

Li Po Chun
United World
College
of Hong Kong



Coral Monitoring Report
July 2007
Hoi Ha Wan Reef Check

Prepared By Julie Harris
August 2007

Abstract

Students from Li Po Chun United World College of Hong Kong have undertaken reef check surveys of 5 coral sites within the Hoi Ha Wan Marine Park in the Sai Kung Country Park, Hong Kong. The aim of this project was to create a baseline study, assessing the health of the 'reefs' at the five sites and to repeat the procedure annually and in so doing monitor any changes that occur. This report will outline the procedure and provide a summary of the data collected in 2006/2007.

This information will be made public on the college web site and sent to relevant organizations such as Reef Check, Reef Watch, Project AWARE, AFCD and the WWF which has a marine educational center in the Park.

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Acknowledgements

The students who undertook the survey work for this report.

Names and home country are included

Graduated May 2007

Chrys (USA)	Yahia (Egypt)	Nikola (Serb)
Cedar (USA)	Tasha (Phil/Den)	Valerie (HK)
Astrid (USA)	Yasmin (Bahamas)	Mandy (HK)
Enoch (HK)	Kelvin (HK)	

Graduated May 2006

Paula (Canada)	Alaa (Jordan)	Emma (Finland)
Taufiq (Canada)	Branka (Macedonia)	Eugene (HK)
Nick (USA)	Tinka (Germany)	Jason (HK)
Mikus (Latvia)	Dominic (HK)	Marianna (Brazil)

Graduated May 2005

Kaitlin (Canada)	Sunneva (Iceland)	Anthony (HK)
Francine (Netherlands)	Stratos (Greece/Australia)	Francisco (Ecuador)
Meredith (USA)	Roy (HK)	Marie (France)
Julia (Germ)	Brijlal (Nepal)	

Graduated May 2004

Miriam (Germany)	Eduardo (Costa Rica)	Paolo (Bolivia)
Scott (USA)	Natasha (Australia)	Jonas (Germany)
Diana (Colombia)	Ido (Israel)	Paul (Cayman Islands)
Findy (HK)	Daniel (Mexico)	

Linda Olson fellow dive master and co-leader.

Although no longer at LPC **Dr. George Woodman**, director of the charitable organization Teng Hoi,¹ was very involved in setting up Coral Monitoring at LPC and continues to help us on many occasions.

The generous support from **Bunn's Divers Institute**, who provide our students with both essential training and gear.

Donno, Frank, Madonna and Josephine from **Big Lalaguna Beach Club**² in Puerto Galera, Philippines for their continued support of our training program in March every year.

PADI especially **Joanne Martson** from Project AWARE, Asia Pacific, for organizing donations of Open Water training books and coral watch charts

WWF for training with coral ID, advice and support.

AFCD for providing us with anchor permits in Hoi Ha Wan.

Reef check for providing a monitoring procedure that we have adopted.

Hong and Sophia for safely delivering us to Hoi Ha Wan every Saturday.

¹ www.tenghoi.org

² <http://www.llbc.com.ph/home.html>

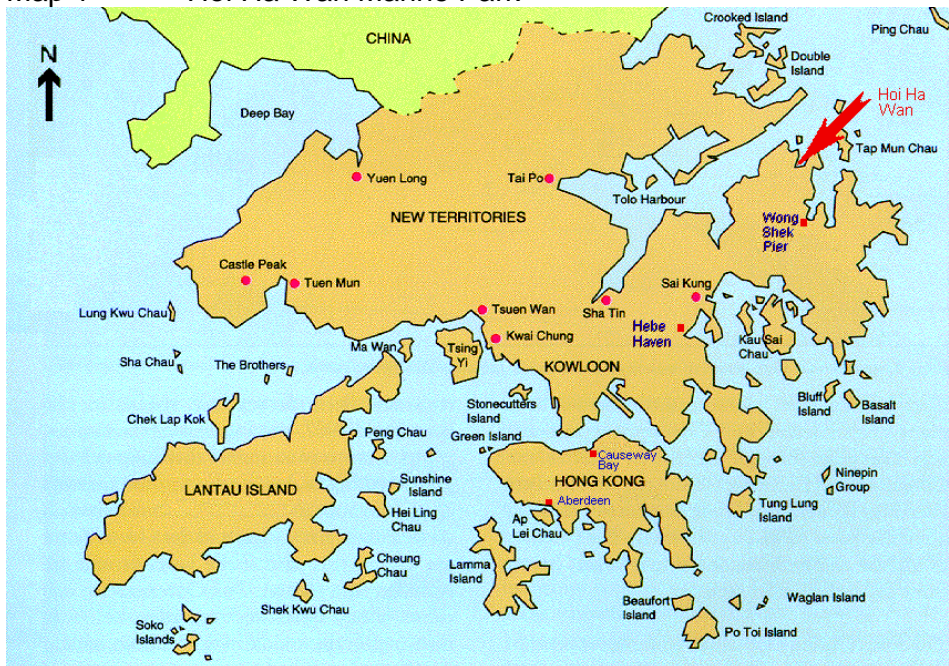
Introduction

In September, at the beginning of every academic year at Li Po Chun United World College (LPC), twelve to fourteen first years, from all over the world, are selected to join the LPC Coral Monitoring team. They will be part of this team for their full two years at the College and this activity will make up the main service component of their International Baccalaureate Diploma. It provides the opportunity to learn how to dive, to gain exposure to marine ecological work and to contribute to the growing number of programs aimed at conserving the Hong Kong environment.

1. What we do

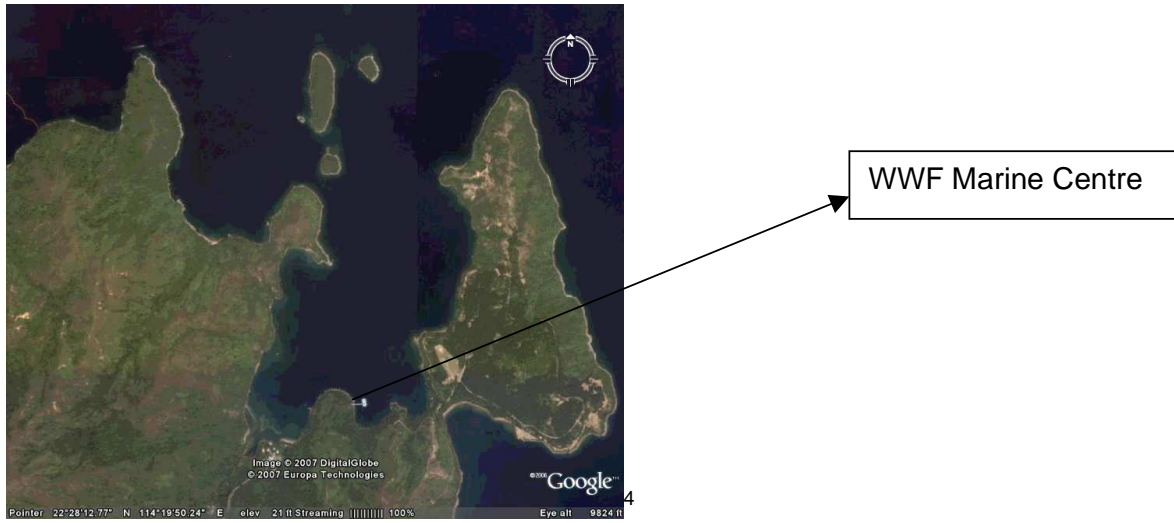
After one full year of training in both Hong Kong and in the Philippines the students are trained to monitor the health of 5 coral areas/sites (map 3) within the Hoi Ha Wan Marine Park in Hong Kong's Sai Kung Country Park (map 1 and image 2). These sites are also used for educational purposes by the WWF as depicted in map 4.

Map 1 Hoi Ha Wan Marine Park

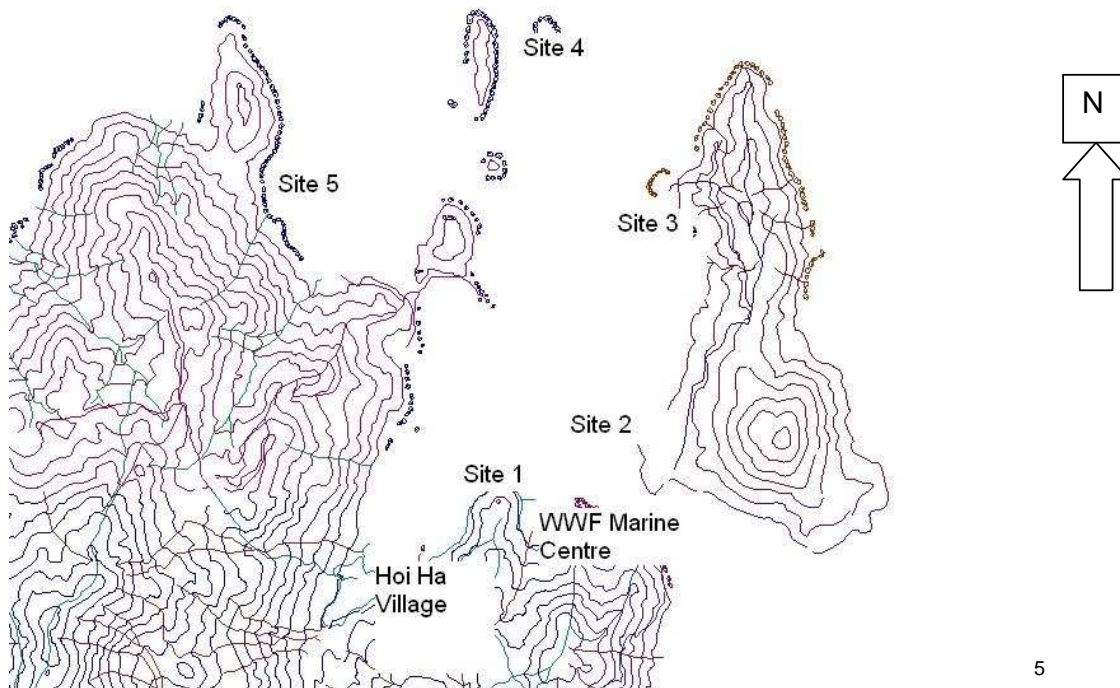


³ http://www.scuba.net.hk/oceanway/Local%20dive/hoiha_gt.gif

Map 2 Google Earth Image of Hoi Ha Wan

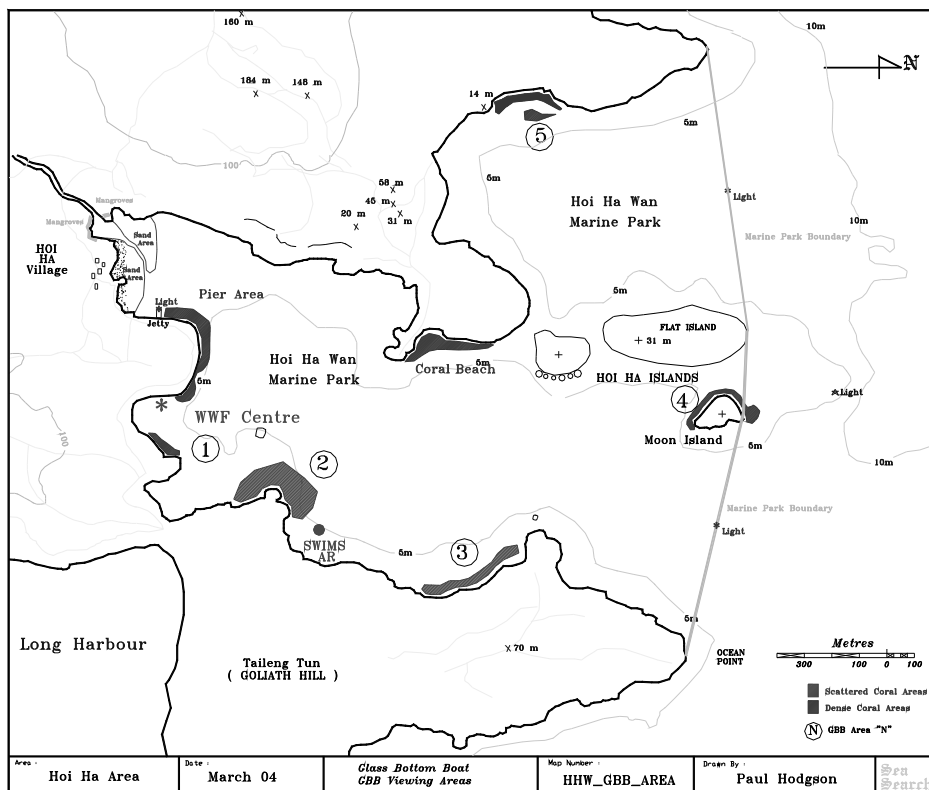


Map 3 The 5 sites we monitor



⁴ Google Earth image
⁵ Map edited using ArcMap

Map 4 Map showing the route followed by the WWF's glass bottom boat



A Year 1 Training

Hong Kong: PADI Open Water training

The first years, in September, fill in an application form and undergo a selection procedure that is conducted by staff and second year coral monitors. Once selected, they will begin their PADI open water training, which is conducted by a local dive school, Bunn's (<http://www.bunnssdivers.com/>). This training takes place on weekends and involves a number of training dives as well as a formal examination. Bunn's provides both the training and most of the diving gear that we use for free and in return they have free use of the College pool at certain times in the year for training their clients. Given the costs involved in this type of activity we are very grateful for the support they give us.

Philippines: Marine Identification

In the second semester we take the newly qualified open water divers to Puerto Galera on the island of Mindoro, Philippines. This trip takes place during the College Project Week, which is usually in early March. This trip is lead by both staff leaders Julie and Linda (both PADI dive-masters), often with the help of one or two second

⁶ Map courtesy of WWF Hong Kong

year students as well as some local Puerto Galera dive-masters. During this week the students are taught about dive safety, marine identification and most importantly reef check survey methods. Below is the plan for the training week from 2007. The dive company we use is Big Lalaguna Beach Club where Donno and Frank have been great in accommodating and supporting our team.







LPC CORAL MONITORING 2007



LPC Marine Identification & Survey Methods Course Puerto Galera March 2007

	Morning Session	Afternoon Session
Saturday 10 March	Depart from College Transfer to Puerto Gallera Briefing pre-dinner	
Sunday 11 March	Coral Importance and Threats (Yahia and Julie) – DVD Blue Planet. Sketch map - snorkel competition in two's (Yahia and Julie) Snorkel 1	Inverts on the reef (LO) Dive Safety and buoyancy (JH) Dive 1 – gear/in water skills Julie and Linda take out 2 students at a time to revise/check gear etc.
Monday 12 March	Symbiosis on the reef (Yahia and Tasha) Developing good ID skills (Tasha) Dive 2 – ID, Inverts, Symbiosis	Coral Structure and Life cycle (LO) Coral growth forms and classification (LO) Identification of 5 Hard Coral genera (JH) Dive 3 – Hard coral ID
Tuesday 13 March	Coral classification (cont) (LO) Identification of more hard and soft coral genera (JH) Dive 4 - Hard and Soft Coral ID	Major fish families (Tasha) Fish coloration and ID features Introduction to larger pelagic fish species (Yahia) Test Dive 5 – Fish Id
Wed 14 March	DAY OFF	
Thursday 15 March	Revision of all covered Dive 6 - Revision	Boat dive briefing (JH) Dive 7 – Drift dive
Friday 16 March	Point and line transect methods for underwater surveys (JH, LO and Yahia) Compulsory – exhausting - observed Dive 8 – Transect/Reef check	Briefing on Sabang wrecks dive (JH) Dive 9 – Sabang Wreck Finding Nemo (Tasha)
Saturday 17 March	Transfer to Manila home to LPC	

Map and photographs – Philippines training

<p>The Philippines</p>  <p>Manila Puerto Galera</p> <p>7</p>	 <p>The 2006-2008 team on their way to PG</p>
 <p>Divers submerging</p>	 <p>Role playing in the classroom</p>
 <p>Yahia (Egypt) and Tasha (Denmark) our second year leaders</p>	 <p>Chris (USA) successfully ID's Porites</p>

⁷ <http://www.glennevanish.com/Puerto/puerto/PhilsMap.gif>

Peer to Peer training

In April the first years get to put what they have learned in the Philippines to the test. They go on two training dives in Hoi Ha Wan each having a second year buddy who shows them the ropes.

B Year 2 Reef check in Hoi Ha Wan

In Year two the second years take on responsibilities such as looking after the gear store, the medical aid kit, oxygen supply, etc. Most of our Saturdays during the first semester are used for diving in Hoi Ha Wan on Hong and Sophia's boat.



Hong and
Sophia's
boat

The team gets to put all of its training to use, we have 5 to 7 dives (weather permitting) throughout the first semester in an attempt to conduct a thorough reef-check on all 5 sites.

Hoi Ha Wan Reef check procedure

On arrival at the site the students will complete the following in buddy pairs:

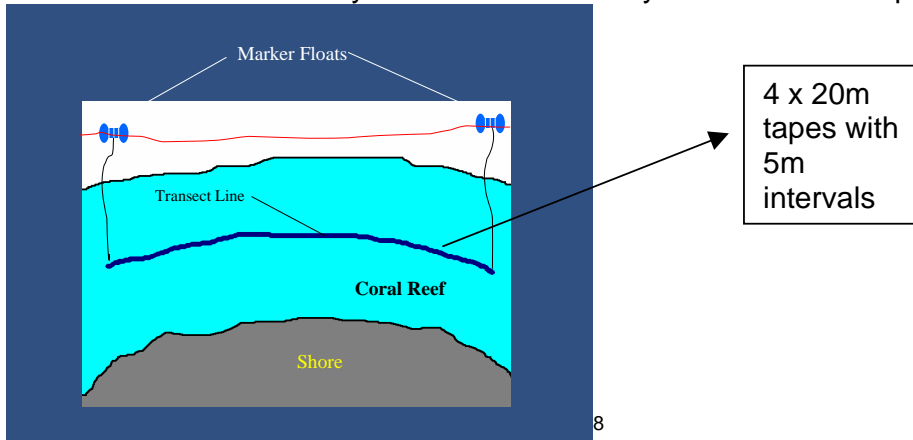
SNORKEL

Four buddy pairs snorkel the reef to determine its extent, we need a 100 m continuous reef to conduct a check on its health. Landmarks are found on the shore that can be used to identify the beginning and end of the section we are going to study. Finally, one student fills in a site description sheet.

DIVE

Team 1 2 Buddy pairs and two dive masters

A weight belt and buoy are placed at the beginning of the transect and a GPS is used to locate the start point. Due to the nature of HK reefs we focus only on one shallow contour unless an anomaly exists. This is usually less than 3m deep.



Four 20 m long line tape measures are laid along a designated depth contour with 5m intervals in between each. As far as possible they follow the reef. The tape measure is placed as securely as possible on the reef, rocks/weights are used at times to hold the tape in place. Care is taken so as to not damage any of the reef.

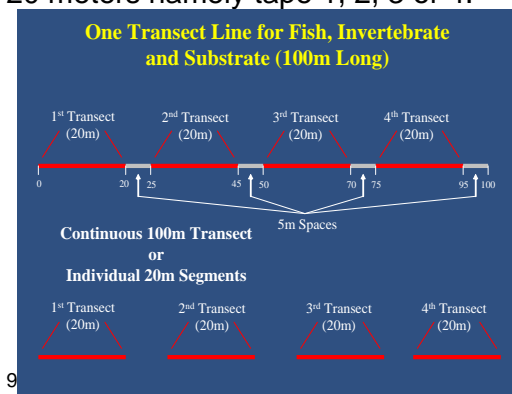
This process takes about an hour.

Once the tapes are laid an underwater digital video (see accompanying CD-ROM) is taken along the length of each transect.

The team returns to the boat and then waits for 15 minutes.

Team 2 4 Buddy pairs and two dive masters

4 Buddy pairs enter the water to conduct a Reef check survey of a given segment of 20 meters namely tape 1, 2, 3 or 4.



⁸ Slide taken from reef check training power point

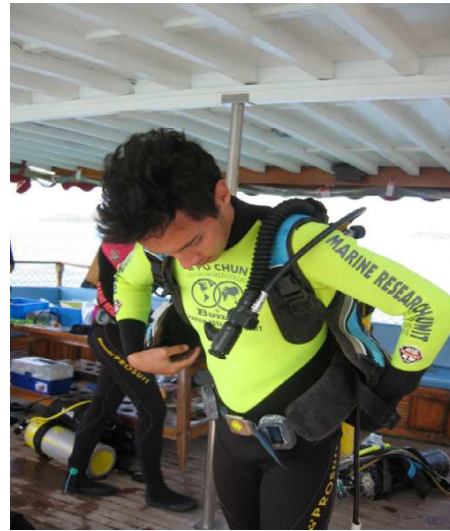
⁹ Taken from Reef Check training power point

The students follow reef-check procedure, first completing a fish survey along the tape, thereafter an invert survey and finally the students record the substrate found at every 50cm interval.

Some photographs of the team at work in Hoi Ha Wan follow. A copy of the data entry sheet used is in the appendix (1). This is photocopied onto waterproof paper and attached to a diving slate.



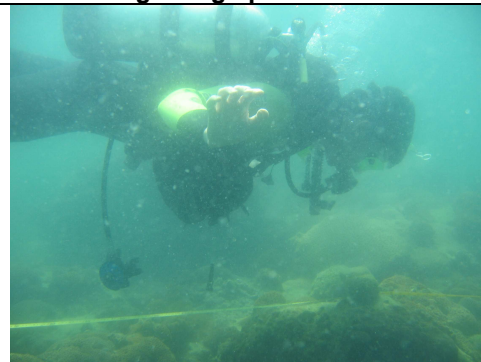
Julia snorkelling



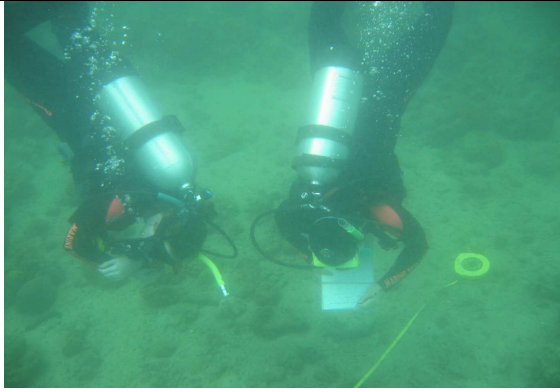
Francisco gearing up!



Anthony's (Hong Kong) giant stride boat entry



Getting close to the coral for ID, visibility in HK waters is not brilliant.



Recording the inverts.



Tape measure passing through Goniopora.



Traditional post dive 'jump'

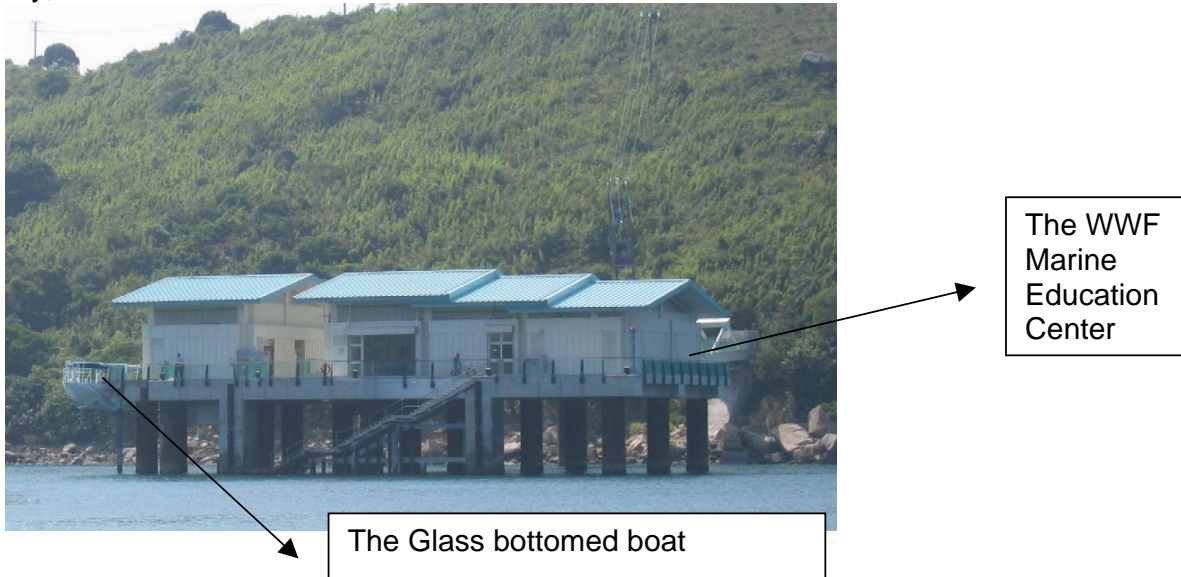


A successful days diving completed

After the dive

On the Monday during service planning, the collected data is entered, collated and graphed for easy comparison with later dives. This information will form the basis of the coral monitoring report for that year group. The same procedure will be followed by successive teams allowing for the monitoring of any change in trend at the five sites.

The data collected for 2006-2007 follows on page 14 and will serve as the baseline study. Prior to this the earlier teams were mapping the substrate of the entire circumference of Hoi Ha Wan, this data is being used to create a map/model of the bay, which is intended for the WWF marine center which is located in the Park.



C Extra work done by the team

Creation of a model map of the park for WWF

Using the substrate data that has been collected by LPC Coral Monitoring teams over the past 8 years, the plan is to create a scaled down model of the park, focusing on what substrate is found along the shore to a depth of about 4 meters. This project was started by Julie and some 2007 graduates and is ongoing.

Hoi Ha Wan Cleanup

If data collection goes well, we can afford (time and expense) to use one of the later dives for a reef clean up. We usually select a site that has a problem with abandoned ghost nets. The students use gloves, scissors and nets to gather the rubbish. As the students are on SCUBA they have to be very attentive to safety on this day.

Fish bomb detector installation

In November 2006, Julie and Linda and some of the Coral Monitoring team helped Dr Woodman install a bomb detector under the WWF center in the Hoi Ha Wan Marine Park.



Astrid, Tapio and Hong prepare the tripod for entry.



Henry and Andrea were responsible for installing the 'very expensive' hydrophones.

See newspaper article from South China Morning Post, Nov 2006, in appendix (2).

HOI HA WAN REEFCHECK SURVEY – BASELINE RESULTS AUG 2007



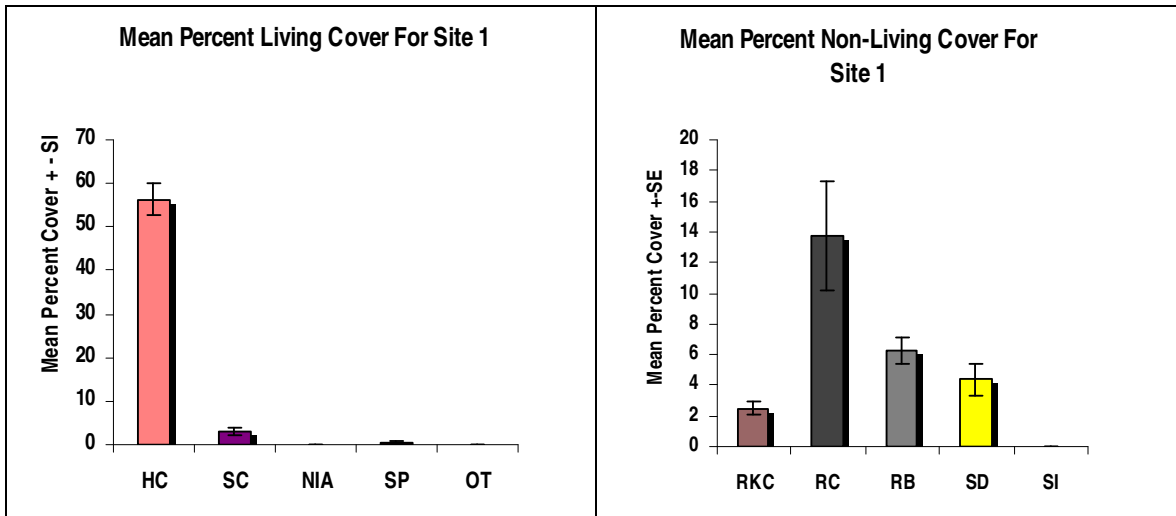
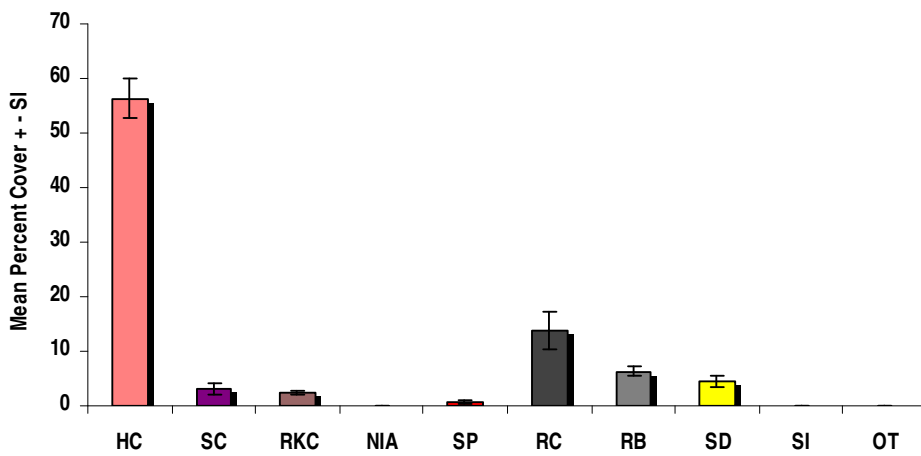
Location of site 1

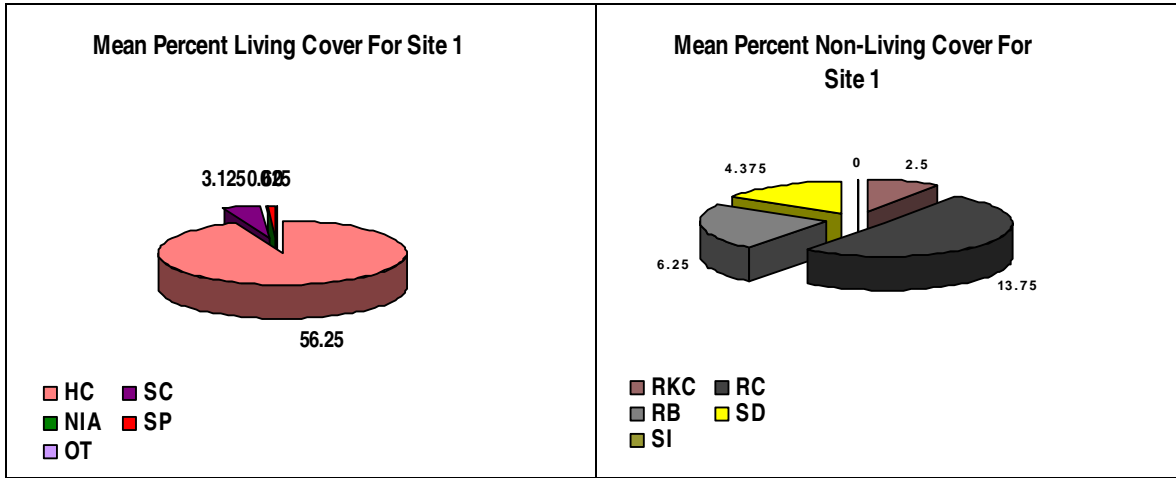
Site 1

Date – 23 Sept 06

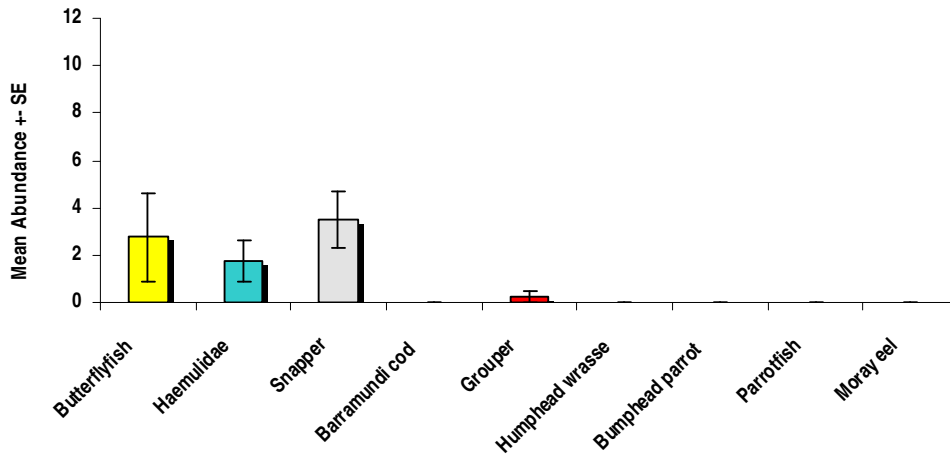
Ave depth – 2 -2.5m

Mean Percent Cover Of Substrate For Site 1

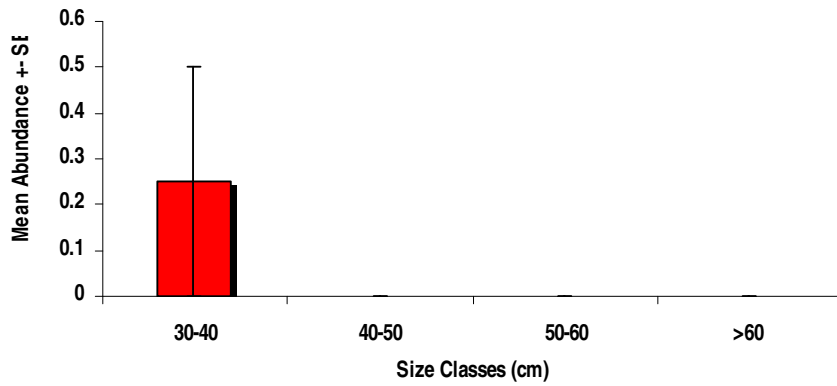




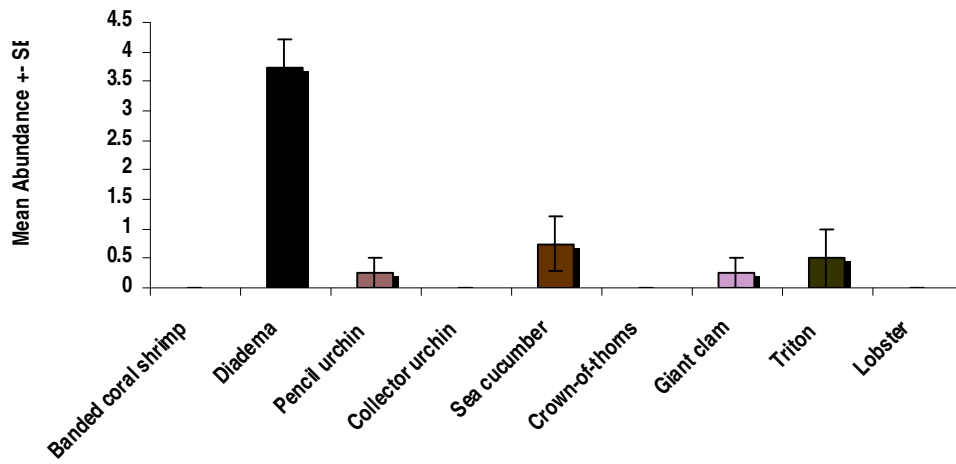
Mean Fish Abundance For Site 1



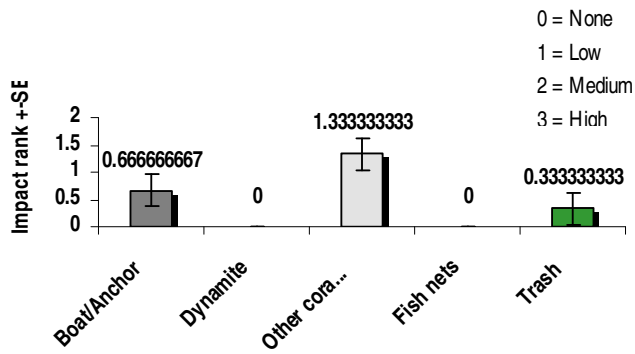
Mean Size Class of Grouper Observed at Site 1



Mean Abundance Of Invertebrates For Site 1



Incidence Of Impacts For Site 1



Site 2

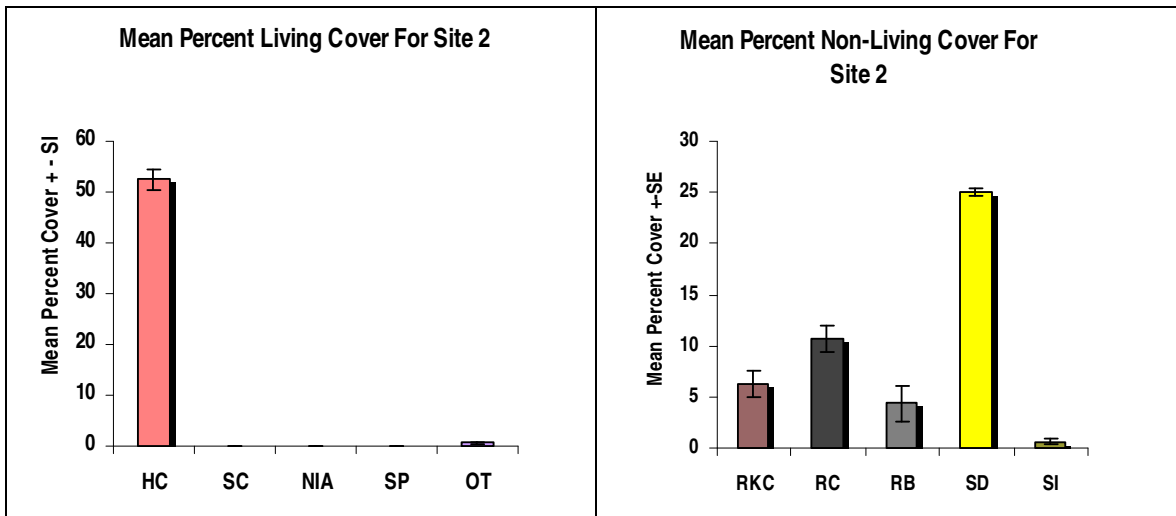
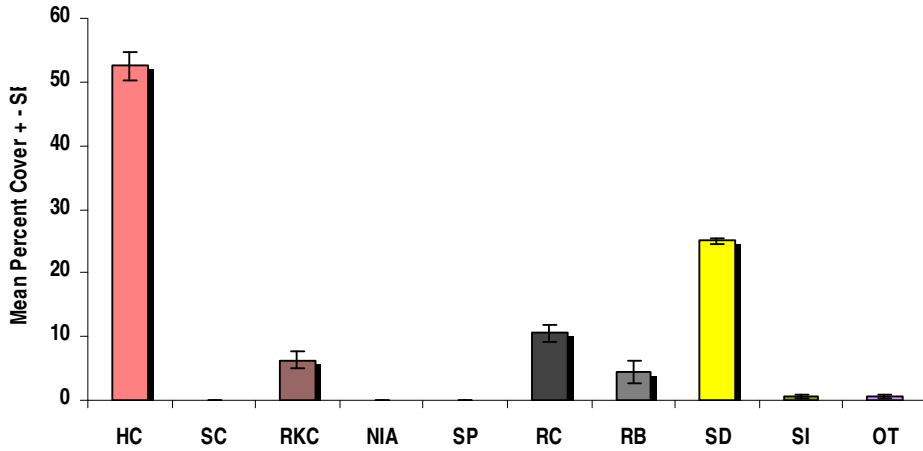


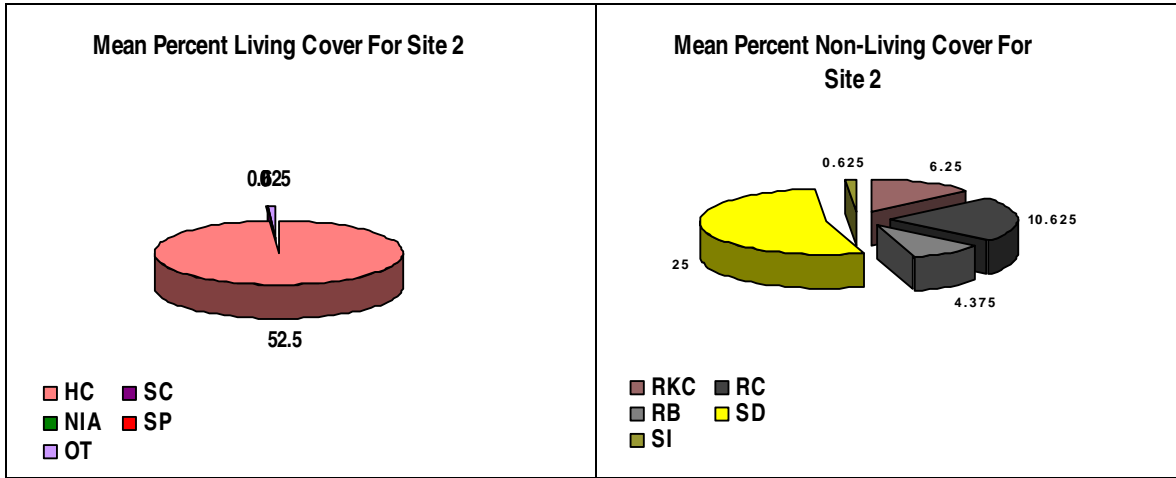
Location of site 2

Date – 30 Sept 06
 Depth – 2 -2.5m

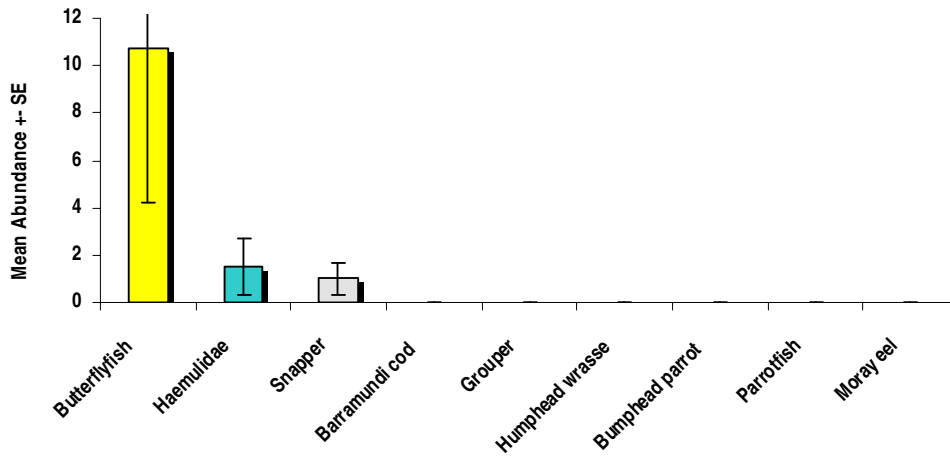
Mean Percent cover of Substrate for Site 2

Mean Percent Cover Of Substrate For Site 2

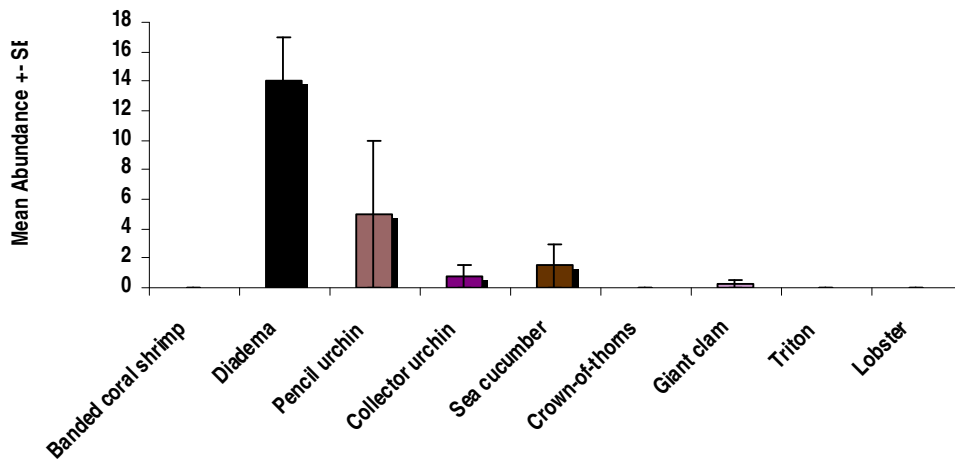




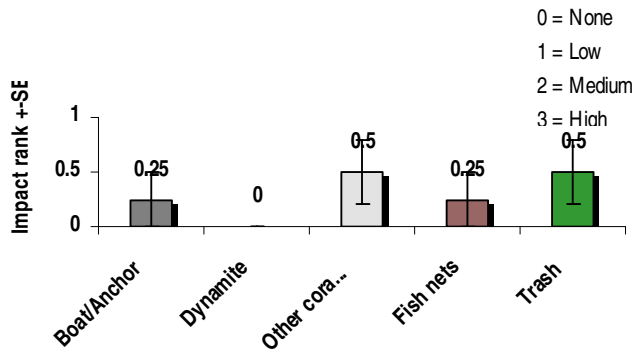
Mean Fish Abundance For Site 2



Mean Abundance Of Invertebrates For Site 2



Incidence Of Impacts For Site 2



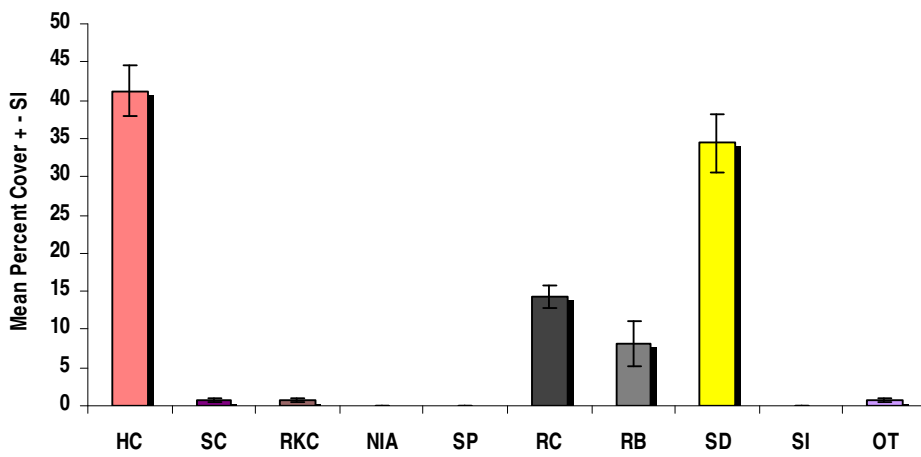
Site 3

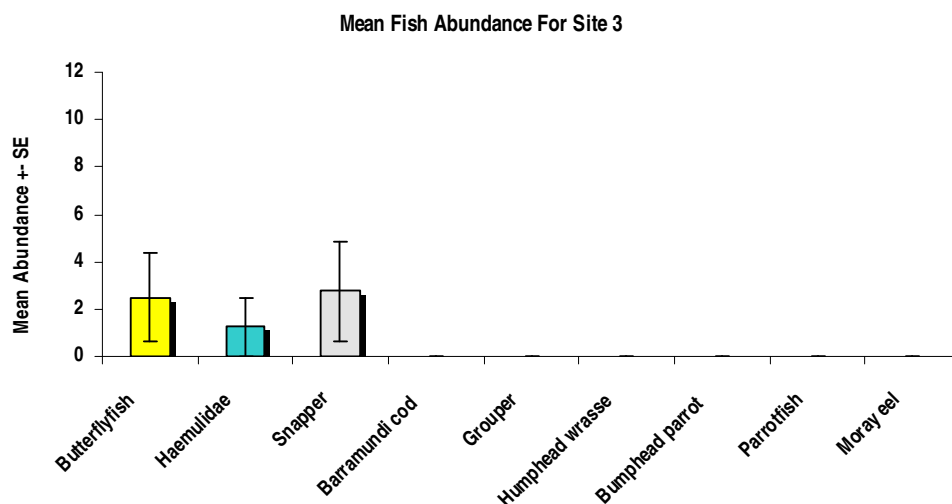
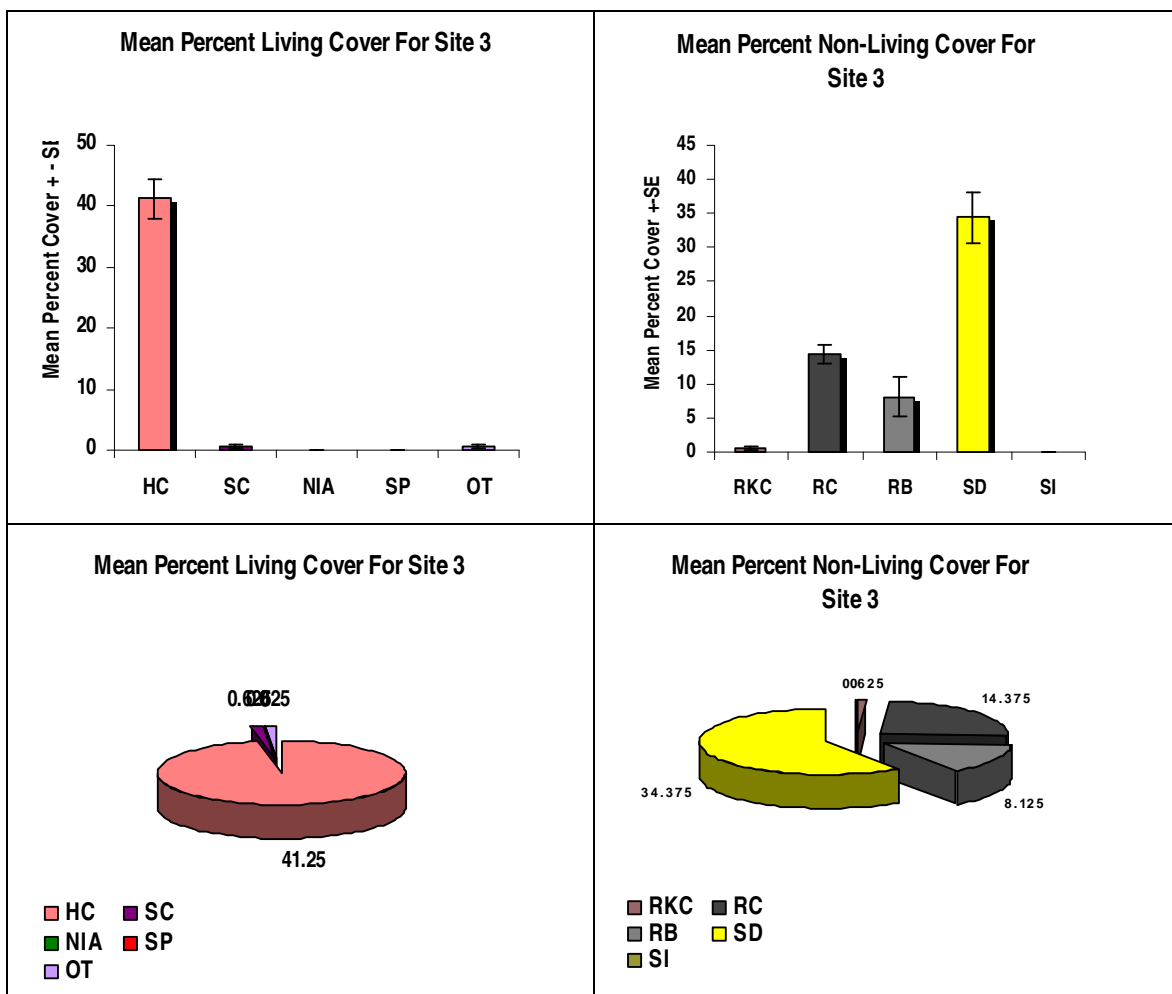


Location of site 3

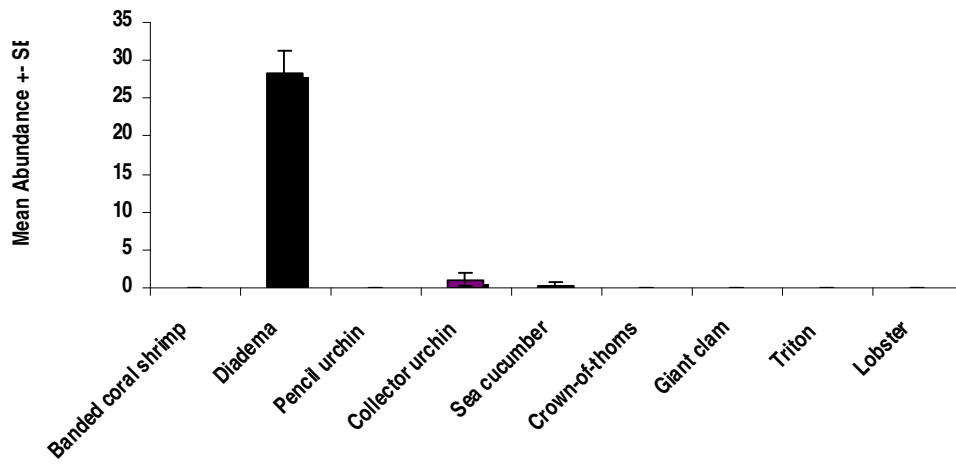
28 October 2006

Mean Percent Cover Of Substrate For Site 3

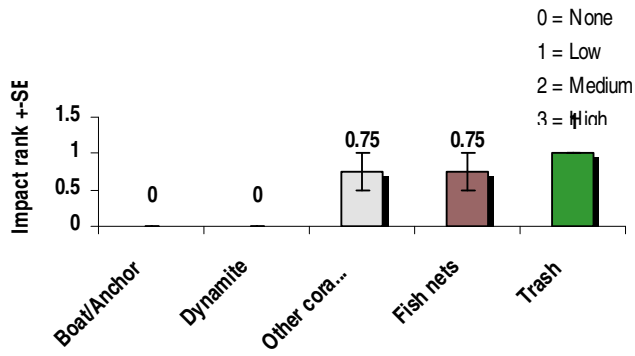




Mean Abundance Of Invertebrates For Site 3



Incidence Of Impacts For Site 3



Site 4

Location of site 4

28 April 2007

2-2.5m

Moon Island

Collected but still to be collated.

Site 5

Not done yet, the latter dives were cancelled due to legal worries by the College Board regarding safety. These have now been resolved and we hope to monitor this site in early September 2007.

References

Crawford, B. (2006, Nov) Dynamite Fishing detector to be tested, South China Morning Post.

Hodgson, G., Kiene, W., Mihaly, J., Liebler, J., Shuman, C., and Maun, L. (Feb 2004) *Reef Check Instruction Manual: A Guide to Reef Check Coral Reef Monitoring* Published by Reef Check, Institute of the Environment, University of California at Los Angeles.

Woodman, G. (1999) Preliminary analysis of the Hoi Ha Wan mapping programme, www.lpcuwc.edu.hk/en/qc/qc_coral.php

Appendix 1 - Example of **buddy data sheet** which is photocopied onto waterproof paper.

Site name:

Depth:

Segment (1, 2, 3, 4)

Date:

Buddies

Substrate Code

- HC** hard coral
- NIA** nutrient indicator algae
- RB** rubble
- OT** other

- SC** soft coral
- SP** sponge
- SD** sand

- RKC** recently killed coral
- RC** rock
- SI** silt/clay

HC hard coral	Porites	POR
	Goniopera	GON
	Acropora	ACR
	Millepora	MIL
	Fungia	FUN
	Favia	FAV
	Favites (shared)	FAT
	Pocillopora	

SUBSTRATE

0	10
0.5	10.5
1	11
1.5	11.5
2	12
2.5	12.5
3	13
3.5	13.5
4	14
4.5	14.5
5	15
5.5	15.5
6	16
6.5	16.5
7	17
7.5	17.5
8	18
8.5	18.5
9	19
9.5	19.5

Fish

- Butterflyfish**
- Sweetlips** (Haemulidae)
- Snapper** (Lutjanidae)
- Barramundi cod** (*Cromileptes*)
- Other grouper** (count **ONLY >30cm***)
- Humphead wrasse**
- Bumphead parrot**
- Other parrotfish** (count **ONLY >20cm**)
- Moray eel**

Invertebrates

- Banded coral shrimp**
- Diadema urchins**
- Pencil urchin**
- Sea cucumber** (edible only)
- Crown-of-thorns starfish**
- Giant clam** (*Tridacna*)
- Triton** (*Charonia tritonis*)
- Collector urchin** (*Tripneustes*)
- Lobster**

Coral Damage/Disease/Bleaching and Trash

Rate the following as: None=0, Low=1, Medium=2, High=3

- Coral damage: Boat/Anchor
- Coral damage: Dynamite
- Coral damage: Other
- Trash: Fish nets
- Trash: General
- Bleaching (% of coral population)
- Bleaching (% of colony)
- Please fill in the following*
- Grouper sizes (cm) **ONLY >30cm**
- Coral Disease (Yes/No and %):
- Rare animals sighted (type/#):

APPENDIX 2

Dynamite fishing detector to be tested.

South China Morning Post, November, 2006.

Barclay Crawford.

A Hong Kong physicist has developed the world's first system for detecting dynamite fishing, which environmentalists and the United Nations believe could lead to a crackdown on the practice.

George Woodman, director of the charitable organisation Teng Hoi (Listen to the Ocean), will begin testing the system at the WWF's Hoi Ha Wan Marine Life centre in Sai Kung today. Divers from the Coral Monitoring Group at Li Po Chin United World College will install the detector at the site.

The system uses underwater microphones, called hydrophones, linked to sophisticated computer software that detects the specific pitch explosions make in the water. The device can detect explosions up to 100km from the site using sonar technology.

The United Nations Environmental Programme is backing the new technology and has promised US\$210,000 funding.

Dr. Woodman said dynamite fishing was still carried out in the waters around Hong Kong and was widespread throughout Southeast Asia, particularly in remote areas that were difficult to monitor. Even if patrol boats intercepted a suspicious boat, the criminals would dump the explosives over the side of the boat to avoid being prosecuted.

Abdul Rahman Ridzwan, from the University of Malaysia, and Hong Kong University of Science and Technology scientists have also helped to develop the technology.

Dr. Woodman has been working on it since a 1994 trip to Sabah in Malaysia, where he was told authorities were powerless to stop poachers turning beautiful reefs into rubble. "These pristine reefs are being bombed out of existence across this region," he said