



The Swire Institute of Marine Science

太古海洋科學研究所



Annual Report

2004



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Honorary Director's Foreword



Welcoming guests to the reopening ceremony

This is the first annual report from the Swire Institute of Marine Science (SWIMS) since its reopening on 3rd December 2003. The present report encompasses not just the last year since the reopening, but also the period from July 2003 when we actually moved back into SWIMS. The renovation and reopening of SWIMS heralded a new era, and SWIMS now boasts the most modern and up-to-date aquarium and laboratory facilities, as well as improved accommodation and seminar facilities.

This period has also seen a change in research personnel at SWIMS. Professor Morton has retired and I have taken over as the Honorary Director. Joining the permanent academic staff are Drs. Kenny Leung and Cynthia Yau, who bring new ideas and expertise to SWIMS. Drs. Ji-Dong Gu and Yvonne Sadovy continue their links as part-time scientists. Drs. Benny Chan, Andy Cornish and Priscilla Leung have all held positions at SWIMS over the last year and we now welcome back Drs. Liu Min and

Wai Tak Cheung. SWIMS still has a dedicated team of support staff, who have worked incredibly hard to make the reopening run as smoothly as possible. Postgraduate numbers have also picked up since the renovation and, by December 2004, the majority of our bench spaces will be occupied.

The basic research ethos of SWIMS, however, remains the same: to train young scientists to produce research of international importance. As can be seen from our research outputs, we are achieving this goal. Within SWIMS, however, we are developing a more directed research portfolio, focusing our efforts on the behavioural and ecophysiological responses of marine organisms to environmental and anthropogenic stresses. This area encompasses the research interests of each staff member and by combining our skills we aim to establish SWIMS as an internationally important research centre in this field. Given SWIMS' unique situation, within the tropics in SE Asia and located on the shores of a protected Reserve, we are in an excellent position to undertake this form of research and, as a result, attract collaborators from around the globe. We plan to strengthen these links, bringing in experts to collaborate with staff and most importantly with local students in the new year.

This has been a year of great change at SWIMS and, thanks to the hard work of all the staff and students, a very successful year. We are now in a position, given the renovation and the influx of new students, to look forward to a very dynamic and productive 2005.

Best wishes for 2005 from the staff and students of SWIMS.

Gray A Williams



The newly renovated Swire Institute of Marine Science

Reopening and Renovation

After nearly 14 years of operation, facilities at SWIMS were showing signs of age and not well suited to the rigours of modern marine biology. In recognition of this, The Swire Group of companies again generously donated funds, which were matched by The University of Hong Kong, to undertake an extensive renovation over the summer of 2003.

The renovation concentrated on the ground floor laboratory and aquarium. These areas were gutted and new facilities, better suited to experimental biology, were fitted. The laboratory was divided into specific research areas, allowing dedicated areas for analytical and molecular work to be removed from the main laboratory, and also a rationalization of the balance and chemical store areas. The aquarium underwent the most extensive refurbishment based on a consultant's report, advising on methods to improve sea water quality, which had been a constant problem. Together with upgraded seawater, the interior of the aquarium was ripped out and the fixed ceramic tile tanks replaced with a totally flexible "plug-and-play" system, which allows researchers to design their own tank configurations. Three dedicated, smaller areas were also incorporated in the aquarium so that more controlled experiments can be performed without disturbance.

The renovation also allowed a number of other improvements to be made, such as the vital connection of the Residence and Institute to mains water supply – alleviating the need for water rationing in winter; connection of the Residence rooms and Institute to Broadband internet access; new windows and a rain canopy in the Residence; plus rationalization of the seminar room and Museum. All in all, SWIMS is now the most modern and well equipped marine laboratory in Hong Kong and we can look forward to the next few years' research in superb facilities.

To celebrate this renovation, a small reopening ceremony was held on 3rd December 2003. Officiating were James Hughes-Hallett, Chairman of The Swire Group and Prof. Tsui Lap-Chee, Vice Chancellor of The University of Hong Kong. A variety of other guests joined the celebrations including Andy Herdman, Michael Bell and Davy Ho from The Swire Group of companies. The theme of the celebration was recognition of the importance of research into Hong Kong's marine environment, which has long been shared by the Swire family and The University of Hong Kong. As such, the affair was quite informal with brief speeches from Gray Williams, as Honorary Director, James Hughes-Hallett and Prof. Tsui followed by the cutting of a roast pig, which was then enjoyed by all staff, students and friends at SWIMS.



James Hughes-Hallett and Prof. Tsui Lap-Chee cut the roast pig



Cynthia Yau shows James Hughes-Hallett how cuttlefish feed



Prof. Tsui Lap-Chee studying an octopus

Staff Research

Gray A Williams



Field work at Cape d'Aguilar

One of the main foci of my research is how animal behaviour impacts on community structure. By understanding the factors that determine when animals move and where they go it may be possible to predict their predation/grazer impact and, therefore, how this ultimately controls rocky shore community structure. Many factors affect these two simple measurements, including endogenous (internal) and exogenous (external) factors.

To try and understand these, my students and I have been investigating behavioural patterns of different rocky shore molluscs, both predators and herbivores, to ascertain whether there are any general patterns which will help explain variation seen in predation and grazing pressure. We do this using a variety of techniques including intensive shore-based observations, on-shore video and also controlled laboratory experiments. This research has

been going on for some years and has included colleagues in South Africa, Italy and the UK and also projects based in Hong Kong and Ireland. What is becoming clear is that most species have set behavioural patterns which are endogenously controlled (usually with a tidal component). This pattern is, however, overridden by external factors such as weather and site specific differences which results in small scale, day to day, and place to place, variation in these patterns.

Cynthia Yau



Octopus hunting at night

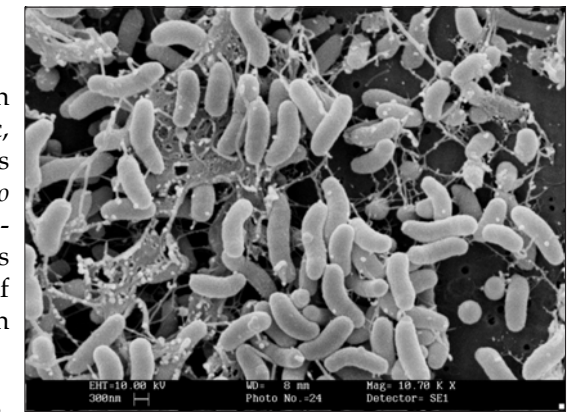
My principal research interests concern the biology of fisheries resources, in particular, the cephalopods (i.e. octopus, cuttlefish and squid). The cephalopods are the most highly developed of the invertebrates, exhibiting complex behaviours and learning capabilities, and they are voracious predators that play a key role in marine ecosystems. Moreover, cephalopods constitute a high-value component of the commercial catch from the South China Sea. Despite this, there is a paucity of information on the biology and ecology of local species.

I am currently in the process of updating the species checklist of cephalopods from Hong Kong and the South China Sea (in collaboration with the Chinese University of Hong Kong and the University of Xiamen) in order to address the most fundamental of questions: "what species are found here?" Unfortunately, the

systematics of cephalopods from this region is in a state of confusion and morphological characters alone have proven insufficient to distinguish between some species. To resolve this, phylogenetic studies using molecular techniques are being conducted to elucidate their taxonomy, while concurrent rearing studies will be undertaken at SWIMS to obtain information on the early life history stages, growth, and reproductive biology of local species. In addition, my research group investigates the ecology and population dynamics of commercially exploited squid and cuttlefish species in Hong Kong waters. From the outcomes of such research, not only we will gain a better understanding of the status of cephalopod stocks and the effects of fishing on their populations, but we will also acquire a privileged glimpse into the lives of these fascinating creatures.

Ji-Dong Gu

One of the research projects in my laboratory has been to gain an understanding of the new emerging, potentially pathogenic, bacteria found in our environment. Our major effort has centered on pollution issues at Mai Po Nature Reserve. *Vibrio* species were chosen for study as they are important disease-causing agents in aquatic environments and also infect humans in tropical and subtropical regions. Environmental strains of *Vibrio* species have been isolated for investigation from both Mai Po Nature Reserve and Cape d'Aguilar.



Scanning Electron Micrograph of *Vibrio* species

Among the isolates, three were confirmed as *Vibrio cholerae* MP-1, *Vibrio estuariensis* MP-2 and *Vibrio vulnificus* MP-3 based on 16S rDNA sequences. All three isolates showed distinctive responses to environmental parameters such as inhibition of *V. cholerae* MP-1 at 15°C. Among them, *V. cholerae* MP-1 was surprisingly tolerant to a high concentration of vibriostatic agent O/129 at 40 µg/ml, which is a key chemical for differentiating *Vibrio* from closely related species. All three isolates were also strongly resistant to a suite of antibiotics, which has an important implication because of the mobility of genes in the environment. Most interestingly, a naturally occurring plasmid was detected and isolated from *V. cholerae* MP-1 while no plasmid was detected in the other two isolates. This plasmid, designated as pVC, has 3,806 base pairs and its full sequence has been deposited in GenBank. Since no observable phenotypic characteristic has been identified for this small, cryptic plasmid, current investigation is on the function of the plasmid in the host bacteria. This study has clearly shown that Mai Po Nature Reserve harbours some unique bacterial species with unknown biological characteristics, and further investigation of their microbial ecology and plasmid biology is the focus of our future work.

Kenny Leung

Along the coasts of South-East Asia, over-population and large-scale development continue to threaten the marine environment. The environmental impacts associated with the over-supply of nutrients and man-made toxic chemicals are probably worsening, and pose significant ecological and public health risks. My research is dedicated to diagnosing the health of marine ecosystems using biomonitors and biological markers, and to developing reliable methods for assessing and predicting the ecological risks caused by industrial chemicals, dredging and large-scale marine construction. Over the last two years, I have conducted consultancy studies for the Government to evaluate the suitability of various biological markers for monitoring marine pollution, and to assess the ecological risks of coastal development projects on oysters.



Kenny Leung measuring oxygen consumption in bivalves

As one of the busiest ports in the world, there is also an invisible problem in Hong Kong waters – contamination by toxic antifouling chemicals. The hulls of marine vessels are often painted with toxic compounds to prevent fouling, chemicals that can leach into the water column and can affect the health and reproduction of coastal organisms. Organotin compounds have been used since 1970, but are highly toxic to marine life and were banned in 2004 by the International Maritime Organisation. Many new antifouling compounds have been developed recently, however, their potential impacts on marine ecosystems are still largely unknown. In order to safeguard our marine resources, my research students and I are currently investigating the toxic effects and ecological risks of this new-generation of antifouling compounds on local marine organisms.

Andy Cornish



Newly hatched bamboo shark

Although sharks are feared in Hong Kong following a series of attacks on humans in the mid 1990's, only one species is resident here, the harmless white-spotted bamboo shark (*Chiloscyllium plagiosum*), a small, bottom-dwelling species. Little is known about this shark, and I have been studying its diet and reproductive biology in order to better understand how it is able to survive the intense fishing pressure in local waters.

Initial results suggest that white-spotted bamboo sharks lay their egg capsules, containing a single fertilized egg, around May and June. The embryos hatch as fully developed young after 50-70 days and we have been able to raise 17 juveniles at SWIMS. Ongoing research with Yvonne Sadovy will reveal the age of maturity and fecundity for comparison with other elasmobranchs. Analysis of stomach contents has already shown that the species is a generalist predator, taking small fishes, shrimps, squid and polychaete worms. Collaborative studies with Kenny Leung at SWIMS and Paul Lam of City University investigate how metal and organic pollutants from prey items accumulate within this top benthic predator, and whether concentrations are high enough to be toxic to the shark, or humans that eat them.

Yvonne Sadovy



Humphead wrasse in a local restaurant tank

Fisheries are globally important, not only for food but also for livelihoods. Yet, in the last decade, more and more have shown clear evidence of declines, marine ecosystems have changed, diversity has decreased and fisheries are collapsing. Hong Kong's fishery and marine ecosystem are no exception, with serious catch declines and threats to biodiversity.

My research and that of my students strives to bridge the gulf between preserving biological diversity and working towards sustainable use. We work both locally and within a regional context that is relevant to Hong Kong, where we seek to understand the biology of commercially valuable local fish species through detailed laboratory and field-based experiments. We also use the experience of local fishermen to better understand the current status and exploitation history of Hong Kong's commercial fishing sector, once a major player in the local economy. Regionally, our work examines the valuable live reef food-fish trade, and helped to establish Hong Kong's marine ecological footprint of seafood consumption in the wider Indo-Pacific. We also work closely with government and local NGOs. A significant recent achievement, made possible largely from the work in our Fish Lab, has been a CITES Appendix II listing of the humphead wrasse ("So Mei"), *Cheilinus undulatus*, which will help to ensure the conservation and sustainable use of this magnificent species.

Benny KK Chan



Burrowing crabs and shrimps on sandy shores

My research interests lie in supply-side ecology, population ecology and the biology of crustaceans, particularly barnacles. My early research on the intertidal environment focused on the basic ecology of the acorn barnacles, *Tetraclita squamosa* and *T. japonica*, which are the major space occupiers on rocky shores. This included adult and larval morphologies, population dynamics and the factors affecting their post-settlement mortality. This research has subsequently expanded within the Asian region through studies into the effect of latitudinal gradients on the vertical and horizontal distribution patterns and larval supply of *Tetraclita* spp. from Japan and Taiwan to Hong Kong. Besides research on rocky shores, I also work on the population ecology and burrow morphology (using resin casting techniques) of sandy shore crustaceans including the mud shrimps *Austinopecten edulis*, ghost crabs *Ocypode* spp. and fiddler crabs, *Uca* spp.

Postgraduate Research

Habitat use by an intertidal blenny

One of the most common fishes around exposed rocky shores in Hong Kong is the stellar rockskipper, *Entomacrodus stellifer lighti*. During her M.Phil studies, Karen Qiu looked at how this important grazer utilizes space by following individuals in the Cape d' Aguilar Marine Reserve. Individuals were tagged by injecting acrylic paint under the skin of the fish, and then released back to the site where they were caught. These fish were later tracked while snorkeling and their positions recorded on a map. Karen showed that 22% of tagged individuals had defined home ranges with an area between 13 - 84 m² and that there was much overlap between individuals. The maximum horizontal distance each fish moved along the shore ranged from 4 - 22 m, and movement tended to be towards more exposed shores. Karen suggested this was possibly associated with increased availability of food and/or nesting sites for the fish in such areas.



Stellar rockskipper

Surviving heat stress on rocky shores

It has been suggested that induction of heat shock proteins (Hsps) can enhance thermal tolerance and reduce damage from heat stress in animals at both cellular and organismal levels. Intertidal organisms face an extremely dynamic environmental regime, where physical factors like temperature and desiccation extremes have long been established as factors limiting their distribution. However, relatively few studies have investigated the importance of physiological/molecular factors. Lai Chien-Houng is researching the kinetics of Hsp synthesis in two common intertidal limpets: *Cellana grata* and *C. toreuma* to evaluate the temporal profile of this molecular response to heat stress. Currently he is establishing the responsiveness and magnitude of Hsp synthesis for the two limpet species after a heat shock event, but ultimately Chien-Houng hopes to be able to infer the importance of Hsp synthesis in establishing habitat partitioning between different species in the intertidal zone.



Limpet "mushrooming" in response to heat stress

Activity patterns and rhythmicity in foraging chitons

Jasmine Ng is currently researching foraging behaviour in the intertidal chiton, *Acanthopleura japonica*. This mollusc is well-suited for life on the rocky shore, being an efficient grazer, highly desiccation-tolerant, and capable of excavating both encrusting algae and the microalgal biofilm for food. However, little is known of its foraging behaviour, especially in relation to its rhythmic patterns and temporal organization of activity. Incorporating both *in situ* observations and laboratory experiments, Jasmine is investigating the activity patterns and rhythmicity of three sub-populations (high-, mid- and low-shore) of *A. japonica*, in different seasons and tidal regimes. Jasmine hopes the findings from her study will elucidate the factors affecting activity patterns and behavioural rhythms of intertidal molluscs, increasing our understanding of the importance of individual variability within larger scale patterns.



Jasmine following her chitons during summer

Predicting grazing pressure by a common limpet



Avis monitoring limpet movement on the shores at Cape d'Aguilar

In an attempt to predict the distribution of grazing pressure exerted by the rocky shore limpet, *Cellana grata*, Avis Ngan is using data collected from the field and laboratory in conjunction with computer modelling. *C. grata* is the dominant grazer in the mid to high intertidal in Hong Kong and has been shown to limit the growth of biofilm where it feeds. The life-history of this species is functionally linked to the availability of food, showing a bottom-up effect, where the resource impacts consumer populations. Avis's project builds on previous studies by investigating the top-down effects that the consumers have on their resource. This involves studying the rules governing the organisation of limpet foraging in time and space. Computer simulation can then be applied to these rules to predict limpet foraging given different environmental parameters. Avis's ultimate aim is to develop a predictive tool

and a mechanistic understanding of the relationship between *C. grata* and the biofilm on which it feeds, and he is currently collaborating with colleagues in Firenze University, Italy to achieve this goal.

Mantis shrimp research in southern China



Karen measuring the length of stomatopods for population studies

Research into stomatopods (mantis shrimps) carried out by Karen Lui focuses on the ecology of four abundant and commercially important species in Hong Kong. Specimens are collected monthly using a commercial shrimp trawler, in both eastern and western waters of Hong Kong, where hydrographic conditions are quite different. Karen is measuring the shrimps' population structure, growth and reproductive cycles. The genome identity of the two most widely distributed stomatopods in the waters around southern China is one of her main foci, using molecular techniques (mtDNA sequencing) to elucidate the species' migratory patterns. The role of stomatopods in controlling benthic community structure is also being studied through sexual and temporal variation in their diets.

The results of Karen's work will provide substantial information on the four stomatopod stocks in southern China, enabling sustainable management of their fisheries in this heavily exploited region.

Factors influencing the distribution of coralline algae



Low-shore rock pools at Cape d'Aguilar

Wai Tak-Cheung has recently completed his postgraduate research into herbivore-induced effects and persistence of non-geniculate coralline algae in low-shore rock pools. Crustose coralline algae (CCA) are the dominant algal group all year round in low-shore rock pools within the Cape d'Aguilar Marine Reserve. Although their distribution is seasonally stable, their relative abundance varies seasonally among, and within, pools. Wai investigated the effects of grazers, individual pool and seasonal availability of bare surfaces on the algal colonization of artificial plates in the rock pools. Similar to other coralline dominated habitats, the establishment and persistence of CCA in the pools was maintained by frequent disturbance. Disturbance

in the form of herbivore grazing interacted with high temperatures and/or reduction in salinity in summer to initiate algal colonization. Whilst grazing was the primary structuring force in these pools, physical disturbance was more important during summer when heat stress caused bleaching of the CCA. Wai's research also showed the important role that sea urchins play, through their grazing, in maintaining benthic community structure in the Reserve.

Larval supply and survival of acorn barnacles



Damgy fixing plankton traps onto the shore

Damgy Chan investigates the supply-side ecology and population genetics of *Tetraclita* barnacles on Hong Kong rocky shores. Supply-side ecology refers to events including larval supply and dispersal, patterns of settlement and post-settlement mortality that are critical in shaping adult populations. Damgy uses plankton traps to quantify larval supply by collecting cyprids (barnacle larvae) on four shores across Hong Kong. Dispersal range of the larvae is determined by comparing genetic makeup (using Amplified Fragment Link Polymorphism profiles and mtDNA sequences) of larvae arriving on Hong Kong shores to those of adult populations in surrounding areas of southern China. Damgy conducts this part of her work under the supervision of Prof. KH Chu at Chinese University. Damgy is also investigating post-settlement mortality by comparing the genes of *Tetraclita* cyprids, settlers, and adults on Hong Kong shores.

Part-time researchers at SWIMS

As their field sites or the specific equipment they need is far from SWIMS, a number of postgraduate students use SWIMS as their temporary research base during their studies. David Poon and Janet Lee work on the foraging behaviour of crabs on mangrove and sandy shores, respectively, in the New Territories. Janet focuses on the drove forming soldier crabs, documenting the sexual variation in their behaviour with tidal level of the population at Starfish Bay; whilst David has just completed his studies investigating the population biology and diet of two species of mangrove crab, *Metapograpsus* and *Perisesarma*. Ariel



Shirley scoring predation intensity of *Thais clavigera*



The soldier crab, *Mictyris longicarpus*

Tan monitoring the foraging of *Nerita* and the resultant patterns of community structure, whereas Shirley has just submitted her thesis which investigated variation in the predation intensity of the whelk, *Thais clavigera* at Tai Tam. Valerie Ho also works at SWIMS, being part of the team that regularly collects trawl samples in western and eastern Hong Kong waters. Valerie works on two flathead fish species, studying their population dynamics and sex change.



David Poon, Valerie Ho, Shirley Chow, Damgy Chan and Ariel Yeung

PRIMER Workshop

In June 2004, SWIMS hosted a training workshop, led by Dr. Bob Clarke on the "Analysis of Multivariate Data from Ecology and Environmental Science", using PRIMER v5. PRIMER is a statistical package developed by Bob, designed to deal with the often complex multivariate data sets that ecologists and consultants generate when trying to describe natural communities.

The workshop was very popular and reached its maximum size of 30 participants, including colleagues from the National Institute of Education, Singapore; South China Sea Institute of Oceanology, Guangzhou; Chinese and City



Ariel Yeung discussing his data with Bob Clarke

Universities in Hong Kong; the Agriculture, Fisheries and Conservation Department and the Environmental Protection Department, the Hong Kong Government; and staff and students of the Department of Ecology & Biodiversity. For 4 days Bob guided the participants through the complexities of Cluster Analysis, Multi-Dimensional Scaling, ANOSIM and other forms of multivariate analysis. It was illuminating to listen to Bob explain how the statistics worked, how they should be applied and the possible pitfalls of their use. All the participants quickly warmed to the tasks and started discussing how these methods could be applied to their own data, many of which were used as examples, as well as sharing problems experienced when collecting and analyzing such data.



Participants working in the seminar room

The great success of this workshop will probably be evident in the next year or so when publications from workshop attendees, using these forms of analysis, will start to appear in the literature. Due to the success of the workshop, and further expressions of interest to attend, we plan to run another workshop in 2-3 years' time.



Participants of the PRIMER Workshop held at SWIMS in June 2004

Research Visitors and Seminars

Throughout the course of the year we have had a number of academic visitors to SWIMS, either to work at the Institute, give seminars, or discuss future collaborations. Melissa Frey (University of California Davis, USA) was the first visitor to give a talk in the newly renovated seminar room. She worked with Ariel Yeung, collecting local species of *Nerita* as part of her research into species divergence of this group. In June 2004, Drs. Peter Marko and Amy Moran (University of North Carolina, USA) stayed at SWIMS to research the bivalve family known as the Ark shells. Also in June, Prof. Jens Høeg (University of Copenhagen, Denmark) worked with Benny Chan on the ecology and phylogeny of the stalked barnacle *Ibla cumingi*, and also gave a research seminar at the Department of Ecology & Biodiversity.



Melissa Frey and postgraduates following her seminar

A number of researchers have given seminars to staff and students at SWIMS during their visits. Profs. David Wethey and Sarah Woodin (University of South Carolina, USA) presented their research on thermal stress on intertidal barnacles and soft shore interactions, respectively. David also initiated a small collaborative project, looking at thermal profiles on local shores which can be integrated into the general models he is developing. Dr. Louis Gosselin (Cariboo University, Canada) revisited SWIMS after a gap of five years and gave a seminar on mortality of juvenile invertebrates in the intertidal zone. In August, Dr. Maurizio de Pirro (Firenze University, Italy) returned to SWIMS to continue links between our institutions. Maui and Prof. Guido Chelazzi maintain a regular research exchange with SWIMS staff and students and on this trip Maui helped establish a heart monitoring system for invertebrates which Avis Ngan and Chien-Houng Lai will use in their research. Andrew Powell (Canford School, UK) stayed at SWIMS to develop teaching materials and also to visit his past student, Chow Wing Ying, who was working at SWIMS as a summer helper.

A number of scientists visited SWIMS to plan future research collaborations. Prof. Christopher McQuaid (Rhodes University, S. Africa) visited to discuss a project on thermal tolerance in intertidal mussels, and Prof. Brian McMahon (Calgary University, Canada) to plan a workshop on physiological stress to be held at SWIMS in summer 2005.

Community Outreach

We have played host to a variety of visitors, including HKU Alumni, World Wide Fund for Nature Hong Kong, Outreach Hong Kong, Young Ambassadors and especially secondary school groups. Visits have mainly focused on the importance of marine conservation and Hong Kong's rich biodiversity. Visitors tour the laboratory, visit the shores and then can get first hand experience of some of the common, local organisms in the aquarium.

We have hosted a number of different secondary school groups at SWIMS, where they attend seminars and also conduct fieldwork based on their curricula. These students are always excited to visit SWIMS, and see the research that is going on at the Institute. They are particularly thrilled to see marine organisms in their natural habitats and also to be able to pick them up and examine them close-up in our aquarium. A visit to SWIMS therefore combines the serious study of aspects of the students' curricula but also the fun of discovery! Many of the students are also unaware of the Marine Reserve and so these trips highlight the importance of marine conservation. We hope that such visits will encourage young people to respect the marine environment and may inspire some of these students to study environmental science at The University of Hong Kong.



M.Sc students conducting transect work as part of their Environmental Management course



South Island School students gaining work experience

Some schools send older students to SWIMS for work experience. Jennifer Champion and Eleanor Taylor from South Island School, and Matthew Travers of West Island School, conducted their work experience at SWIMS in 2003, and Simon Chui and Eri Kawamura also from South Island School, came to SWIMS in 2004. These work experience students spent their weeks helping postgraduates and staff conduct their research, and learning about the day-to-day running of a marine institute.

Every year SWIMS receives requests from overseas students wanting to gain summer research experience. This year was no exception and we were lucky to attract a number of highly motivated students to work on different projects. Nichola Fletcher (Hull University, UK) stayed at SWIMS for two months and, together with Gabrielle Chan (a first year undergraduate at Oxford University) and Chow Wing Ying (Canford School and now starting her first year at Cambridge University), helped students on a variety of projects from monitoring limpet movement and sieving sediment samples, to computer data entry. Some of our undergraduate students also worked at SWIMS, helping members of staff with their specific research projects. Karen Chan worked with Benny Chan rearing barnacle larvae and Eva Cheuk assisted Cynthia Yau in her cephalopod research. Melody Cheng and Kevin Kwok helped Kenny Leung in collecting copepods and mosquitoes for ecotoxicological studies.



B.Sc students boarding the Boston Whaler for field work

SWIMS was also host to Science Faculty interns, school students who want to gain experience prior to University entry. Leung Cheuk Man, Philip of Helen Liang Memorial Secondary School worked on a small project investigating the burrow architecture of ghost crabs at Big Wave Bay. This was part of the Science Summer Research Programme 2004 - organized by the Faculty of Science at HKU and the Education and Manpower Bureau.

Undergraduate students at HKU have also benefited from the facilities available at SWIMS. In the Biological Oceanography course, the students enjoyed boat-based fieldwork on board the Boston Whaler where they learned first-hand about hydrographical surveying techniques. Students studying the Coastal Ecology course also carried out their projects and attended a special conference at SWIMS where they presented their results. SWIMS also hosted postgraduate students in the M.Sc course in Environmental Management, who came to SWIMS to learn field-based sampling techniques. Students from the Earth Science Department used SWIMS as their research base, staying at the Residence whilst they surveyed the geology of the Cape d'Aguiar peninsula. This year has also seen SWIMS in the news, with articles on SWIMS appearing in Ming Pao, South China Morning Post, and Hong Kong Magazine as well as being featured in the Pearl Report (TVB).



Philip Leung digging out a crab burrow



Secondary school students learning field techniques



Environmental Life Science students sampling plankton

SWIMS and the MBAHK

SWIMS staff and students are heavily involved in The Marine Biological Association of Hong Kong (MBAHK). Gray Williams is the Vice Chairman of the society and Kenny Leung is the Librarian, maintaining the MBAHK library at SWIMS with the help of Sylvia Yiu. On 20th March, the Association and SWIMS hosted an alumni and members gathering which over 65 marine biologists and SWIMS alumni attended. There was a short tour of the facilities followed by a BBQ at the residence where Dr. Paul Shin, the Chairman of the MBAHK, gave a short speech.



SWIMS past and present students and staff enjoy a BBQ with MBAHK members

SWIMS and the World Wide Fund For Nature Hong Kong

The World Wide Fund For Nature Hong Kong has recently refocused its attentions to the marine environment and has enlisted the expertise of SWIMS staff in guiding policy and executing specific projects. Andy Cornish is a member of the Conservation Projects Committee, Yvonne Sadovy is the Chair, and both sit on the Marine Sub-Committee with Cynthia Yau and Gray Williams.

SWIMS, Big Fish Count and ReefCheck

Following the popularity of the long-established Big Bird Race, WWF HK and Andy Cornish devised a marine equivalent to stimulate interest in Hong Kong's reef fish diversity, the Big Fish Count. Teams of divers competed in the inaugural event on 20th June 2004, recording as many fish species as possible. The "HKU Diving Team", consisting mostly of Ecology & Biodiversity undergraduates and led by Kenny Leung, were the overall winners, recording 90 species from 3 sites in Sai Kung.



The winning Big Fish Count Team

ReefCheck is a global monitoring programme to monitor coral reefs using volunteer divers trained in ReefCheck survey techniques. Teams led by Andy Cornish and Kenny Leung monitored corals, fishes and invertebrates at two coral communities in Hong Kong's eastern waters in 2003 and 2004.

SWIMS and AFCD

Staff and students at SWIMS continue to work with the Agriculture, Fisheries and Conservation Department (AFCD). SWIMS is based within Hong Kong's only Marine Reserve, and any research in this area is conducted under a permit issued by AFCD. As a result we cooperate closely with AFCD and all our researchers are registered. We also act as informal watchdogs, reporting illegal fishing activities and collaborating with AFCD by providing residential facilities for overnight watches. On 12th July 2004, a small oil spill impacted the Reserve and staff from SWIMS and AFCD worked



Fishing boats illegally enter the Reserve to collect sea urchins

together to rapidly clean up the spill and prevent further damage.



Dr. Ivan Chan and AFCD staff working with students and staff to remove an oil spill

Research Opportunities

Research visitors

The Swire Institute of Marine Science offers three main sources of funding to support researchers wanting to visit SWIMS to undertake research. For enquiries, please contact the Hon. Director, Gray A Williams.

The Laurence Caplin Scholarship in Marine Biology

Established in memory of Laurence Caplin by his widow, Mrs. E Caplin and daughter, Mrs. J Woodward, to bring young people to SWIMS to undertake research in marine biology with a resident staff member.

The Intertidal Trust Fund

Established in 1982 with profits from the book "The Seashore Ecology of Hong Kong", grants from the Intertidal Trust Fund can be made to overseas students and scientists who wish to undertake research on intertidal ecology at SWIMS.

Cape d'Aguilar Trust Fund

Established in 1995 with profits from the book "An Introduction to the Cape d'Aguilar Marine Reserve, Hong Kong", grants from the Cape d'Aguilar Trust Fund can be made to local and overseas students and scientists who wish to undertake marine biological research on the Cape d'Aguilar Marine Reserve at SWIMS.

Pacific Institutes of Marine Science

SWIMS is also a founding member of the Pacific Institutes of Marine Science and Gray A Williams sits on the committee of their Fellowship Exchange Scheme.

Higher Degrees (M.Phil/Ph.D)

Students who are interested in undertaking a research postgraduate degree (M.Phil or Ph.D) in marine biology and ecology should directly contact SWIMS academic staff for more information regarding individual projects.

Student Research Assistantships

Undergraduate students are encouraged to apply to work as volunteer student research assistants during the semester break/summer holidays. High school students who would like to gain some experience in marine biological/ecological research are also encouraged. Interested students should contact Ms. Sylvia Yiu.

Accommodation

Accommodation at the Residence is available for students, researchers and visitors working at the institute. It is also available to outside visitors who wish to enjoy the scenic serenity Cape d'Aguilar has to offer. It is an ideal retreat from the city on weekdays and makes a perfect getaway for quiet weekends.

SWIMS residential blocks are situated on the top of Cape d'Aguilar cliffs, offering magnificent sea views of the southern islands of Po Toi and Waglan, and west, behind the residence, where there are steep dramatic cliffs and views of Shek O.

Those interested in booking the accommodation, please contact Ms. Sylvia Yiu.



Residential block overlooking the Marine Reserve

Chan BKK (2003) Studies on *Tetraclita squamosa* and *Tetraclita japonica* (Cirripedia: Thoracica) II: larval morphology and development. *Journal of Crustacean Biology* 23: 522-547

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Chan BKK, Chan WKS, Walker G (2003) Seasonal biofilm successional patterns at a sheltered shore in Hong Kong. *Biofouling* 19: 371-380

Chan BKK, Williams GA (2003) The effect of physical stress and mollusc grazing on settlement, recruitment and vertical distribution of *Tetraclita squamosa* and *Tetraclita japonica* (Cirripedia: Balanomorpha) in Hong Kong. *Journal of Experimental Marine Biology and Ecology* 284: 1-23

Chan K, Morton B (2003) The effects of organotin pollution on *Nassarius festivus* (Powys, 1835) (Gastropoda: Nassariidae) in Hong Kong. In: Morton B (ed) *Perspectives on Marine Environmental Change in Hong Kong and Southern China: 1977-2001*. Hong Kong University Press, Hong Kong, pp 557-580

Chan K, Morton B (2004) The population dynamics of *Nassarius festivus* (Gastropoda: Nassariidae) on three environmentally different beaches in Hong Kong. *Journal of Molluscan Studies* 70: 329-339

Chelazzi G, De Pirro M, Williams GA (2004) Different cardiac responses to copper in limpets from metal polluted and clean shores of Hong Kong. *Marine Environmental Research* 58: 83-93

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Cheung KH, Gu JD (2003) Reduction of chromate (CrO₄²⁻) by an enrichment consortium and an isolate of marine sulfate-reducing bacteria. *Chemosphere* 52: 1523-1529

Chiu HMC, Morton B (2003) The morphological differentiation of two horseshoe crab species, *Tachypleus tridentatus* and *Carcinoscorpius rotundicauda* (Xiphosura), in Hong Kong with a regional Asian comparison. *Journal of Natural History* 37: 2369-2382

Chiu HMC, Morton B (2003) The status of horseshoe crabs in Hong Kong. In: Morton B (ed) *Perspectives on Marine Environmental Change in Hong Kong and Southern China: 1977-2001*. Hong Kong University Press, Hong Kong, pp 743-758

Chiu HMC, Morton B (2004) The behaviour of juvenile horseshoe crabs, *Tachypleus tridentatus* (Xiphosura), on a nursery beach at Shui Hau Wan, Hong Kong. *Hydrobiologia* 523: 29-35

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Fan Y, Wang Y, Qian P, Gu JG (2004) Optimization of phthalic acid batch biodegradation and the use of modified Richards model for modeling degradation. *International Biodeterioration & Biodegradation* 53: 57-63

Gu JD (2003) Microbiological deterioration and degradation of synthetic polymeric materials: recent research advances. *International Biodeterioration & Biodegradation* 52: 69-91

Gu JD, Qiu W, Koenig A, Fan Y (2004) Removal of high NO₃ concentrations in saline water through autotrophic denitrification by the bacterium *Thiobacillus denitrificans* strain MP. *Water Science and Technology* 49: 105-112

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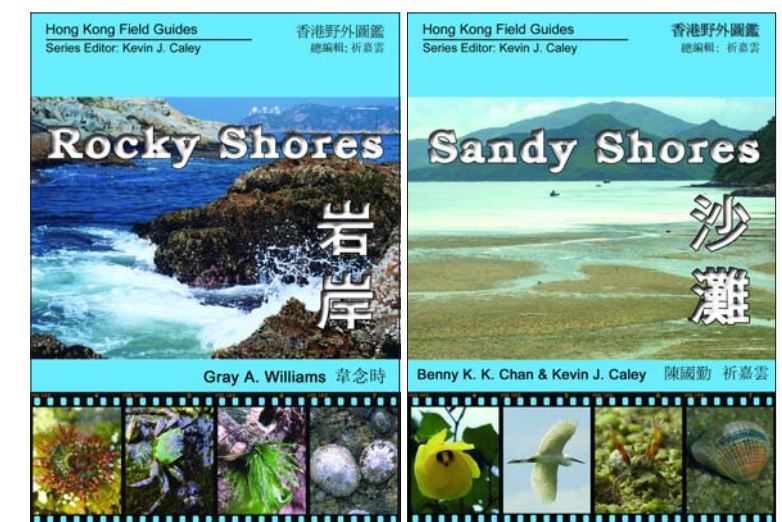
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- Leung KF, Hodgson PA (2003) The occurrence of seabed debris in Hong Kong: a comparison of changes between the 1995 and 2001 trawl surveys. In: Morton B (ed) *Perspectives on Marine Environmental Change in Hong Kong and Southern China: 1977-2001*. Hong Kong University Press, Hong Kong, pp 593-613
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- Leung KMY, Ibrahim H, Dewhurst RW, Morley NJ, Crane M, Lewis JW (2003) Concentrations of metallothionein-like proteins and heavy metals in the freshwater snail *Lymnaea stagnalis* exposed to different levels of waterborne cadmium. *Bulletin of Environmental Contamination and Toxicology* 71: 1084-1090
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- Morton B, Chan K (2003) The effects of organotin pollution on *Nassarius festivus* (Powys, 1835) In: Morton B (ed) (Gastropoda: Nassariidae) in Hong Kong. *Perspectives on Marine Environmental Change in Hong Kong and Southern China: 1977-2001*. Hong Kong University Press, Hong Kong, pp 555-578
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- Nicholson S, Szefer P (2003) Accumulation of metals in the soft tissues, byssus and shell of the mytilid mussel *Perna viridis* (Bivalvia: Mytilidae) from polluted and uncontaminated

- locations in Hong Kong coastal waters. *Marine Pollution Bulletin* 46: 1039-1043
- Tong YF, Lee SY, Morton B (2003) Effects of artificial defoliation on growth, reproduction and leaf chemistry of the mangrove *Kandelia candel*. *Journal of Tropical Ecology* 19: 397-406
- Wang Y, Fan Y, Gu JD (2003) Microbial degradation of the endocrine-disrupting chemicals phthalic acid and dimethyl phthalate ester under aerobic conditions. *Bulletin of Environmental Contamination and Toxicology* 71: 810-818
- Wang Y, Fan Y, Gu JD (2003) Aerobic degradation of phthalic acid by *Comamonas acidovorans* Fy-1 and dimethyl phthalate ester by two reconstituted consortia from sewage sludge at high concentrations. *World Journal of Microbiology & Biotechnology* 19: 811-815
- Wang Y, Fan Y, Gu JD (2004) Dimethyl phthalate ester degradation by two planktonic and immobilized bacterial consortia. *International Biodeterioration & Biodegradation* 53: 93-101
- Wang Y, Leung PC, Qian P, Gu JD (2004) Effects of UV, H₂O₂ and Fe³⁺ on the growth of four environmental isolates of *Aeromonas* and *Vibrio* species isolated from Mai Po Inner Deep Bay Nature Reserve Ramsar site of Hong Kong. *Microbes and the Environment* 19: 163-171
- Williams GA (2003) *Hong Kong Field Guides (1) Rocky Shores* (ed. Caley KJ) Wan Li Book Co., Hong Kong
- Wu A, Williams GA (2004) Clinical characteristics and pattern of skin test reactivities in patients with shellfish allergy. *Allergy and Asthma Proceedings* 25: 237-242
- Xu XR, Gu JD (2004) Elucidation of methyl tert-butyl ether degradation with Fe²⁺/H₂O₂ by purge-and-trap gas chromatography-mass spectrometry. *Microchemical Journal* 77: 71-77
- Xu XR, Zhao ZY, Li XY, Gu JD (2004) Chemical oxidative degradation of methyl tert-butyl ether in aqueous solution by Fenton's reagent. *Chemosphere* 55: 73-79
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- Xu, XR, Li HB, Li XY, Gu JD (2004) Reduction of hexavalent chromium by ascorbic acid in aqueous solutions. *Chemosphere* 57: 609-613
- Yan Y (2003) Larval development of the barnacle *Chinochthamalus scutelliformis* (Cirripedia: Chthamalidae) reared in the laboratory. *Journal of Crustacean Biology* 23: 513-521
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- Yang KY, Lee SY, Williams GA (2003) Selective feeding by the mudskipper (*Boleophthalmus pectinirostris*) on the microalgal assemblage of a tropical mudflat. *Marine Biology* 143: 245-256

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- Zhou H (2003) Temporal changes in a Hong Kong mangrove and adjacent foreshore sandflat meiofaunal communities. In: Morton B (ed) *Perspectives on Marine Environmental Change in Hong Kong and Southern China: 1977-2001*. Hong Kong University Press, Hong Kong, pp 459-473
- Zhou H, Morton B (2004) The diets of juvenile horseshoe crabs, *Tachypleus tridentatus* and *Carcinoscorpius rotundicauda* (Xiphosura), from nursery beaches proposed for conservation in Hong Kong. *Journal of Natural History* 38: 1915-1925



SWIMS staff authored two marine field guides aimed at undergraduates and secondary school students

Other Contributions from SWIMS

Academic Contributions

Ji-Dong Gu

Member of Editorial Boards: Biodegradation, International Biodeterioration & Biodegradation, Ecologic Science, Journal of Tropical Oceanography, Water and Wastewater, Chinese Journal of Applied Ecology

Kenny Leung

Member of Editorial Board: Integrated Environmental Assessment and Management

Yvonne Sadovy

Member of Editorial Boards: Conservation Biology, Fish & Fisheries, Reviews in Fish Biology and Fisheries
Chair of the IUCN Species Survival Commission Specialist Group for Groupers and Wrasses
Member of the IUCN CITES COP 13 delegation in Nov. 2004
Director of the Society for the Conservation of Reef Fish Spawning Aggregations (SCRFA)

Conferences and Workshops

Benny Chan

Invited presentation; Meeting of the Sessile Organism Society of Japan, 18-19 Nov. 2004, Tokyo, Japan.
6th Larval Biology Conference, 21-25 June 2004, The Hong Kong University of Science and Technology, Hong Kong.
41st Annual meeting of the Carcinological Society of Japan, 22-23 Nov. 2003, Okinawa, Japan.
Crustacean Society, 1-5 June 2003, Williamsburg, USA.

Andy Cornish

10th International Coral Reef Symposium, 28 June-2 July 2004, Okinawa, Japan.

Ji-Dong Gu

International Conference on Environmental and Public Health Management: Persistent Toxic Substances, 17-19 Nov. 2004, Hong Kong Baptist University, Hong Kong.
6th International Wetland Conference, 26-30 Oct. 2004, Avignon, France.
Invited presentation; 7th National Symposium on Environmental Microbiology, 23-25 Oct. 2004, Shanghai, China.
3rd International Nitrogen Conference, 12-16 Oct. 2004, Nanjing, China.
IWA 4th World Water Congress, 20-24 Sept. 2004, Marrakesh, Morocco.
24th International Institute for Conservation Congress, 13-18 Sept. 2004, Bilbao, Spain.
Anaerobic Digestion 2004, 29 Aug.-2 Sept. 2004, Montreal, Canada.

International Symposium on Biotechnology for Environmental Pollution Control, 14-15 Aug. 2004, Beijing, China.

Invited presentation; 1st China-Germany Symposium on Environmental Microbiology, 1-6 Aug. 2004, Beijing, China.

Co-organizer; 6th International Larval Biology Conference, 21-25 June 2004, The Hong Kong University of Science and Technology, Hong Kong.

European Symposium on Environmental Biotechnology 2004, 25-28 Apr. 2004, Oostende, Belgium.

Symposium on Marine Biology and Biotechnology, 20-24 Apr. 2004, Chinese University of Hong Kong, Hong Kong.

Invited presentation; 3rd Young Chinese Environmental Scientists Workshop, 17-18 Apr. 2004, Hangzhou, China.

National Association of Corrosion Engineers Meeting 2004, 28 Mar.-1 Apr. 2004, New Orleans, USA.

Invited presentation; International Workshop on Marine Pollution and Ecotoxicology, 25-26 Feb. 2004, Goa, India.

Invited presentation; Tropical Marine Research Institute, National University of Singapore, Jan 5-8, 2004, Singapore

Kenny Leung

Training Workshop on Integrated Environmental Impact Assessment, 29 Nov.-4 Dec. 2004, City University of Hong Kong, Hong Kong.

4th SETAC World Congress, Oregon, USA, 14-18 Nov. 2004, Portland, Oregon, USA.

International Joint Conference on Risk Assessment and Management, 4-6 Nov. 2004, Seoul, Korea.

Workshop on Bioindicators for Environmental Management, 1-12 Dec. 2003, City University of Hong Kong, Hong Kong.

Co-organizer; 12th International Symposium on Biological Indicators, 2-5 Dec. 2003, City University of Hong Kong, Hong Kong.

International Meeting of the Society of Environmental Toxicology and Chemistry, 28 Sept.-1 Oct. 2003, Christchurch, New Zealand.

Co-organizer; 4th International Conference on Marine Pollution and Ecotoxicology, 1-5 June 2004, City University of Hong Kong, Hong Kong.

12th International Symposium on Pollutant Responses in Marine Organisms (PRIMO), 9-13 May 2003, Florida, USA.

Yvonne Sadovy

Co-organizer; Mini-symposium on spawning aggregations, 10th International Coral Reef Symposium, 28 June-2 July 2004, Okinawa, Japan.

4th World Fisheries Congress, 2-6 May 2004, Vancouver, Canada.

Gray A Williams

Co-organizer; 6th International Larval Biology Conference. 21-25 June 2004. Hong Kong University of Science and Technology, Hong Kong.

Co-organizer; PRIMER statistical software workshop, 7-10 June 2004, Swire Institute of Marine Science, The University of Hong Kong, Hong Kong.

Co-organizer; Symposium on Marine Biology and Biotechnology, 20-24 Apr. 2004, Chinese University of Hong Kong, Hong Kong.

Invited speaker, Biodiversity Group, National University of Singapore, Jan. 2004.

Cynthia Yau

Co-organizer; 6th International Larval Biology Conference. 21-25 June 2004. Hong Kong University of Science and Technology, Hong Kong.

Invited speaker, International Conference and Workshop on Sustainable Management of Tropical & Subtropical Fisheries, 5-18 Sep. 2003, Keelung, Taiwan.

Postgraduates

Karen Qiu

10th International Coral Reef Symposium, 28 June-2 July 2004, Okinawa, Japan.

Situ Ying-Yi

6th International Larval Biology Conference, 21-25 June 2004, The Hong Kong University of Science and Technology, Hong Kong.

Wai Tak Cheung

Symposium on Marine Biology and Biotechnology, 20-24 Apr. 2004, Chinese University of Hong Kong, Hong Kong.

International Conference on the Environmental Management of Enclosed Coastal Seas (EMCS), 18-21 Nov. 2003, Bangkok, Thailand.

David YN Poon

Crustacean Society, 1-5 June 2003, Williamsburg, USA.

Symposium on Marine Biology and Biotechnology, 20-24 Apr. 2004, Chinese University of Hong Kong, Hong Kong.

Shirley CY Chow, Valerie CM Ho, Chien-Houng Lai, Janet KW Lee, Wang Ying Ying

Symposium on Marine Biology and Biotechnology, 20-24 Apr. 2004, Chinese University of Hong Kong, Hong Kong.

Student Graduations

Ph.D

Chan Kam Sheung (2003) - Variation in cyanobacteria-dominated biofilms: consequences for the diet, growth and reproduction of an intertidal grazer, *Siphonaria japonica*, on Hong Kong shores.

Wai Tak Cheung (2004) - Herbivore-induced effects and persistence of non-geniculate coralline algae in low-shore rock pools.

M.Phil

Chau Tak Han Gloria (2004) - Fishes feeding fishes: the composition, size and volume of wild fish feed used in Hong Kong's Mariculture Industry.

Lai Mei Yee (2004) - Fractionation, mobilization and bioaccumulation of heavy metals and mineralogical characteristics of the Mai Po Inner Deep Bay Mudflat.

Poon Yiu Nam David (2004) - The population dynamics and feeding ecology of the mangrove crabs, *Metopograpsus frontalis* (Grapsidae) and *Perisesarma bidens* (Sesamidae), in Hong Kong.

Sin Kai Wai (2004) - Molecular biology, physiology and metal-resistance of the ligninolytic enzyme system in a newly isolated Basidiomycete from a Hong Kong forest.

Wang Yanling (2004) - Isolation and characterization of environmental *Vibrio* species from Mai Po Nature Reserve, Hong Kong.

Wang Ying Ying (2004) - Bacterial degradation of ortho-dimethyl phthalate ester and adaptation of *Escherichia coli* K12 to carbon-limited growth.

Staff Training

James Hui, Cecily Law and Sylvia Yiu successfully completed the First Aid Refresher Course.

Cecily Law attended and completed the PRIMER Workshop in June 2004.

Albert Au, Cecily Law, Cheung Ming, Cheung Ming Hong and Wong Kam Kin completed a course entitled "Road Safety & Driving Improvement Course" organized by the Hong Kong Federation of Trade Unions, Spare Time Study Centre in July 2004.

Cheung Ming qualified as a PADI Dive Master while Cheung Ming Hong is now a PADI Diving Instructor.

Visitors to SWIMS

Opening Ceremony

Prof. Tsui Lap-Chee (Vice Chancellor, HKU)
 Mr. James Hughes-Hallett (Chairman, John Swire & Sons (H.K.) Ltd.)
 Mr. Andy Herdman (John Swire & Sons (H.K.) Ltd.)
 Mr. Michael Bell (Swire Pacific Ltd.)
 Mr. Davy Ho (Swire Pacific Ltd.)
 Prof. KM Cheng (PV Chancellor, HKU)
 Ms. Bernadette Tsui (Director, Development and Alumni Affairs Office, HKU)
 Ms. Isabella Wong (Director of China Affairs, Registry, HKU)
 Mr. Malcolm McGraw (Director of Land Development, HKU)
 Mr. Kenneth Wong (Director of Estates, HKU)
 Dr. FCC Leung (Dean, Faculty of Science, HKU)
 Prof. E Lam (Head, Department of Botany, HKU)
 Prof. KH Chu (CUHK)
 Dr. Qiu Jian-Wen (HKBU)
 Dr. Yan Yan (South China Institute of Oceanology, Chinese Academy of Sciences, China)
 Prof. Wu Xinzhong (South China Institute of Oceanology, Chinese Academy of Sciences, China)
 Prof. David Dudgeon (Head, DEB, HKU)
 Dr. RT Corlett (DEB, HKU)
 Prof. Brian Darvell (Faculty of Dentistry, HKU)
 Mr. Patrick Lau (AFCD)
 Mr. KY Kung (Director, Atelier VIII Architects Ltd.)
 Mr. Dennis Leung (Atelier VIII Architects Ltd.)
 Mr. Tony Chow (Atelier VIII Architects Ltd.)
 Mr. KH Mak (Director, Sinoway Construction Engineering Ltd.)
 Mr. KB Lee (Manager, Sinoway Construction Engineering Ltd.)
 Mr. KS Wong (Assistant Director, Estates Office, HKU)
 Mr. Paul So (Senior Assistant Director, Estates Office, HKU)
 Mr. KL Tam (Assistant Director, Estates Office, HKU)
 Dr. DJ Wilmshurst (Registry, HKU)
 Mr. CL Lui (JCL Consultant Ltd.)

Official Visitors

Sir Adrian Swire (John Swire & Sons Ltd.)
 Lady Judith Swire (John Swire & Sons Ltd.)
 Mr. Merlin Swire (John Swire & Sons Ltd.)
 Mr. Andy Herdman (John Swire & Sons (H.K.) Ltd.)
 Mr. Michael Bell (Swire Pacific Ltd.)
 Prof. Wu Xinzhong (Zhejiang University, China)
 Prof. Steve Hawkins (Director, Marine Biological Association UK)
 Prof. Christopher H.K. Cheng (CUHK)
 Prof. Tatsuo Higa (University of the Ryukyus, Japan)
 Prof. Shigemitsu Shokita (University of the Ryukyus, Japan)
 Prof. Malcom B Jones (University of Plymouth, UK)
 Dr. Josephine Hagger (University of Plymouth, UK)
 Mr. Andrew Walton (City U HK)
 Dr. Christof Althoff (HKUST)
 Ms. Suzanne Gendron (Ocean Park, Hong Kong)
 Mr. Edward Wong (AFCD)
 Dr. Khaki Chan (AFCD)
 Mr. Dickey Lau (AFCD)
 Mr. Patrick Lau (AFCD)
 Dr. Leung Kim Fung (EPD)
 Prof. Ichiro Takeuchi (University of Ehime, Japan)
 Ms. Fei Fei Barnes (WWF-HK)
 Ms. Rosanna Sit (WWF-HK)
 Mr. Richard Jones (Sinopix)
 Dr. Lindsay Porter (WWF-HK)
 Dr. Sharon Abbot (City U HK)
 Ms. Kathy McClellan (City U HK)
 Mr. Yeung Wai Yin, Leo (Hong Kong Cetacean Research Project)
 Dr. Tadasu K Yamada (Hong Kong Cetacean Research Project)
 Prof. KH Chu (CUHK)
 Mr. William Siu (City U HK)
 Ms. Karen Tang (Director, External Relations Office, HKU)
 Ms. Fanny Leung (External Relations Office, HKU)
 Ms. Shirley Yeung (External Relations Office, HKU)
 Ms. Benny To (External Relations Office, HKU)
 Dr. Richard Cheung (City U HK)
 Mr. Michael Warne (NSW EPA, Australia).

Mr. Quentin Yue (Department of Civil Engineering, HKU)
 Dr. GC Fiedler (University of Maryland, USA)
 Dr. Josie Close (Department of Architecture, HKU)
 Mr. Lam King Hang (Department of Architecture, HKU)
 Mr. Huey Pang (Department of Architecture, HKU)
 Mr. Timo Zorn (Tango Film, Germany)
 Mr. Danny Ip (HKTb)
 Dr. CJN Fletcher (Arrow Geoscience Ltd.)
 Ms. Christina Lo (RTHK)
 Mr. Michael Pitts (Centre Screen)
 Mr. David Postlethwaite (Centre Screen)
 Mr. Wong Chun Yin (Ming Pao Daily News)
 Ms. Wong Ka Ka (Ming Pao Daily News)
 Mr. Raymond Chiu (Kou Hing Hong Scientific Supplies Ltd.)
 Mr. Scott Murphy (Hong Kong Magazine)
 Dr. Ross Smith (Hydrobiology Pty Ltd., Australia)
 Dr. Victor Wepener (University of Zululand, S. Africa)
 Dr. Jae-Seong Lee (Hanyang University, S. Korea)
 Dr. Toshihiro Horiguchi (National Institute for Environmental Studies, Japan)
 Dr. Gen Kume (National Institute for Environmental Studies, Japan)
 Dr. Tania Ng (HKUST)
 Dr. Cheung Ma Shan (HKUST)
 Dr. Claire Bennett (Melbourne University, Australia)
 Dr. Serena Tao (National University of Singapore, Singapore)
 Prof. Mike Hadfield (University of Hawaii, USA)
 Prof. Christopher McQuaid (Rhodes University, S. Africa)
 Dr. Edwin Bourget (University of Sherbrooke, Canada)
 Dr. Ruth O'Riordan (National University of Singapore, Singapore)
 Ms. Lee Wan-Jean (National University of Singapore, Singapore)
 Mr. Neol F Riamsy (National University of Singapore, Singapore)
 Dr. Andy Davis (Wollongong University, Australia)
 Mr. SW Chan (Asia Technology)
 Mr. Mark Kwok (Asia Technology)
 Mr. Brian Ho (Asia Technology)
 Dr. Moni Chin (AEC)
 Dr. Put Ang (CUHK)
 Mr. Fung Ho Lam (CUHK)
 Mr. Chiu Yat Ming (CUHK)
 Dr. Jo Clark (Treasure Island, HK)
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 Mr. Eric Bohm (WWF-HK)
 Ms. Ellen Shek (WWF-HK)
 Ms. Tracey Bond (TVB Hong Kong)
 Mr. Stephen Pahl (Adelaide University, Australia)
 Prof. J Malpas, PV Chancellor, HKU
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 Mr. K Wong, Earth Sciences, HKU

Ms. Virginia Lee, AFCD
 Dr. Sharon Abbot, City U HK
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 Mr. Tam, Man Cheong, CUHK
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 Dr. Yan, Tao, South China Sea Institute of Oceanology, China
 Dr. Beverly Goh, National Institute of Education, Singapore
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 Ms. Ali Hunt, National Institute of Education, Singapore
 Mr. Eric Liu, AFCD
 Mr. Alfred Wong, AFCD

Institutional abbreviations:

AFCD - Agriculture, Fisheries and Conservation Department; **City U HK** - City University of Hong Kong; **CUHK** - The Chinese University of Hong Kong; **DEB**, **HKU** - Department of Ecology & Biodiversity, The University of Hong Kong; **EPD** - Environmental Protection Department; **HKBU** - Hong Kong Baptist University; **HKUST** - Hong Kong University of Science and Technology;

Group Visits

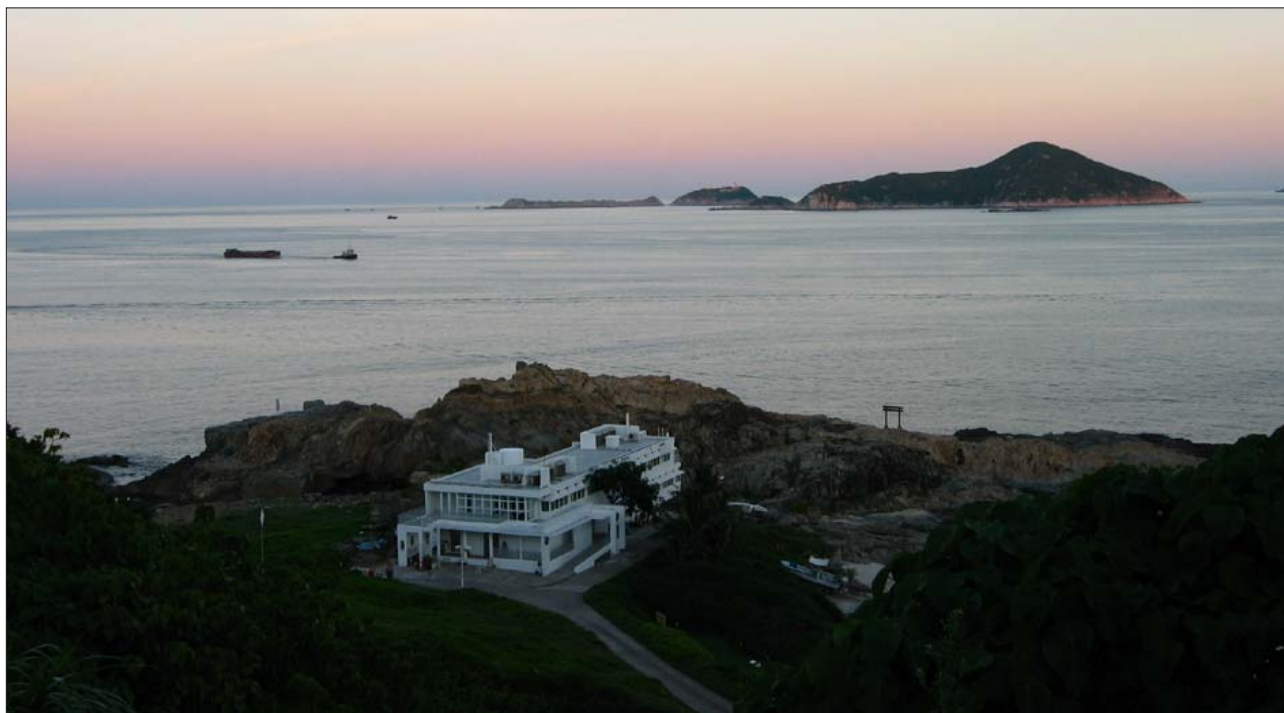
40 students from the M.Sc in Environmental Management, HKU, Sept. 2003
 Staff and 46 students from King George V School, Nov. 2003
 14 students from the 1st year, Environmental Life Science, HKU, Mar. 2004
 36 students from the Coastal Ecology class, HKU, Apr. 2004
 Staff and 23 students from Heung To Middle School, Apr. 2004
 10 6th form students, South Island School, May 2004
 Staff and 20 students from South Island School, May 2004
 Staff and 42 students from Island School, June 2004
 Staff and 42 students from South Island School, June 2004
 20 S4-S6 Summer Science Institute students, July 2004
 35 ambassadors from Hong Kong Young Ambassador Scheme 2004, July 2004
 50 Alumni, mentors & mentees, HKU, July 2004
 Staff and 19 students from TWGH Li Ka Shing College, Aug. 2004
 8 staff from WWFHK, Aug. 2004
 20 staff from WWFHK, Sept. 2004
 Staff and 15 students, City University of Hong Kong, Sept. 2004
 43 students from the M.Sc in Environmental Management, HKU, Sept. 2004
 Staff and 20 students, Institute of Human Performance, Oct. 2004
 Staff and 40 students from Immaculate Heart of Mary College, Nov. 2004
 Staff and 21 students from Kennedy School, Nov. 2004



Visitors from Japan and Chinese University, HK admire the new aquarium facilities

Pig cutting ceremony to celebrate the start of the renovation

A sixth form school visitor gets to grips with a sea urchin in the SWIMS aquarium



Acknowledgements

Sir John and Sir Adrian Swire, John Swire & Sons Ltd
 James Hughes-Hallett, The Swire Group of Companies, Hong Kong
 Prof. Tsui Lap-Chee, Vice-Chancellor, HKU
 Mr. M McGraw, Director of Land Development, HKU
 Mr. KP Wong, Director, Estates Office, HKU
 Mr. KS Wong, Assistant Director, Estates Office, HKU
 Dr. D Mabbott and staff, Safety Office, HKU
 Mr. PBL Lam, Director of Finance Office, HKU
 Ms. Bernadette Tsui and staff, Development and Alumni Affairs Office, HKU
 Ms. Karen Tang and staff, External Relations Office, HKU
 Prof. D Dudgeon and staff, Department of Ecology & Biodiversity, HKU
 Ms. Min Chandiramani, CAUT, HKU
 Mr. KY Kung and staff, Ateliers VIII Architects Ltd
 Directors and staff, WWF HK
 Mr. TCY Chan, Director of Agriculture, Fisheries and Conservation Department
 Dr. FY Wong, AFCD

Mr. Edward Wong, AFCD
 Mr. Patrick Lau, AFCD
 Dr. Ivan Chan, AFCD
 Mr. Alex Kwok and staff, AFCD
 Mr. RJS Law, Director of Environmental Protection Department
 Dr. Paul Shin, Chairman and Council of The Marine Biological Association of Hong Kong
 Mr. Lui and staff, PCCW Cape d'Aguilar station
 Mr. Lam Chiu Ying and staff, the Hong Kong Observatory
 Ms. Suzanne Gendron, Mr. Timothy Ng and staff, Ocean Park Conservation Foundation
 Clearwater Bay Country Club
 Volunteer divers, particularly Mr. C Frew
 Mr. CP Lee, Director, Winsome Paints Co. Ltd.
 Staff and students of King George V. School
 Staff and students of Island School
 Staff and students of South Island School
 Staff and students of Immaculate Heart of Mary College

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Albert Au, Benny Chan, Damgy Chan, Ken Ching and WWF HK, Shirley Chow, Andy Cornish, Fiona Gore, Ji-Dong Gu, James Hui, Valerie Ho, KF Leung, Karen Lui, Richard Jones, Jasmine Ng, Avis Ngan, Wai Tak Cheung, Gray Williams, Cynthia Yau, Ariel Yeung, External Relations Office (HKU), Second Year Coastal Ecology Students



Winsome Paints sponsored the repainting of the whale in 2004

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