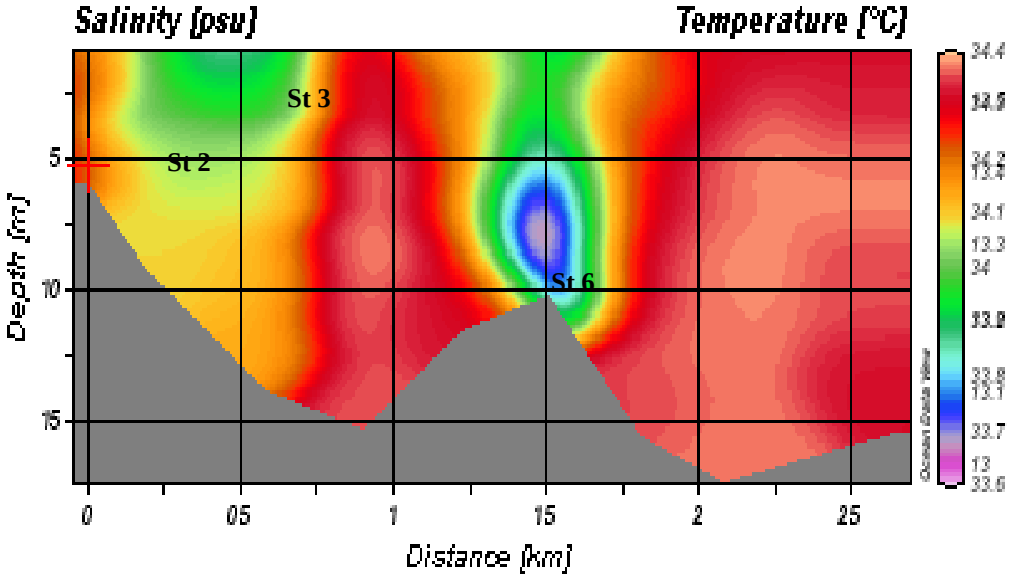


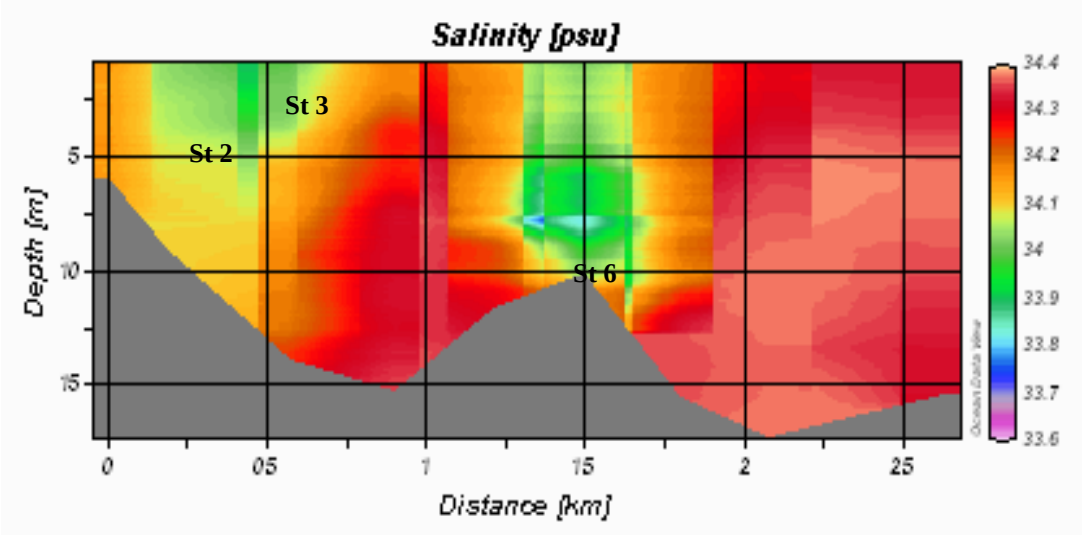
Fig 3.The hydrographic transect in the Glencairn Bay near the outflow of the Elsie river.

The data was collected from ten stations as shown in figure 2. During the making of the hydrographic transect, the research boat could not get too close to the mouth of the Elsie river. The only two stations closest to the latter was station 1 and 6.

Section Display



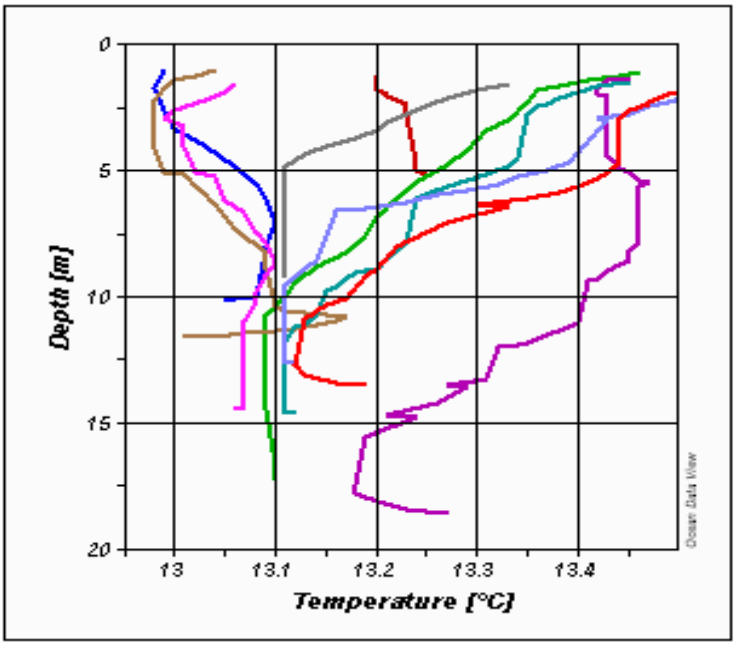
a)



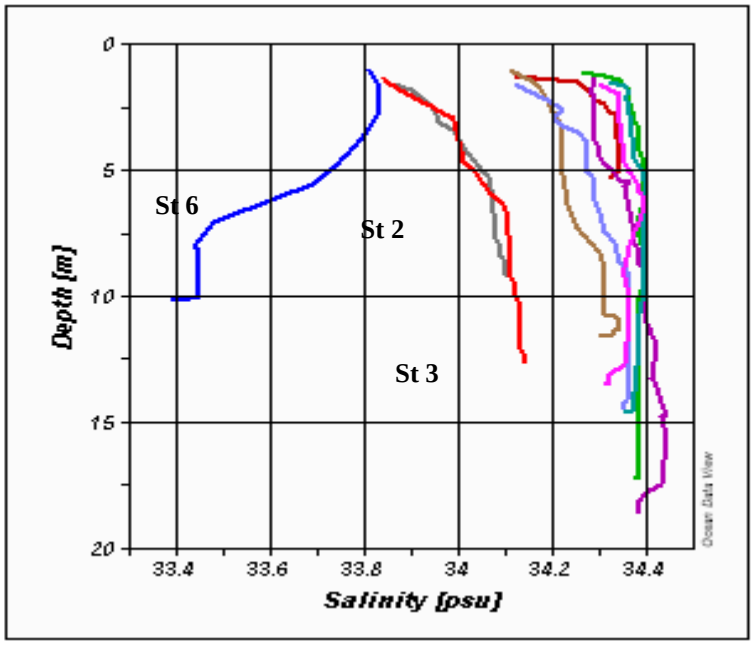
b)

Fig.4. The ten stations section a)Temperature and Salinity. b)Salinity

Station mode



i)



ii)

Fig.5 Property-property plot of the ten station i) Depth versus Temperature ii)Depth versus Salinity

Surface Mode

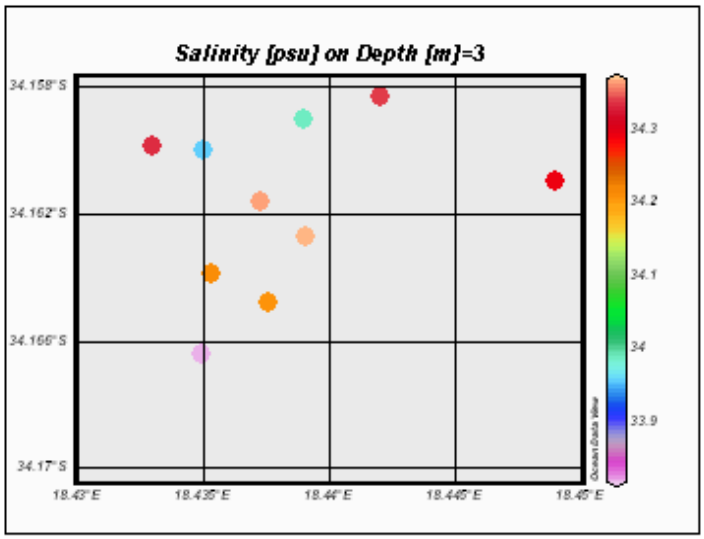


Fig 6. Salinity distribution of the ten stations on iso-surface;

Discussion

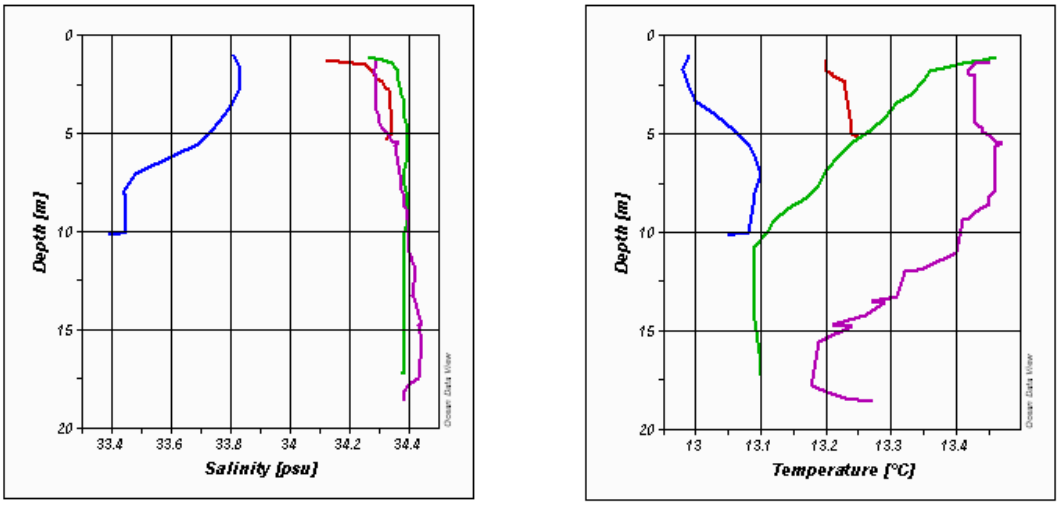
The results of the afternoon survey done at the Glencairn bay indicates that the plume of the Elsies river contributes, though in not large quantity, to a small change in some parameters of the seawater masses in the bay (See Fig. 5). The latter was found in the end results after processing the data collected close to the river mouth. The stations closest to the river as mentioned above were the station 1 and 6.

On that particular winter day (11th of July) we would have expected a larger contribution from the river attributed to the rainfall earlier during the day but unfortunately the survey was done at high tide. Thus the inflow of fresh water was rapidly mixed with the water in Bay. The seawater showed a quite high concentration of dissolved oxygen (See Fig.2) which indicates possible high level of both micro and macro organism in the marine ecosystem within the bay. The abundance of oxygen might give hints of an inflow of nutrients in the bay from the river. The increase in nutrients might have caused a boost in phytoplankton and thus a high level of dissolve oxygen in the water masses.

Four main stations were used to explain the main differences among the results. (see Fig. 7)

Station 1 (Dark brown) Station 8 (Green)

Station 6 (Blue) Station 10 (control) (Purple)



(a) (b)

Fig. 7 Property-property plot of 4 selected stations a) Depth versus Salinity b) Depth versus Temperature.

The Figure 7 indicates that, station one and six have low salinity and low temperature. Given that the two stations are found closest to the river mouth on the hydrographic transect, one might assume that the plume before being diluted and mixed with the incoming sea water due to the high tide, have certain influences on the above variables .
Stations 8 and 10 found afar from the two former stations have high salinity that increases with depth at first and then remain constant, the temperature decreases with depth, characteristics typical of normal seawater.
The illustration of the surface mode at a depth of 3m indicates the possible trajectory of the plume flowing from the river. Starting from the station 6 (See Fig.3)closest to the shore, the plume is being carried possibly by the modest current (this should be correlated to the wind direction of that particular day which was quite light only 8 knots) or the incoming tide, to the direction of the station 2 and 3 (See Fig.6).These two stations have quite low salinity in relation to the other station found akin to them and are found quite far from the shore (See Fig 4).

Conclusion

From the discussion it can be concluded that though the survey was too brief and didn't have much ground to relate to due to its simplicity, the zone of possible dilution of the river plume could be establish. If the samples of plankton collected could have been examined maybe we would have had a stronger base to our argument relating to the biological and physical/chemical status of the bay near the river. Thus not much can be said at this point and the only console will be to do more transect in this area to support our findings.

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SAMSS Conference report

Topic : "What are your thoughts, opinions and insights on the SAMSS conference in relation to your training"

Rodney A. Govinden

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The 13th Southern African Marine Science Symposium (SAMSS), continues the tri-annual SAMSS series that began in Durban in August 1970, when 54 professional South African scientists presented papers at the 'First National Oceanographic Symposium', held in the then prestigious Lonsdale Hotel. Over the intervening 38 years the conference has grown from strength to strength, and is now arguably the most important and best-attended marine meeting in the region. The symposium provides a platform for postgraduate students and scientists to present or display their research work and findings. In 2008 the Western Cape representatives of the South African Network for Coastal and Oceanic Research (SANCOR) were the proud host of the 13th SAMSS which took place in the Kramer Building at the University of Cape Town.

As part of the Agulhas Somalia Current Large Marine Ecosystem (ASCLME) oceanographic training course, the participants attending the course were registered to attend the symposium. We had the opportunity to choose which sessions to attend, depending on our own interest. As much as possible I tried to attend sessions that had some relation to the ASCLME training course and those that addressed issues and research that are of importance to me as a Fisheries Scientist.

In relation to our training, I found that some of the sessions presented research on issues that were of interest to Large Marine Ecosystem management and research, although at times it was difficult to find the link between their research and the ASCLME. Most of the research presented focused on coastal and inshore areas and raised important social and economic factors in managing these environments. Such factors can also apply to the management and conservation of offshore environments and features such as front systems and seamounts. One such presentation that addressed this issue was the presentation by Amanda Lombard entitled 'Conservation planning in spatially and temporally dynamic marine environments'. The presentation demonstrated the use of a decision support system to guide the implementation of Marine Protected Areas (MPAs) that considers the physical and biological dynamics, typical of the pelagic realm. Even thought the research was focused on the Southern Benguela ecosystem,

its concepts can be applied to the conservation of dynamic environments within the ASCLME region.

The symposium also provided an extension to different aspects of biology. Sessions such as those covering benthic diversity, fish parasites and intertidal and near shore ecology, provided information on the biology of a wide range of environments. I found the information very useful considering that topics covering aspects of biology was a bit lacking in the ASCLME training course. The series of presentations provided valuable information on the biology and interaction of different species in coastal areas of the southern African region. An understanding of the biology of the southern African region is crucial and necessary in the study of the Agulhas Large Marine Ecosystem (ALME). In addition, the fisheries stock assessment and ecosystem based fisheries management series of lectures, provided examples of different research being conducted on the stock assessment, growth, recruitment and biology of important fisheries in the southern African region. Furthermore, the series of lectures provided examples of ecosystem approaches to fisheries management and to the reduction of bycatch. Fisheries management, in particular ecosystem based approaches to fisheries management, are crucial in the management of fisheries in the ASCLME region. Studies presented during this series of lectures provided examples of how to manage fisheries that are applicable to the ASCLME region.

Furthermore, the different presentations and posters showcased different applied research in coastal and offshore environments around the southern African region. These researches provided me with different examples on how to design scientific experiments and how to analyse the data collected. Scientific design and analysis is crucial in ensuring that the results of a study is accurate and not confounded or biased. The knowledge acquired was valuable and useful when we had to design our own experiment on the last day of the boat work, to survey the influx of freshwater into False Bay coming from a small river.

Overall, the SAMSS conference was well organised and provided me with a broad understanding of different fields of research, some of which were either directly or indirectly relevant to the ALME. Some of the presentation either complimented or supplemented some of the topics that we had been learning in the ASCLME oceanographic training course. Moreover, the symposium provided us with ample opportunities to meet young scientist from the Southern African region and share our experiences and knowledge. The knowledge gathered at the symposium will also benefit me in my work and in further studies that I decide to pursue.

11.2 Mauritius

Agulhas Somali Current Large Marine Ecosystem

ASCLME

Report on

Training course on Oceanography

23 June to 16 July 2008

Vikash Munbodhe

Albion Fisheries Research Centre

Mauritius

July 2008

Overview of ASCLME Project

The Objective of the Project is to work with two other "thematic" GEF international waters projects in the area as part of a "strategic approach" to fill gaps in understanding of transboundary living resources of the two LMEs and to build capacity of the participating countries to utilize this improved understanding for more effective management by use of an ecosystem approach. This information and capacity then would be utilized by governments as part of the frameworks being established by the three projects collectively. The project is innovative in that it is being designed to complement two existing projects in the same LMEs, each with a different GEF implementating agency covering a different aspect of the same system with linkages created between them. This is being tried in these 2 LMEs for the first time to test reducing transactions costs of IA interactions. This is also the first replication of the approach taken in the Benguela Current LME project on the other side of Africa. Bilateral funding was used to build country capacity in sampling and then understanding their transboundary resources before GEF was asked to assist. The capacity was built through joint cruises and sampling to understand how their transboundary living resources worked so that information could underpin management. This project replicates that approach but utilizes GEF resources along with a ship potentially provided by Norway to slowly build country understanding to fill essential gaps on the transboundary nature of living resources and in doing so build their capacity to bring this information for fisheries/living resources management purposes.

1.1 Course Contents, 23 to 27 June 2008 (1st week)

The course contents were well established as far as concerning introduction to the Agulhas Current especially relating those research works done in the Benguela Current System. The slides presentation made the introduction interesting with a view, first to understand the upwelling system in real time data analysis as well as examining those results concerning fisheries industries in the region and also the change in the ocean dynamics in relation to local climate change. The lectures concerning introduction to oceanography highlighted almost all aspects with respect to aim and objectives of the ASCLME training course as well as raised the

participants' awareness on research and the implication of the oceanographic studies as a tool to understand the development in fisheries and also change in local and global climate.

Furthermore, the introduction to various tools and equipment such as water quality analysis, remote sensing and software for data analysis made the course more interesting as participants were allowed to use same, and get accustomed in laboratories, during field trips and in computer laboratories. Most interestingly was the design of the field trip and the exercise carried out during the field trip at Glencairn Bay where the participants were split into 2 groups and were allowed to plan, design and execute their research exercise on their own in the presence of the Lecturer. This exercise allowed the participants to utilize all the knowledge and expertise acquired during the training and also get used to the CTD and other equipment in the real environment and acquire *in-situ* hydrographic data and process it and produce report.

1.2 Southern African Marine Science Symposium, SAMSS, 29 June to 3 July 2008 (2nd week)

During SAMSS, the participants were exposed to high caliber presentations and research work. The papers presented in the conference were covered a wide range of topics such as plankton, shark, lagoon and ocean, marine pollution, marine conservation, aquaculture and many others. The papers and posters were very knowledgeable and informative in terms of research and findings, which enabled the participants to understand the various field of interest in marine science and oceanography. The conference also gave the ASCLME participants the opportunity to meet scientists from different African Institutions.

Prior to the ASCLME training course, my field of interest was mainly coastal development, water pollution, coral reef monitoring, marine conservation and marine related issues. I mainly attended those above mentioned topics during the SAMSS, but since I got lots of basic knowledge in both physical oceanography and application of satellite imagery, I also attended presentation such as *Lateral carbon export from Southern Benguala upwelling system* by Neil C. Swart,; *Warming in the Agulhas current systemsince the 80's* by Mathieu Raoult. Papers such as marine education and communication were also interesting where various aspects of

communication skills were dealt and several case studies were referred to sensitize students, public in general about marine protected areas and different sensitive issues related to the ocean and the climate change.

1.3 RV Africana Cruise 4 to 6 July 2008 (2nd Week)

Prior to the RV Africana Cruise, participants were introduced to the various equipment in the RV Africana, which were to be used for collecting hydrographic data, in situ analysis of water samples for Dissolved Oxygen and interpretation of data variability on temperature and salinity with respect to depth, fish sampling and identification during lectures. With such preparation, the field trip on RV Africana was as challengingly interesting as despite of the stormy conditions, water samples were collected effectively at two stations by the deployment of the CTD as well as fish sampling operation was carried out by deployment of mid water trawl. Water sample collected were fixed by fixing agent for further dissolved oxygen analysis at a later stage. After 2hrs of water sampling, the each participant carried out the DO analysis on-board and results were compared.

In general, the field trip on RV Africana, was a relatively good experience in terms of introduction to oceanographic research to those participants who had never been on oceanographic research expedition. The main objectives of the RV Africana cruise was accomplished as all the participants were able to understand the implication of the CTD and the essence of various software in sampling methods and collecting hydrographic data despite the unfavorable weather conditions.

1.4 Boat work 7 to 11 July 2008 (3rd week)

Prior to boat work, equipment to be used during the field trip were already introduced in lectures, such as the new model CTD for collection of hydrographic data, the bongo net for collecting plankton samples and identification under microscope.

During the first three days of the field trip, participants were physically introduced to the CTD, the software for downloading the hydrographic data, the bongo net, ways of collecting biological samples and the collection of water samples for DO analysis. Participants were allowed to use

the CTD, download data and use the software on their after few exercises under the supervision of the lecturers which allowed the participants to easily and readily learn the different techniques and *in situ* the principles required for proper data collection and sampling methodologies.

On day 4 of the boat activities, participants were split into two groups, where each groups were assigned to plan, design and execute their own sampling strategies, which was a real challenge. The site selected was the river mouth of Glencairn Bay with the objective to determine the movement of freshwater discharge and the dissipation of the freshwater contaminated plume in the Glencairn Bay. Such an exercise covered all the aspects of the aim of the ASCLME training course on Oceanography as participants were allowed to use the knowledge, equipment, software, the know-how and expertise acquired during the training.

2. Motivation, recommendation and way forward

Following the contents of the ASCLME training course on oceanography, my field of interest and my career in the marine science and oceanography, I find this training course is in line with my work as well as the type of work I always wanted to do. I acquired lots of knowledge and a lot in terms of oceanographic research work through lectures and field trip and learnt a lot from the South African Marine Science Symposium (SAMSS), especially on various field of research, which can be carried out locally to enhance development of sustainable marine resource utilization and different approach towards marine resource management and conservation.

After having attended, the ASCLME training course, I see the ocean in different ways as far as concerning research and science involved in oceanography. It is a vast subject but there is a lot to learn and understand as well as lots of information can be derived from dedicated research works. A wide range of issues related to oceanography was covered in such a limited time. The course was intense but knowledgeable, informative and consistent through which the participants can now use and implement the acquired knowledge and expertise in their respective countries to do research for sustainable use and proper management of the marine resources. Also interact and share related information with local and at regional level to better understand the shift in ocean dynamics.

3. Observations and Suggestion:

a) It should be noted that the CTD, which would be provided to the participants, is very user friendly, however it is also very sensitive to wear and tear especially the sensor, which is not properly house and secured. Thus it is suggested that along with the CTD, if possible more sensors and other parts could be made available so that in case of damage the equipment could be repaired and put to use again.

b) Given the facts that DO, pH, nitrates and phosphates are also important parameters for oceanographic studies, it is important that additional sensors, if possible, for those parameters be made available.

Report by Oocheetsing Sadasing
Introduction

Estuaries, a mixing region between river and ocean waters, are the most valuable ecosystem related to human activity. The object of our study was to determine the physical and chemical characteristics of Elsies estuary (Figure 1) after the recent downpour. The Elsies river, which drains into the estuary, has a length of 7,5 km and a elevation of 290 m above MSL.

Although listed as an estuary, this system displays few, if any, estuarine characteristics. The Elsies estuary is a freshwater wetland discharging peat-stained acid water across Glencairn Beach during the winter.

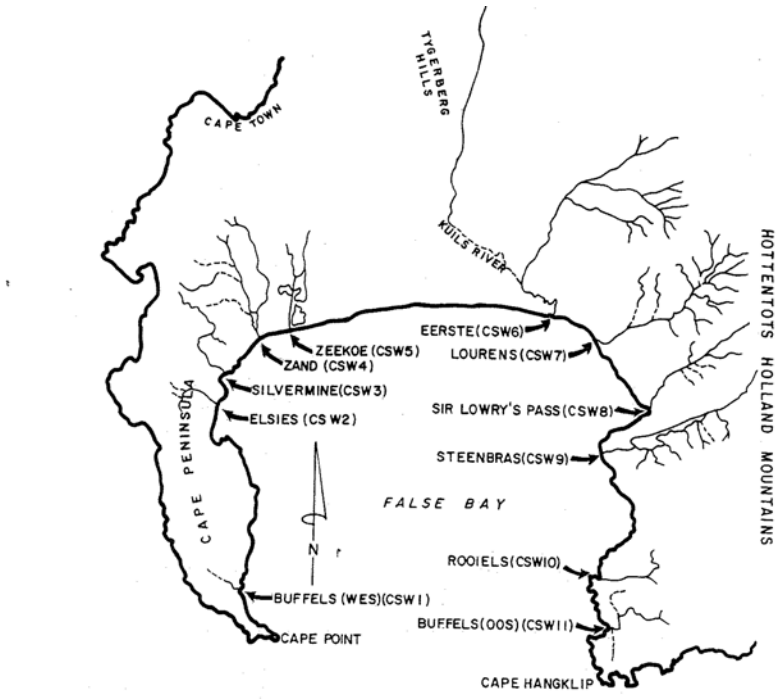


Figure 1: Location of Elsies estuary

Objectives

- Design, planning and execution of a scientific survey in the Elsies estuary
- Deployment and operation of equipment and instrumentation
- Real time acquisition and processing principles
- The importance of correct sampling techniques, real time data control and quality assurance.
- To provide participants hands-on experience with modern oceanographic observational tools as well as with data analysis techniques

Methodology

A total number of 8 sampling stations were selected in this survey. The locations of the stations are shown in Figure 2.

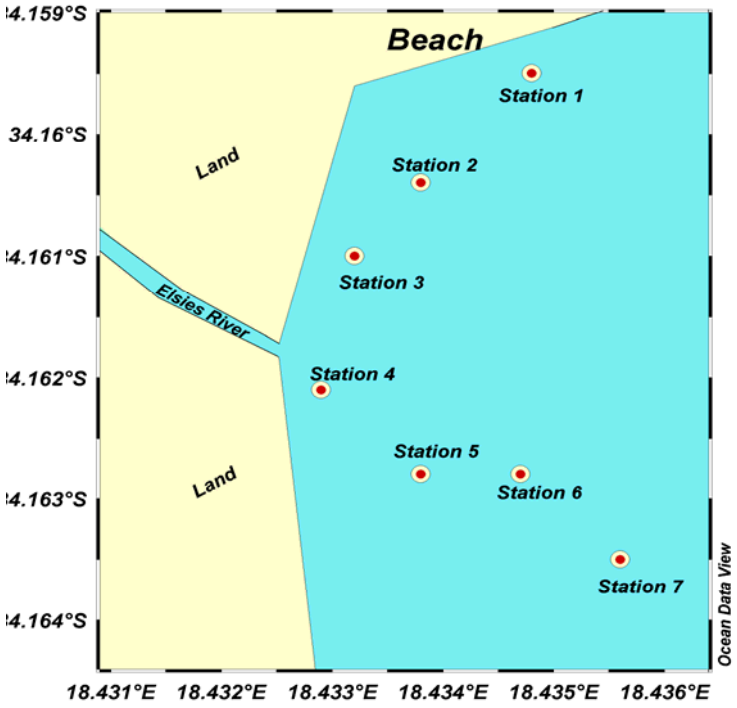


Figure 2: Location of sampling stations

Station Number	Longitude	Latitude
1	18.4348	34.1595
2	18.4338	34.1604
3	18.4332	34.1610
4	18.4329	34.1621
5	18.4338	34.1628
6	18.4347	34.1628
7	18.4356	34.1635
8	18.4367	34.1643

Sampling Objective

Obtain *in situ* measurements of temperature, salinity, depth, and dissolved oxygen in Elsies' estuary.

Sample Collection: Methods Summary

Temperature, salinity and depth were measured with a hand held YSI multi-parameter probe.

The CTD was lowered slowly through the water column, and parameter values were recorded, including a value close to the bottom.

The downloaded raw data from the CTD were analysed by Ocean Data View software. The depth profiles of salinity and temperature are presented in Figure 3, and 4 respectively.

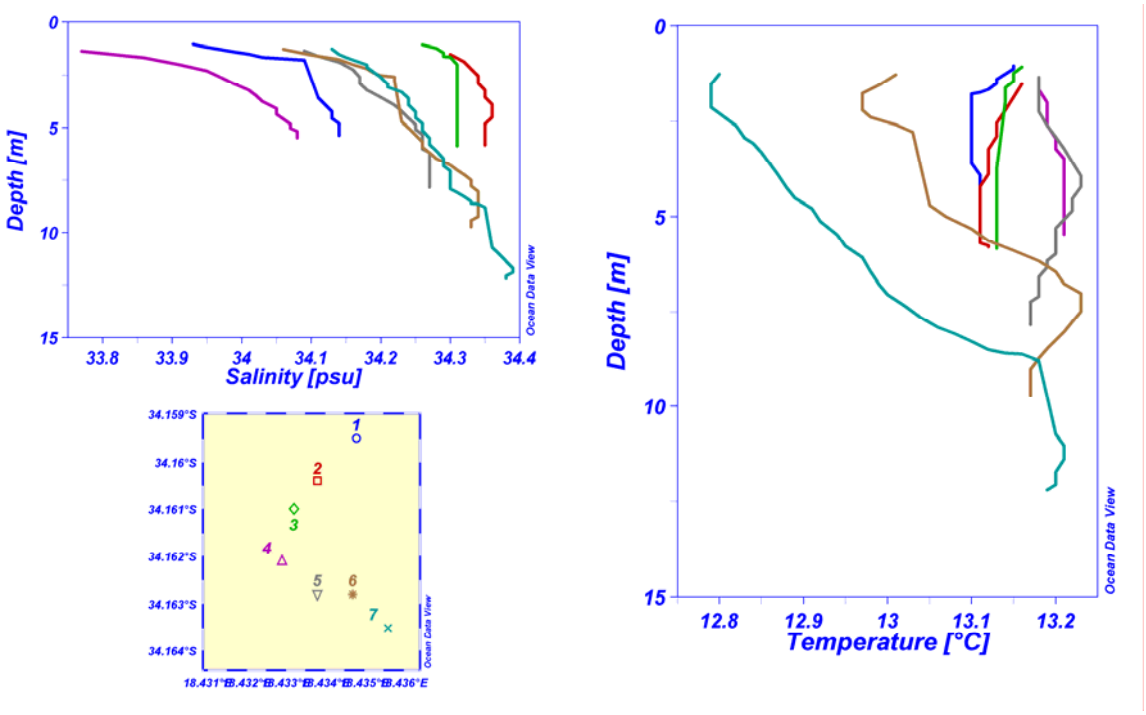
Chemical Parameter: Dissolved Oxygen

Surface water samples were collected at each of the stations for dissolved oxygen analysis. Prior to storage, 1 ml of Manganese chloride followed by 1 ml of alkaline iodide was added to the sample bottle so as to fix dissolved oxygen present in the water sample.

Principle findings

The findings are summarized below:

Figure 3: Salinity and temperature variations



The temperature in ranged from 12.8^{o}C to 13.2^{o}C (average 13C). Temperature variation in the water column was higher at the Stations 6 and 7.

The salinity in Elsies estuary ranged from 33.8 to 34.4 ppt (average 34.1 ppt). At Station 4, 5 6 and 7 the variation in salinity was higher than other stations. However, the variation at the Station 1 could not be due to freshwater flowing alongside the beach from the river mouth. Since similar changes in salinity gradient should have been noted at the stations Station 2 and 3. It may happen that there is a water discharge in this area. Further studies have to be carried out in this respect.

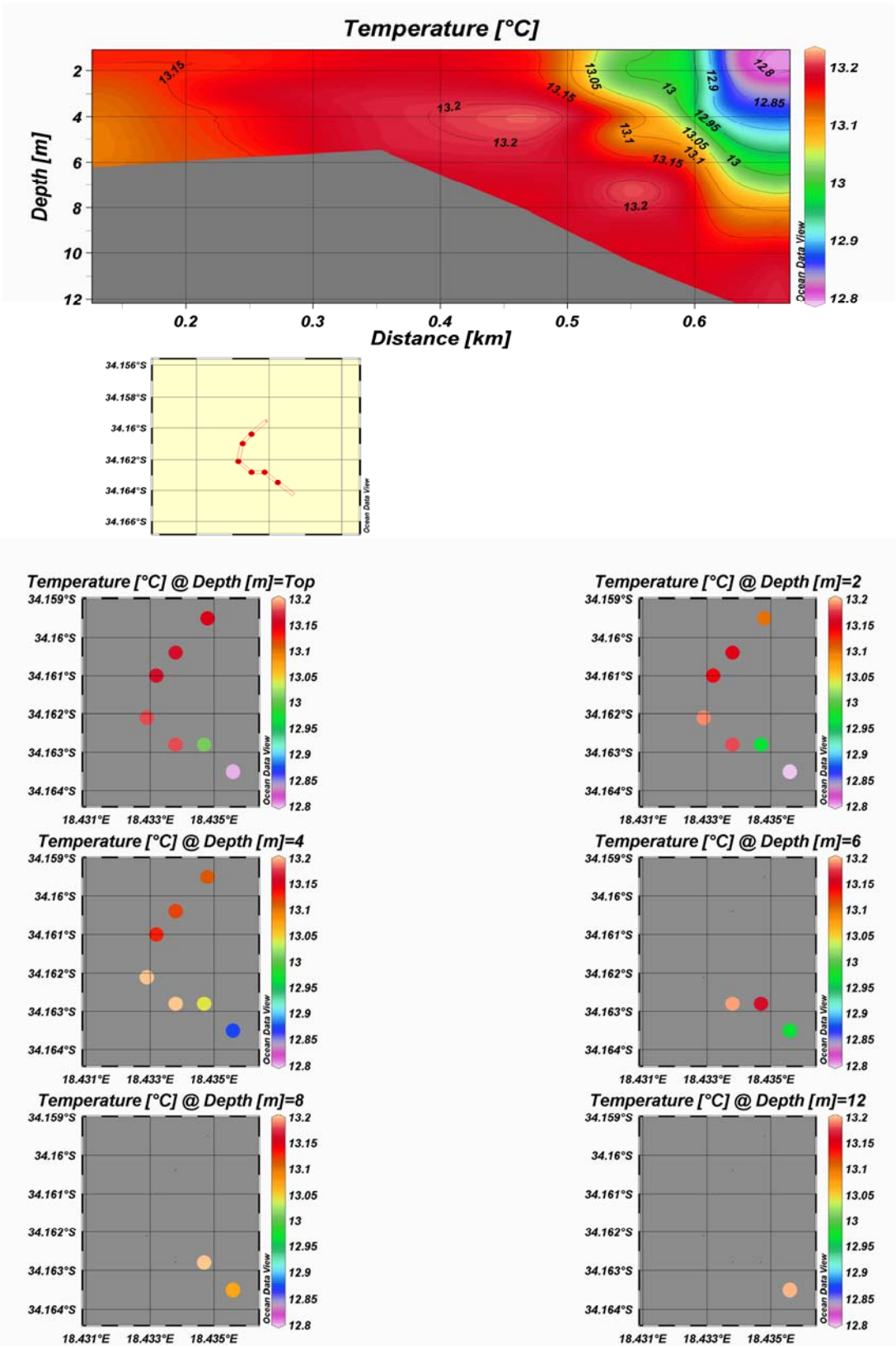
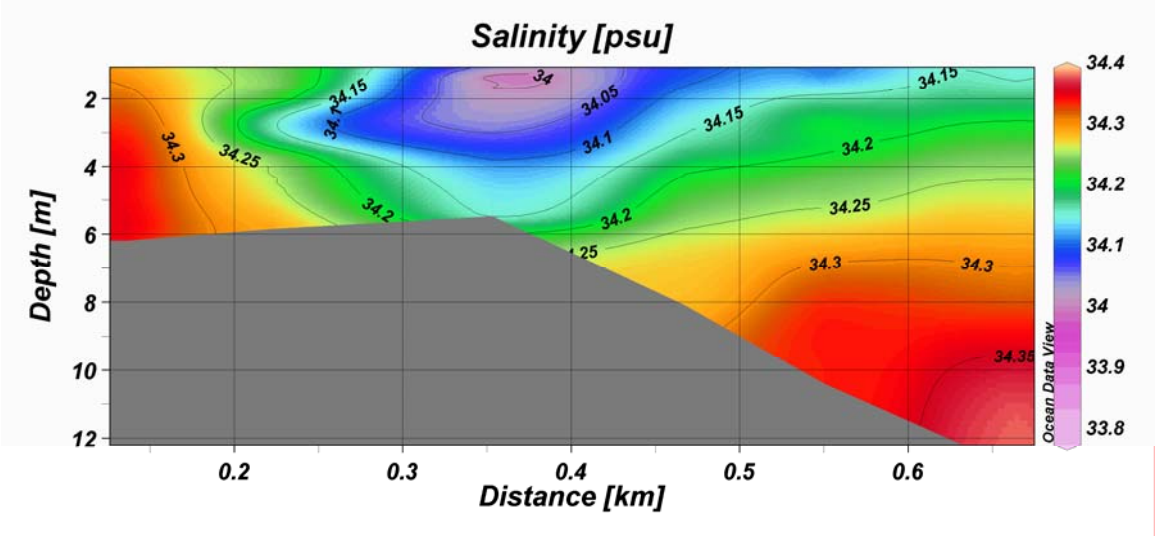


Figure 4: Temperature profiles

Owing to the shallowness in the estuary at Station 1, 2,3,4,5 there was no obvious variation of temperature throughout the water column, as shown in figure 4 temperatures plot. A significant difference water temperature was recorded at Station 6 and 7

From the salinity plot (figure 5) that it can be deduced that there is a flow of freshwater from the point of entry (Station 4) in the direction of the Station 5, 6 and 7.

The salinity distribution indicates that there was small amount of river freshwater flow in the estuary despite recent flooding and the flow is apparently restricted to a few meters below the surface.



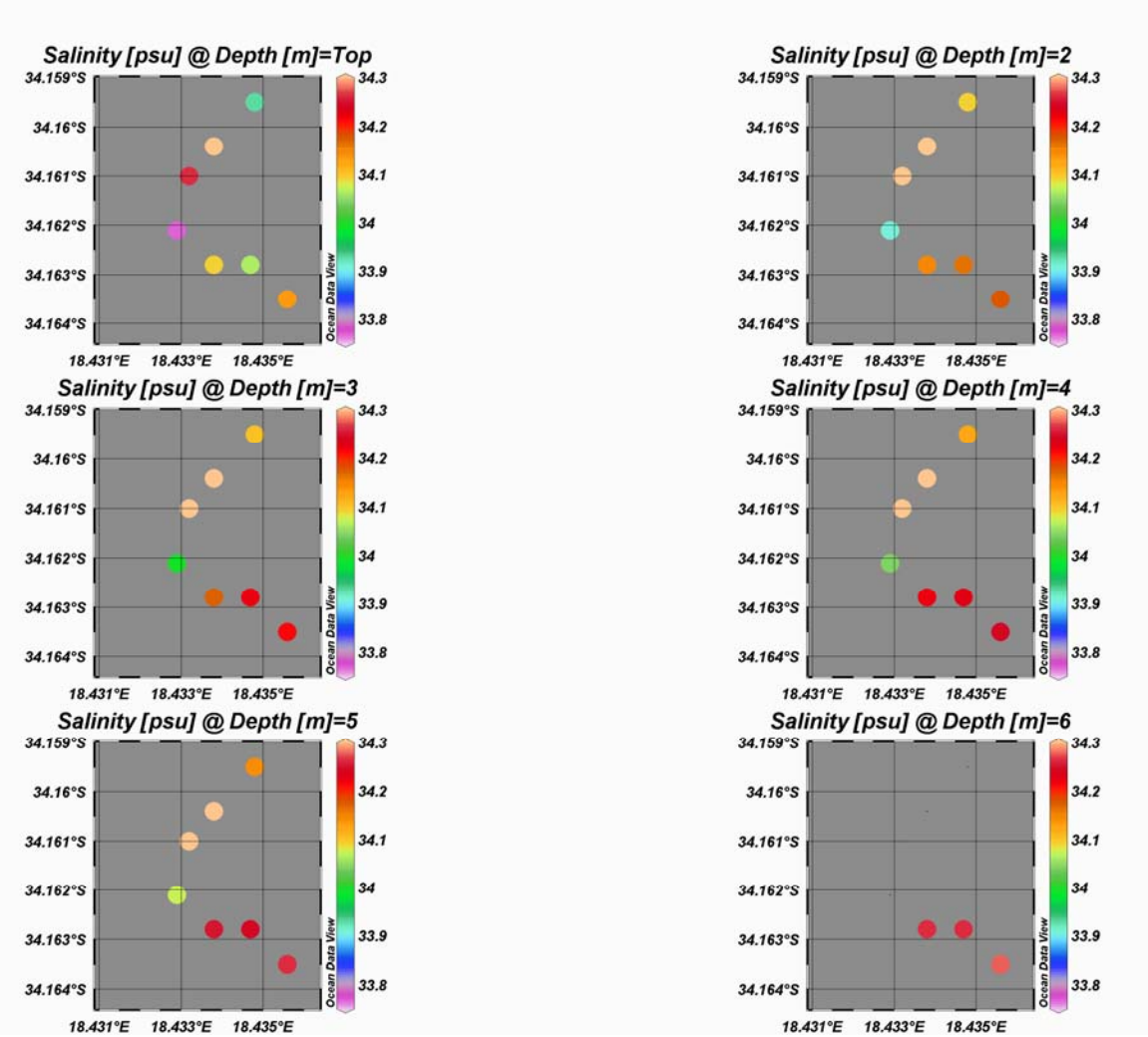


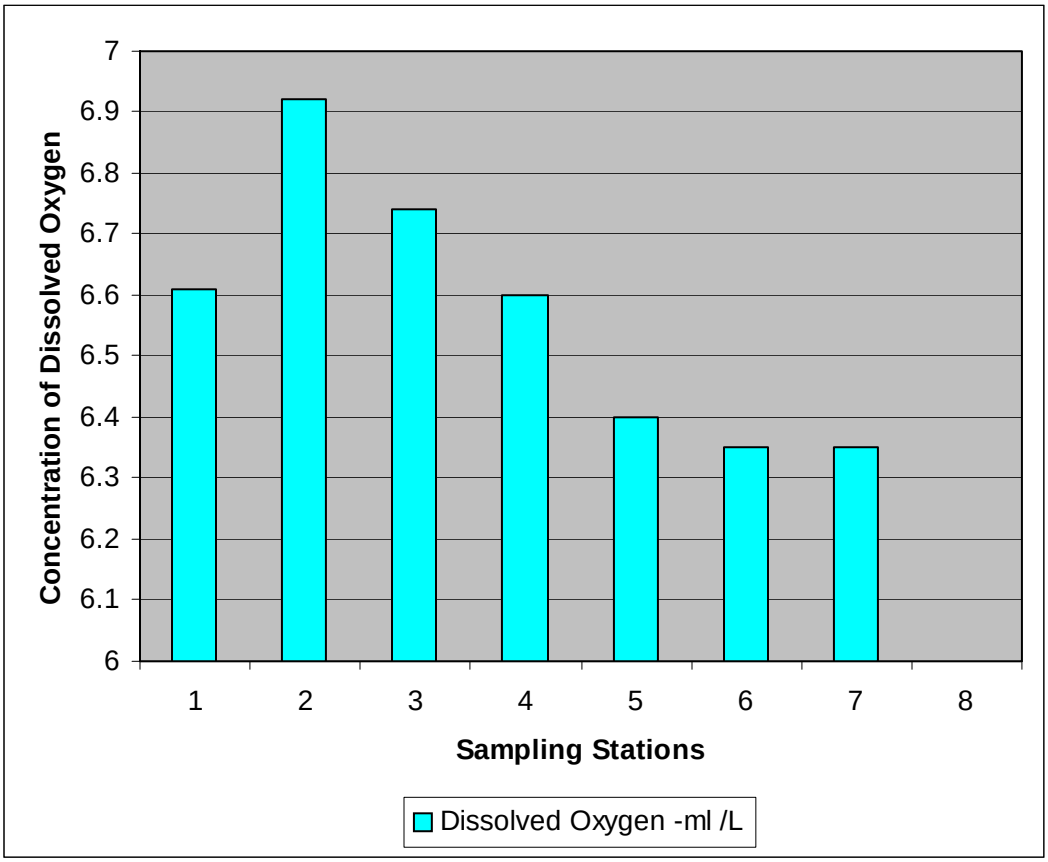
Figure 5 Salinity plot

A general conclusion can be drawn from this hydrological survey on Elsies River Estuary: this estuary does not receive an extremely heavy load of rains.

The table displays the surface dissolved oxygen concentration at each station.

Station Number	Dissolved Oxygen -ml /L
1	6.61
2	6.92
3	6.74

4	6.6
5	6.4
6	6.35
7	6.35
8	6.17



The average concentration of the dissolved oxygen is 6.5 ml per litre. This shows that the amount of dissolved oxygen present in the surface water at the sampling stations is at its optimum level.

Limitations:

1. GPS
2. Turbidity / Dissolved Oxygen/pH probing
3. Transparency monitoring device- Secchi disc
4. Current meter
5. Wave/tide recorder
6. Software not appropriate for displaying sampling stations in the False Bay

Acknowledgements
I would like to thank all the whole of ASCLME staff for their constant support and also a special thanks to Dr Isabelle Ansorge to her precious help and advice.

11.3 Madagascar

Oceanographic and Biological Training Program
By: Ratsimanarisoa Njaka

In order to prepare the ASCLME students for the planned research cruise program in August, a mini-cruise plan was organized during the second week of the training, till 03 july to 05 july 2008. The aim are to familiarize the students with the equipment used in an oceanographic vessel research. For this cruise, the specifics objectives are listed below.

1.1. Specific objectives

1. To regularly monitor the general oceanography and plankton in St Helena bay;
2. To collect phytoplankton, microzooplankton and mesozooplankton on a transect starting off Elands Bay in 30m of water and finishing in a depth of 1000m;
3. To collect data on temperature, salinity, dissolved and fluorescence with the Seabird CTD;
4. To collect predatory fish stomach contents to determine the presence of pre-recruit forage fish;
5. To demonstrate Acoustic identification of pelagic fish species and the collection of high resolution multi-frequency data for species identification;
6. To demonstrate bottom trawl gear and trawling operations; and
7. To demonstrate fish identification and general biology.

1.2. Materials and methods

1.2.1 Vessel and personnel

For this cruise, the F.R.S AFRICANA was used. It's the flagship of Sea Fisheries fleet of oceanographic research ships. Her main role is a platform for research and monitoring undertaken to guide the management of South Africa's off shore fisheries.
The scientific staff is a multidisciplinary team composed by a several specialists (acoustic, physic chemical, plankton,…). They belongs to the MCM (Marine Coastal Management) and also the UCT (University of Cape Town). This staff is managed by the Chief scientist Shaz du Plessis.

1.2.2 Area of study

St Helena Bay was choose as the area of study. This bay is characterized by a low oxygen water and on intrusions of Agulhas Bank water along the west coast.
Moreover, a long time of information already exist for this important region and one of the aim is to continue this time series to detect long term changes in the hydrology and plankton, which are important for the detection of regime shifts between dominant fish pelagic species.

1.2.3 Equipment used

To achieve these objectives, some equipment was used like:

• CTD (Conductivity-Temperature-Depth) used for the measurement temperature, salinity. It is coupled to a 12-bottle rosette sampler. Each bottle can be individually triggered to close at any depth, collecting samples that are used for chemical and biological analyses (nitrate, nitrite, phytoplankton, chlorophyll, …)
• ADCP (Acoustic Doppler Current Profiler) used to identify marine current. The ADCP will be synchronised with the fish acoustics and the surface data plotted for the entire voyage
• Mini bongo net (200 and 300µm) for the plankton study
• Trawl for demonstration of trawling operations, demersal fish identification and general biology

1.3. Constraints of the mission

Since the departure, we were confronted with a very rigorous climatic condition.
Indeed, a strong winds cumulated with intermittent rains make the sea very agitate. Some of the students have got a sea sickness.

1.4. Realized activities and results

Because of the bad weather, the initial activity planning was modified after a dialog between the ship captain and the chief scientist.

1.4.1. Trawling demonstration

A bottom trawling operations was realized on 03 July around 10h20 p.m. It's take about one hour. The capture is about twenty kilo composed especially by a small pelagic (anchovy, sardine).

1.4.2. CTD operation

Concerning the CTD, the first station was make around 05h00 a.m on 04 July. After that, a second station was operate around 3h15 p.m in the same day. I have participate in this operation.
The CTD is lowered at 90m depth. Samples was collecting on three levels depth. Each student had opportunity to prepare a bottle sampling for a later oxygen analyse. For that, the sample was diluted with 1ml of MnCl2 and 1ml of NaOH in order to precipitate the dissolved oxygen. The titration will be done at UCT.

1.4.3. Training

During the cruise, a training about preparation of sample for chlorophyll analyse was done.
For the last day, 05 July, students are trained about data extraction, data correction, data conversion and data plotting (for analyse in ODV software). The data are not accurate during the descent of the CTD. According to the scientist, accuracy of data is obtained during ascending phase compared to the first phase.

The cruise is ended at 2h30 p.m on 05 July 2008. Despite the sea sickness, this mini-cruise was profitable for us because we have learnt and acquired knowledge and experiment on scientific work undertaken in a vessel research. In fact, for a country like Madagascar, it's not so evident for a scientist to embark on a vessel to carry out their research. Thus, that was a big opportunity for us to familiarize with the life in boat as well as the use of oceanographic research equipment.

2. BOAT WORK The last week of the training was dedicated for a practical work on a small research boat named SEA LAB. The area of study was False Bay situated in South of Cape Town. It lies between 34°04' and 34°23' south latitude and 18°26' and 18°52' east longitude especially in Glencairn Bay.

2.1 Purposes Once again, the purposes of this boat work are the practice of oceanographic parameters measurement. In addition, students will learn about designing, planning and execution of scientific survey by a simulation of scientific survey in order to determine the impact of the Glencairn river in the bay.

2.2. Materials and methods The students are separated in two team for more effectiveness of the practical work. I were in the second group. About materials, we have used : - the SEA LAB boat for the study - a portable CTD for Temperature and salinity measurement - a bongo net for plankton sampling For this survey, 10 CTD stations was realised (see figure below). The station S10 is used as a pilot station because it is far from the river discharge. We suppose in this area, the river has not an impact to the sea. For the plankton study, 02 stations are done.

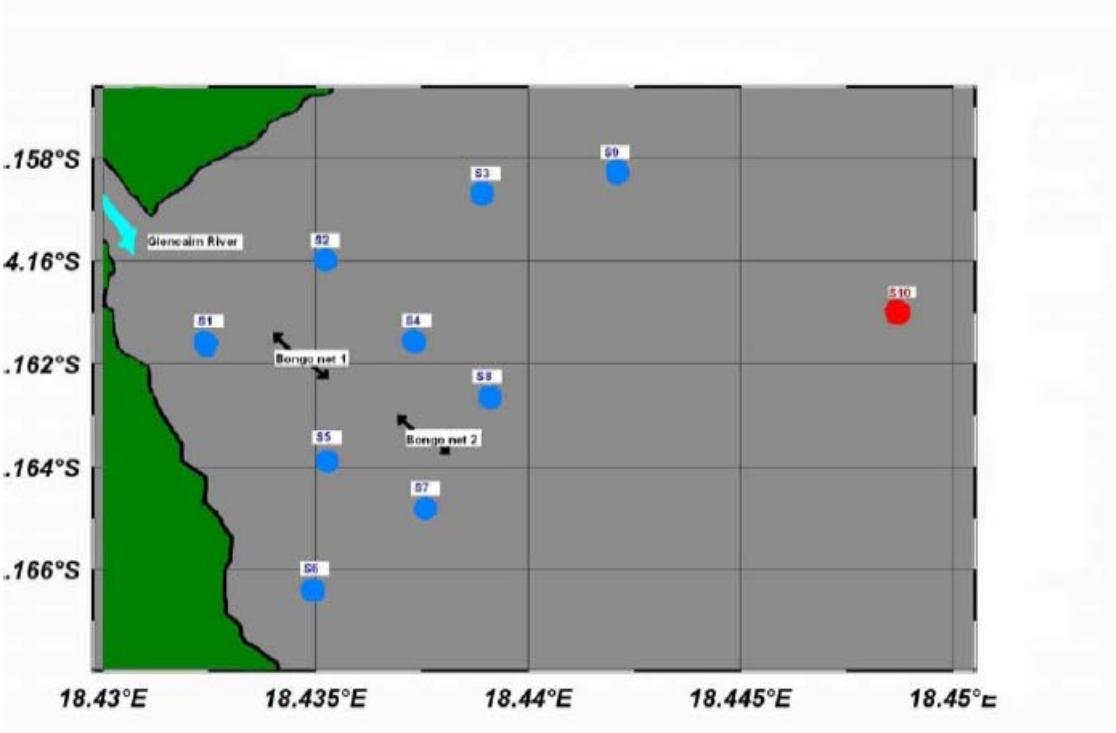


Fig. 1: Stations for CTD, Bongo net

In each station, a sampling for oxygen titration is made. Dissolved oxygen are fixed with $MnCl_2$ and NaOH. The titration will be realised at UCT laboratory.

2.3. Results

2.3.1. Temperature

About sea surface temperature, stations S1, S5, S6 and S7 have a lower temperature compared to the others stations (Fig.2). Even at 3m and 9m depth (Fig. 3 and 4), it is always confirmed. One explication is these stations are located near of the coastline/land, thus temperature exchange is more important. Moreover, it could be explained by the current of the river discharge in the sea. Perhaps, the river follow this direction arrived at sea.

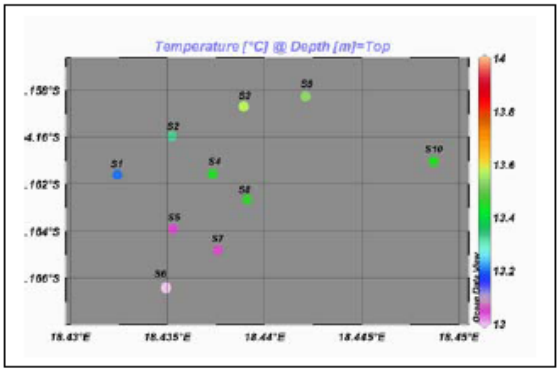


Fig.2 : Temperature in the top

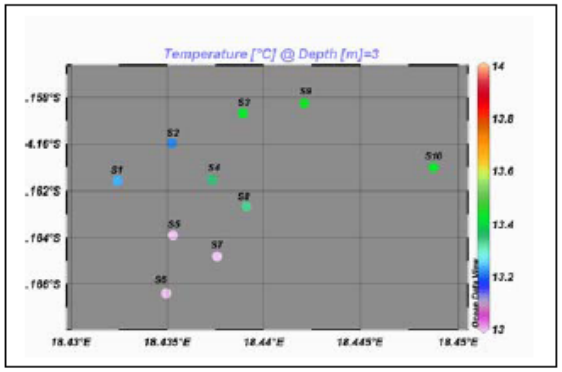


Fig.3 : Temperature at 3m depth

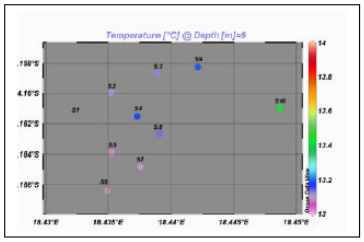


Fig.4 : Temperature at 9m depth

2.3.2. Salinity

Salinity measured during this period vary between 33.86‰ to 34,45‰. Compared with the pilot station S10, the variations of salinity are not significant. These variations are uniform in the water column (e.g in the top, at 2 and 9m depth).

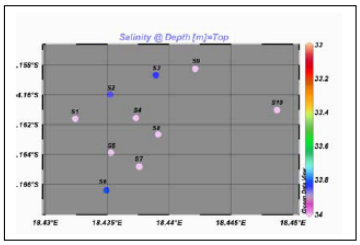


Fig.5 : Salinity in the top

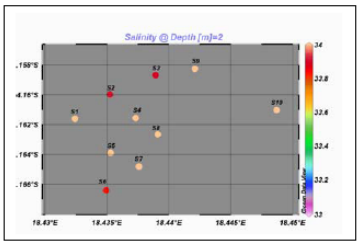


Fig.6 : Salinity at 2m depth

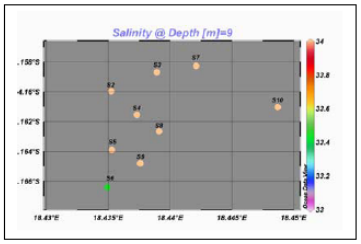


Fig.7 : Salinity at 9m depth

2.3.3. Recapitulation

The figure below show the evolution of temperature and salinity observed in the area of sampling.

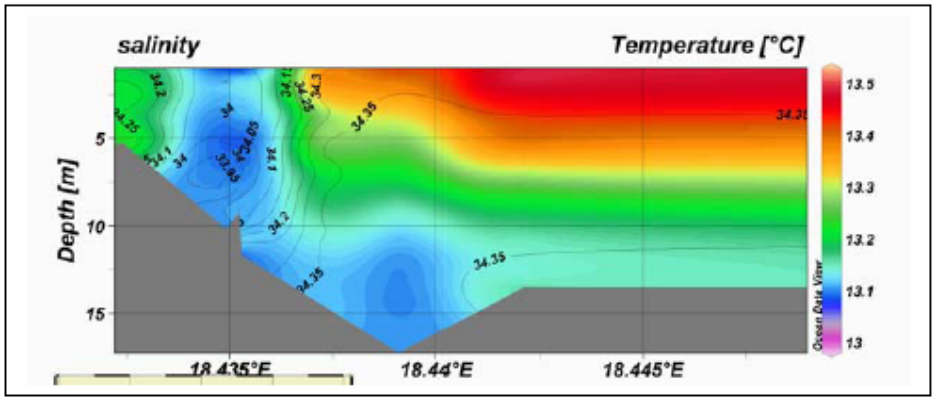


Fig.8 : Recapitulation of salinity and temperature

2.4.Conclusion

The effect of Glencairn river in the sea is not significant. Interval variation in temperature observed is 0.5°C for all stations. About salinity, this interval is 0.59‰ The discharge of river is low during the sampling period.
However, in order to make an accuracy evaluation of the impact of Glencairn river, it is necessary to undertake at least a sampling campaign in rain season and an another one in dry season. Then, a comparison could be made. For an accuracy of interpretation in ODV software, a minimum of collected data is required for each station.

Finally, I would like to acknowledge the staff of MCM, crew members in F.R.S Africana, the UCT team and ASCLME Project for this cruise and boat work. It was a very interesting training. We have acquired the basic principles, concepts, methods and technologies applied in collection of near-shore oceanographic and biological data. For all, thanks.

SAMSS Report - Njaka

During our formation, we had the opportunity to attend the SAMSS (Southern African Marine Science Symposium). For this 13th edition of the tri-annual meeting, the topic was “OUR CHANGING SEAS”. Now, the SAMSS is regarded as the most important and best-attended marine meeting in the region. It was organised in the Kramer Building, Middle Campus, University of Cape Town till Sunday 29 June to Thursday 3 July 2008.
The purposes of this SAMSS were :

- To show the results of the marine research and also to present the researches in hand
- To present the application of these results
- To discuss about marine environment
- To share experience

Unfolding of the SAMSS

About four hundred have participed in the SAMSS. They was constituted by a students, researchers and decision-maker in marine field. Some researchers from Namibia have make a presentations. More than twenty topics was covered during this meeting such as Fisheries stock assessment, Biotelemetry, Marine education and communication, … More than 200 presentations was realised except the plenary talk.

The SAMSS was also characterized by the fact that a several students preparing their PhD had presented their researches.

Opinion, thought

1. Methodology of research

All of the SAMSS presentations showed that South Africa is one length ahead of the other African countries like Madagascar in term of oceanographic research (marine biology, marine geology, physical and chemical oceanography,…).

A lot of tools are at researcher disposal such as satellite, research vessel, plane, moorings, submersibles, floats, drifters,…In this way, they can undertake specialized research. For example, they have already done several studies about large marine ecosystem like Benguala current.

About stock assessment, I was surprised by the fact that researcher use plane for their study, especially in shore angling. A case study was realized in KwaZulu-Nata coast. Even if it's expensive, It's an effective tool particularly for the region where the access is difficult.

Toutes les espèces commerciales ont fait l'objet de recherche

2. Fisheries management

Ecosystem-based fisheries management is well developed in South Africa, likewise marine protected area. All of fisheries integrate these notions. As an example is the study about reducing seabird by catch in the South African demersal longline fishery.

11.4 Mozambique

REPORT OF ASCLME TRAINING COURSE

By Avelino Langa

Agulhas and Somali Current Large Marine Ecosystem (ASCLME) Oceanography Training Course took place at the University of Cape Town between 23 June and 16 July 2008 with participation of 10 elements of 5 countries, namely South Africa, Mozambique, Seychelles, Madagascar and Mauritius.

The aim of this course was to provide students with an understanding of analytical skills in ocean data analysis and manipulation, as well as to gain hands on experience in collecting, sampling and interpreting data collected at sea.

This training was divided into 3 (three) differents parts: lectures, SAMSS (Southern African Marine Science Symposium) and work in the field (RS Africana and small boat -SeaLab).

In general mode, this course was successful, from organization, accommodation to the engagement of the lecturers. It can be said that all participants went away with some knowledge that will help them to develop their careers. On the pages bellow, will be discussed each part of the 3 (three) parts of the course.

Special thanks are dedicated to all who made this program come true, many thanks!

1. **Lectures**

The purpose of this component was to give students some idea, theoretical and than put it into practice, of the Agulhas Current System, its sources in the West Indian Ocean and its outflows into the South Atlantic and the South Indian Oceans.
This part began with some insights gained from the BCLME (Benguela Current Large Marine Ecosystem). This was very useful because it helps to understand the difference between these two projects, the difference being that this program (ASCLME) focuses on the South Equatorial Current, the East Madagascar Current, Mozambique Eddie, the Agulhas Current, the Agulhas retroflection, Agulhas Rings and the Agulhas Return Current.

Global Climate Change, Introduction to techniques in which hydrographic data is acquired and quality assured, Introduction to Ocean Data View and the analysis of hydrographic data, Fisheries management and remote sensing. Were amongst the broached subjects. The practice of dissolved oxygen titration in Lab was also mentioned.

ASCLME trainees had opportunity to work with software such as Bilko and Ocean Data View in the computer lab, to train in fish identification and general biology at the Marine and Coastal Management (MCM), just to get some practice of what they learnt in theoretical teaching.

During the lecture, instruments such as CTD, XBT, Floats and ADCP, were mentioned and presented to the students to update them on equipment used for data acquisition in the ocean.

All instructors were open able to conduct the lessons and to discuss all questions and/or doubts of the trainees, being flexible with their answers. Although some of the participants of this training are not specialists or they do not do this kind of work, they gained some knowledge to help them develop professionally.

Special attention should be given to Introduction to marine remote sensing because this topic is actually taking place in leading research all around the world covering a large area but with less cost. Due to lack of time, many topics could not be covered. One suggestion would be that basic could be chosen with specific exercise to be done in the computer lab.

SAMSS- Southern **A**frican Marine **S**cience **S**ymposium

The ASLME trainees also participated in the 13th Southern African Marine Science Symposium from 29 June to 3 July 2008, whose slogan was "**OUR CHANGING SEAS"**.

This symposium continues the tri-annual SAMSS series that began in Durban in August 1970, when 54 professional South African scientists presented papers at the 'First National Oceanographic Symposium', held in the then prestigious Lonsdale Hotel. Over the intervening 38 years the conference has grown from strength to strength, and is now arguably the most important and best-attended marine meeting in the region.

On this symposium, made by oral presentation and posters displayed on the area allocated, were presented different themes linked to marine science works, like open sea, coastal and estuarine research, fisheries stock assessment and management, marine education and communication, etc.

From the point of view of science, this symposium was very rich, sufficient educative and encouraging to emerging scientists who want to develop their careers in the near future.

2. **RS Africana**

The cruise ACLME Training, on the research vessel RS Africana, started on Thursday 3 July and returned on Saturday 5 July 2008 and the area of operation was Elandsbay to Slangkop with participation of various instructors and ASCLME students.

The objectives of this cruise were (1) to collect data on temperature, salinity, dissolved oxygen and fluorescence with the Seabird CTD 19 Plus, (2) to make mid water trawl on a target and (3) to demonstrate fish identification and general biology. Unfortunately the last two objectives were not possible to do in practice because of the weather conditions.

The weather conditions had a negative impact on this component of ASCLME training because the trainees were often seasick.

During the cruise, sampling by casting CTD was made in two stations. Have been collected samples of dissolved oxygen were collected and also the measurements of salinity, temperature and depth profile were made.

Salinity and temperature with depth profile were made during downcast and up cast on real time. The water samples were collected for dissolved oxygen analyses later. To collect the water samples the CTD was stopped at the required depth for a minimum of 20 seconds before triggering each bottle.

3. **Work Boat (SEA LAB1)**

The last week of ASCLME training course was dedicated to working on a small boat and the area of study was around False Bay (Glencairn Bay).

The general aim of this component was to make students gain a practical level of knowledge in the acquiring and processing of hydrographic data, specific to determine the movement and distribution of the contained plume native from river discharge in Glencairn Bay, on 11 July 2008. The equipment used for this component included a small CTD, a GPS and a net for chlorophyll sampling.

The first step of this stage was to give students the opportunity to put into practice what they had learned in the classroom, linking to (1) how to deploy and operate equipment and instruments, (2) real-time acquisition and processing principles and sequence and (3) the importance of correct sampling techniques, real-time data control and quality assurance.

And finally the planning and execution of a scientific survey was done.

Area of Study

False Bay is situated in the south of Cape Town, with an approximately square body of water with sides which are some 30 km in length. It lies between 34°04' and 34°23' south latitude and 18°26' and 18°26' east longitude.

The bottom of this area is generally smooth, sloping gently downwards from north to south, such that the depth at the centre of the mouth is about 80m. The winter weather is characterized by disturbances in the circumpolar westerly winds, resulting in a series of eastward moving depressions, which brings cool, cloudy weather and rain from the north-west.

Ocean current is dominated by Agulhas and Benguela currents. The Agulhas current flow southward along the eastern coast of South Africa, it has velocities varying from about 40 $km.d^{-1}$ in July to about 60 $km.d^{-1}$ in April.

Methodology

A total of 10 stations have been selected to collect data of parameters such as salinity, temperature, and depth using the CTD and water samples to determine oxygen dissolved. Data from the CTD, was used to see the variation of the water coming from the river. All profiles of temperature and salinity were processed in Ocean Data View (ODV).

Water sample was analyzed in the Laboratory using Dissolved Oxygen Titrations Methods which consisted of adding separately into each beaker with water sample: 1.0 *ml* of manganese chloride, 1.0 *ml* of alkaline iodide and 1.0 *ml* of 50 % of sulphuric acid and mix in between each addition. Later this was titrated against the sodium thiosulphate solution and the volume of tritate was recorded.

Dissolved oxygen was calculated using the formula below (in $ml.l^{-1}$):

$$DissolvedOxygen = \frac{a * f * 0.112 * 1000}{b - 2}$$

Where: **a** = sodium thiosulphate solution; **b** = volume of the water sample = 118,98 ml ; and **f** = factor=1

Results and discussion

The water temperature varied from 12.9°C to 14.4°C, being colder near the coast. Salinity varied from 32.4 to 34.7 *psu* (Figure 1-2). It becames difficult to analyze the distribution of the plume based on the profile presented below, because it would be better to analyze it using each section. Looking for the station on the left side of the rover mouth, the water temperature is too cooler then the right side. The salinity of the water is higher on the left side than the right side of the mouth of the river. This case can be associated with the influence of the tide current. The water column is slightly mixed in the middle section (Figure 1-3, Annex).

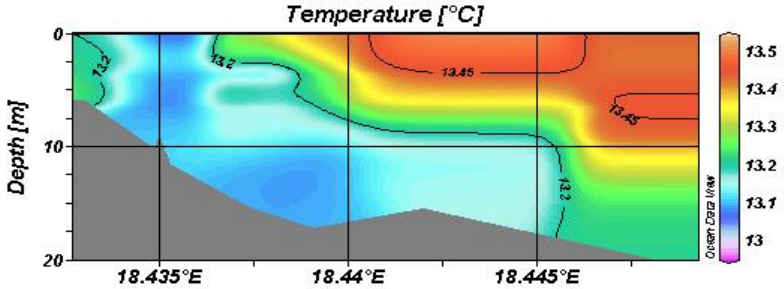


Figure 1 - Temperature Profile from CTD data collected in Glencairn Bay, 11 July 2008.

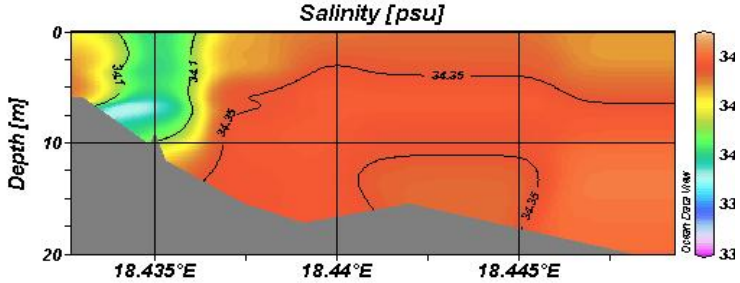


Figure 2 - Salinity Profile from CTD data collected in Glencairn Bay, 11 July 2008.

Concluding Remarks

On the left of the river mouth, ocean/sea water is most prominent whereas in the middle of the river mouth the river discharge is most prominent and the right side of the river there is a mix.

Annex

Profile of Temperature and Salinity

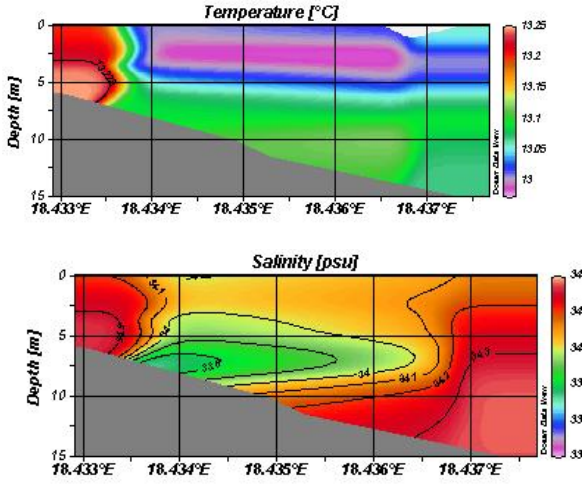


Figure 1 - Section from the left side of de river mouth. Characterized by cooler water and high salinity

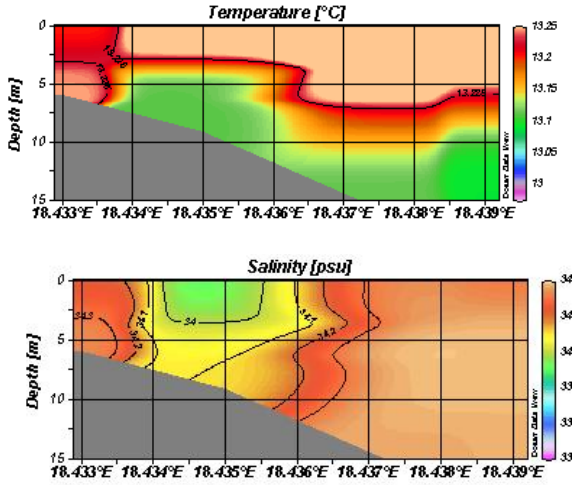


Figure 2 - Section from the midpoint side of de river mouth. Note that water temperature increased and salinity decreased.

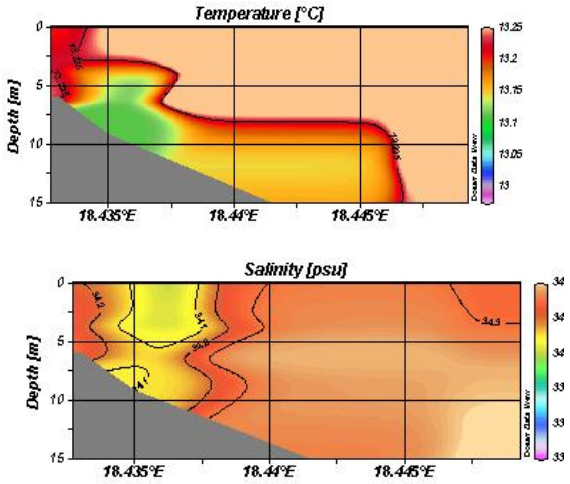


Figure 3 - Section from the right side of de river mouth. In this sections is evident the mixed water, characterized by increment of the temperature.

MA-RE Institute – ASCLME Oceanographic Training Course & Cruise

Training Course Report – Fernando Tavares Caniua

INTRODUCTION

Organized by ASCLME Project, took place from 23rd of June to 16th July, 2008 in Cape Town, South Africa a Regional Training Course on Oceanographic and Biology, where were present 5 country namely Madagascar, Mauritius, Mozambique, Seychelles and South Africa. Two participants represented each country, personally and my colleague Mr. Avelino Adolfo Langa represented Mozambique.

For me this training programmer, was really interesting and brought new knowledge to me as person and as technical. I am working for Ministry of Environment, Department of Coastal Management but technically we are limited on land area survey.

Within Ministry of Environment we have three areas working in the Coastal Zone namely Department of Coastal Management at Central level, related with Policies, Programs, and Plans and Two Centres related with studies and researches such as Sustainable Development Centre for Coastal Zone (CDS-ZC) located in south of country and Coastal and Marine Research Centre of Pemba (CEPAM) located in the north of country.

The Pemba Centre (CEPAM) was supposed to be Regional Centre, especially for East Africa Marina Eco-Region (EAME), there are new Infrastructures established but it doesn't have instruments and equipments for researchers work. So this training course opens my mind about what kind of instruments and equipment we need for a Centre like that for one hand and, for other hand I see opportunity for partnership between the Centre and the Marine Research Institute of University of Cape Town.

For this opportunity I would like to thank the ASCLME Project because I will improve a lot issues related with instruments and equipments to ask from my office, kind of cooperation that we need with other Institutions, how to divide work in the group and among Institutions, what data we need in the field and how to collect, and other aspects.

SAMSS

The Conference component was really useful, not only for training course but also to learn the different methodologies for data collection, how to process information and how to present it.

For the training course, the conference gave the idea about what are we going to collect in the field and how to use it. It increases our expectative about the boat work. One of mast important think on the conference was diversity of contents, areas and experts.

VNS AFRICANA

In the cruse I fell very badly in the first day and I didn't follow all steps. In general the Cruse mission comes to confirm all expectative about the equipments, we had opportunity to see and to manager the instruments and materials. Especial interest was to work with NISKIN BOTTLES.

The most interesting activity was to see NISKIN BOTTLES bringing at same time various data such as temperature, salinity, nutrients, CO2, depth and others.

FIELD SURVEY AT SIMON'S TOWN

The Simon's Town surveys were more integrated because we had opportunity to cover both areas, in the sea and at land parts, so we could assess how the two areas can influence each other.

The land part shows us relevant information about land cover, land reclamation, land management, local topography, protected area and other issues.

The sea part was concentrate on survey of salinity, temperature, oxygen and depth. The oxygen was calculated in the laboratory through chemical reactions and it shows variations from the down stream of river to the large sea (high to low). All other data was processed in the sea and analysed in the class.

In general, the training programmer was relevant for me and for my Institution and I hope to have opportunity to improve sea data survey and analyse.

11.5 South Africa

ASCLME OCEOOGRAPHIC AND BIOLOGICAL TRAINING.

Introduction

The ASCLME training course started on the 23 June and end up on the 16th of July 2008 (Four weeks period).The training was providing the rhetorical lecture, practical at sea, working at the laboratory and computer with the work (odv).

WEEK ONE

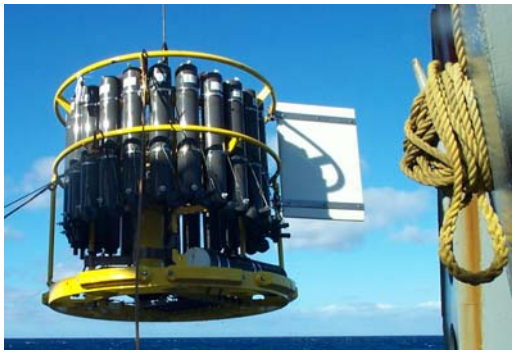
The first week of the ASCLME course was about lectures and this was done to make us understand how research is done.

1ST lecture:

- Introduction to techniques - how hydrographic data is acquired and quality assured. Tools of the trade – an overview of oceanographic equipment (CTD, Floats, ADCP, XBT etc.).

- Data acquisition software – advantages and limitations.
- Ensuring data quality – Calibration, filtering, aligning and bin averaging data processes and the effects of pitch and roll on CTD data collection. Introduction to Ocean Data View and the analysis of hydrographic data
- Good understanding of oceanographic instrumentation
- Problems with CTD data.

Types of instrument used at sea – what goes where?
(See pictures below)



PICTURE 1: Using CTD African ship

PICTURE 2: Using small CTD in small boat

Lecture two: Marine Pollution and Water Quality.

The sources of the marine pollution were discussed and some of them are as follows.

- Oil pollution
- Eutrophication
- Water pollution

Oil

Eutrification

PICTURE 3: Causes of marine pollution.

The following Methods of sampling hydrographic variables were discussed during pollution lecture.

1. Continuous Profiling

- Instrument lowered at a steady descent rate.
- Samples electronically at a rate of (say) 2x per second.

2. Depth-specific (spot) measurements

Instrument lowered to specific depths over the range
of the water column. Readings are written down or
Logged and plotted later.

3. Bottle sample (for later analysis)

Lecture 3.

The lecture was about the ecosystem approach to fisheries, the principles and action plan form main topics of the lecture principles such as the following were discussed:

- Avoiding over fishing
- Ensuring reversibility and rebuilding
- Minimizing fisheries impact
- Considering species interactions
- Ensuring compatibility among institutions
- Applying the Precautionary Approach
- Improving human well-being and equity
- Allocating user rights

How do we implement EAF?

- To implement EAF we need to translate the principles into policy and action
- Translation of principles into high-level policy goals which reflect the overarching principles outlined in relevant domestic legislation, regional agreements and international agreements.

NB: Some of the lecture includes the greater AGULHAS system, the global climate change and how to build a habitable planet, marine remote sensing etc.

WEEK 2

The second week of the training was about the SAMSA conference were by all student attended the presentation of his or her choice and one of the presentation that attended was : Can a marine protected area protected mobile fish?

I Find it very interesting and very related to our course because the research was done by measuring the physical and hydrological factors using the same instrument that we were using during the course for example during their survey they used telemetry as an instruments for sensing and tracing the fish and CTD instrument for measuring parameters such as the temperature and salinity.

Most of the scientist use the same method that we are using at Marine and coastal management (MCM)

What impressed me most is the solution that they came with which is to time the movement of the fish (the management of marine protected areas is difficult than measuring or timing the movement of fish using equipment such as telemetry.)

During the SAMSA conference we had a chance to visit MCM for fish identification. We learned how to identify fish by counting the number of spines and soft – rays in the dorsal and anal fins to key out the species after completing the count we were referring to the fin formula key in *smith sea fishes*

The aim of visiting the MCM fish lab was to prepare us for the sailing trip which was coming the same weekend.

WEEK THREE

On the 3rd of July we had a three days sailing trip and the objective of the trip was to monitor the general oceanography and plankton in St Helina bay, to collect data on temperature, salinity/dissolved oxygen with the seabird CTD, to learn about the bottom trawl and trawling operations, fish identification and general biology.

We learn more about CTD operation by lowering it into the water to record the temperature, salinity and taking oxygen samples from the ctd 12-bottles rosette sampler which was later fixed and titrated.

Due to the rough weather some of the student didn't manage to attend other demotration such as the trawling of fish and that was due to the Sea sick problem.

The sailing trip was much similar to our (MCM) normal trip and operation and there was nothing new to me but I did learn a lot and exposed to other operation such as the operation of the CTD.

WEEK FOUR

This was our last week of training and we visited Mossel bay to work with small boat in a harsh condition. During training in Mossel bay we learn more about the using of the Bongo net for measuring the plankton.

We also learn more about using the XBT system (small manual ctd) were byInstrument lowered to specific depths over the range of the water column. Readings are written down or logged and plotted later (also see figure three)

PICTURE 4: Small PC for plotting and logging data.

My concern is the type of the CTD that we used in the small boat because it does not have oxygen census and in order to get oxygen readings the sample were taken by using the small bottles which was later fixed.

A research exercise was done in Glencain bay to determine the movement of diluted water originated from the river discharging in the bay, only three parameters, salinity, temperature and oxygen were taken. The fixation of dissolved oxygen, titration and calculation was done at the University of Cape Town laboratory.

The student was divided into two groups and I was in group B, we collected the data in 10 stations and the orange station which is far from others was taken as a control station. See the salinity below.

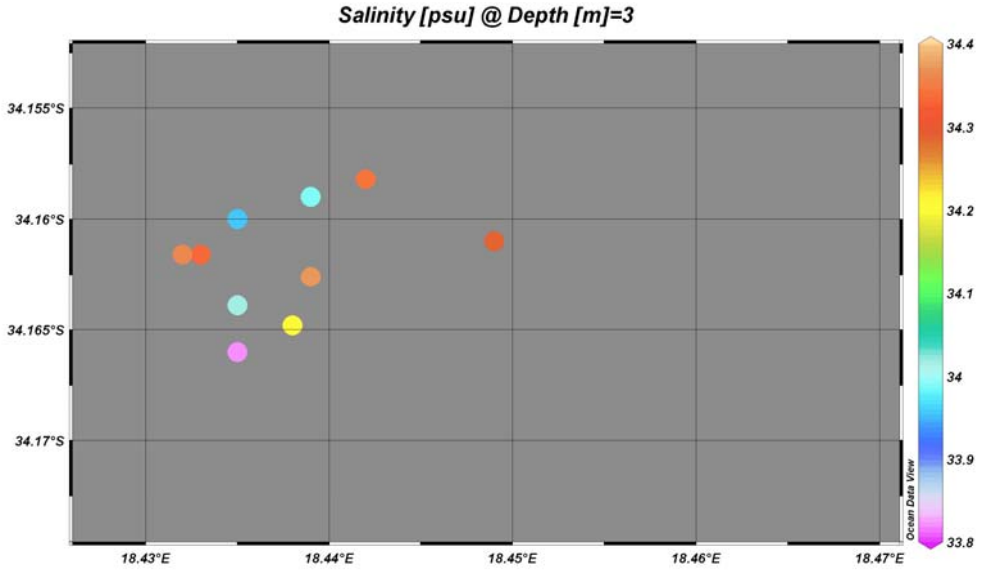


FIGURE ONE: Sampled station in False Bay.

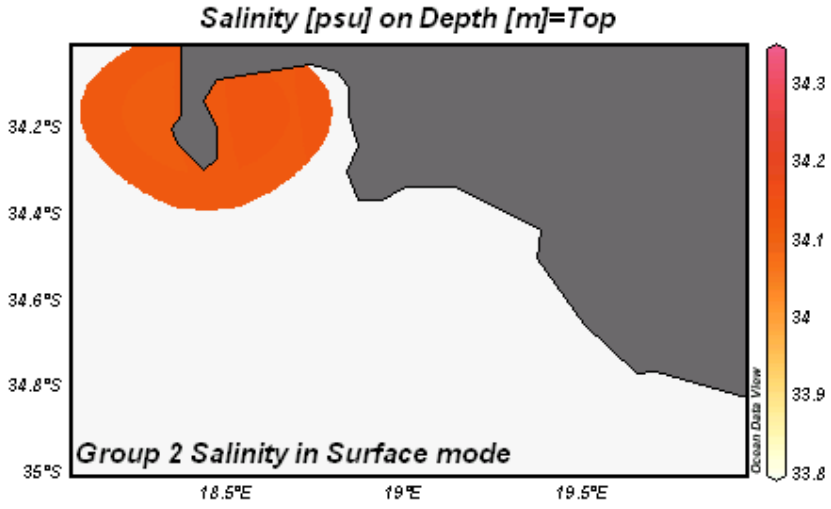


FIGURE TWO: Data transferred into Ocean Data View (ODV)

General comment

The course was good and I really learn a lot during the course and I find it very important for any new MCM employee to attend the same course and the course should be available for the new employee every year because it really helps a lot. It was also good for me to meet people from other countries.