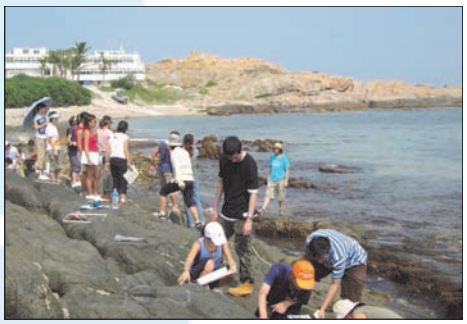
The Swire Institute of Marine Science

太古海洋科學研究所



Annual Report

2008

Honorary Director's Foreword

2008 has been a particularly important year for SWIMS as we have seen a significant increase in academic staff. In August, we welcomed Dr Vengatesen Thiyagarajan (Rajan) who joined us from HKUST as an Assistant Professor, and we have recently appointed Dr Clement Dumont as a Research Assistant Professor from Stanford University. Already, both Rajan and Clement have injected new ideas and perspectives into SWIMS and are quickly building their research groups. Dr Nathalie Goodkin has also joined SWIMS as a Non-resident scientist. Nathalie is in the Department of Earth Sciences and the School of Biological Sciences and works on coral cores to better understand historical climate change. Dr Lesczek Karcmarski, from University of Pretoria, South Africa, and University of Texas, USA, has accepted the Associate Professorship in marine mammal biology, jointly sponsored by Ocean Park Conservation Foundation HK and will join SWIMS in summer 2009.

In terms of students, we are very grateful to the Swire Educational Trust who have established two new SWIMS scholarships: the Swire Hong Kong PhD Scholarship in Marine Biology and the James Henry Scott PhD Scholarship. We are currently in the process of filling these prestigious studentships. The Swire group also generously supported our purchase of a new research vessel to replace our ailing Boston Whaler. The twin-hulled Kevlacat will be formally launched in 2009 from our boat ramp which was newly renovated this summer.

It has also been a good year for collaborations with other institutions. SWIMS has signed two Memoranda of Understanding, with the State Key Laboratory, Xiamen University, PR China and King Mongkut's Institute of Technology Ladkrabang, Thailand, both of which involve exchange of staff and students. I foresee that such collaborations will become more important in the future as SWIMS plays a more pivotal role in the SE Asia region, and look forward to promoting more of such links in 2009.

Best wishes for 2009 and the Chinese Year of the Ox from the staff and students of SWIMS.

Gray A Williams

Colleagues from MEL Xiamen University and HKU celebrate their partnership with dinner in Xiamen

International Collaborations

In January 2008, SWIMS co-hosted a joint workshop in Marine Environmental Research. This was a unique collaborative meeting where over 150 delegates from the State Key Laboratory of Marine Environmental Science (MEL), Xiamen University, China, the centre for Marine Environmental Research and Innovative Technology and SWIMS, joined to discuss marine environmental research. During the two day session at HKU colleagues met to share their views and ideas on a variety of marine issues with a focus on ecosystem responses to climate change. The conference also involved meetings between technical staff from the institutions, further strengthening collaborative links. In light of the success of this meeting, SWIMS and MEL signed a Memorandum of Understanding (MoU) in the summer to promote further exchanges. To date, Kenny Leung, Rajan and Gray Williams have visited Xiamen to give a series of talks and discuss research plans. During one of these visits, Gray and Rajan were able to meet Prof ZG Huang (Third Institue of Oceanography, Chinese Academy of Sciences) who has been involved with SWIMS since its establishment. In the reciprocal arrangement, staff and students from Xiamen joined HKU's annual ecology fieldcourse. Currently, postgraduate students at SWIMS and MEL are planning an annual research colloquium, the first of which SWIMS will host in March 2009.

In line with SWIMS' aim to develop links within SE Asia, we signed another MoU with King Mongkut's Institute of Technology Ladkrabang, Bangkok. This MoU is to develop research in coral and rocky shore ecology, and involves research visits by students to both institutions. Ms Araya Daengroj visited SWIMS with her supervisor Dr Monthon Gamanee to work on coral reproduction with James True. In March, Gray Williams, June Leung, Kiki Khangura and Stephen Cartwright visited Thailand to conduct field work at Sri Chang Island.

These new agreements are an important development for SWIMS as we hope to establish stronger networks in the region.

The Opening Ceremony of the MMS workshop at The University of Hong Kong

Rajan, Gray and Prof Cai (MEL, Xiamen) meeting with Prof ZG Huang in Xiamen

The MoU ceremony between SWIMS and King Mongkut's Institute of Technology Ladkrabang

The combined delegates at the joint MMS workshop on Marine Environmental Research, January 2008

Ivy and Sarah on a humpback whale survey in the Philippines

Tail fluke of a humpback whale seen in the Philippines

Ho Pak and Cindy with team members studying tigers in Laos

香港海洋公園保育基金
Ocean Park Conservation Foundation Hong Kong

SWIMS and Ocean Park Conservation Foundation Hong Kong

Our collaboration with the Ocean Park Conservation Foundation Hong Kong (OPCFHK) continued for a fourth successive year with a team of six of our students joining the largest OPCFHK University Sponsorship Programme yet. In 2008, students from The Chinese University of Hong Kong, City University, the Hong Kong University of Science and Technology, as well as HKU, took part in conservation projects around SE Asia.

Undergraduates Sarah Mak and Ivy Mak conducted small-boat surveys of humpback whales as part of a science and community -based conservation programme in Babuyan Islands, northern Luzon, Philippines. Postgraduates Wan Ho Pak and Cindy Yuen trekked through montane forests of Laos in search of tigers and other large carnivores in order to assess their prey selection as part of the Tiger Conservation Project of Laos Program. Postgraduate William But teamed up with undergraduate Molly Fu to study cetacean biodiversity and abundance in East Kalimantan, Indonesia, where they got the opportunity to swim with green turtles, as well as several species of dolphins. All the students returned with fascinating accounts of their trips and on the importance of the conservation projects they had participated in. We are grateful for the support of OPCFHK which has allowed our students the invaluable opportunity of experiencing such conservation projects first-hand.

This year we recruited Dr. Lesczek Karczmarski as an Associate Professor, cosponsored by the OPCFHK. Lesczek works on various aspects of dolphin behaviour and will join SWIMS in summer of 2009 to further cement our links with OPCFHK.

Lesczek Karczmarski during fieldwork at Kure Atoll, far western Hawaii

Staff Research

Gray A Williams

Gray collecting samples at SWIMS

The role of environmental stress on intertidal organisms dominated this year's research, especially the combined effects of heat stress and monsoon rains. Together with Drs David Morritt and Maurizio de Pirro, we investigated the synergistic effects of heat stress and freshwater rain on physiological responses of limpets, specifically *Cellana grata*. With Rajan and Ng Wai Chuen, we were also able to investigate the proteomic responses of these animals, allowing us a molecular level insight into how they tolerate these stresses. *C. grata* is assumed to be distributed from Japan to Vietnam, but recent work with Dr Tomo Nakano (Tokyo Museum) indicates this species is a complex of different species, suggesting we need to revise our ideas of how this animal responds to climate changes along the western Pacific.

Kenny Leung

Kenny and Prof. Jae-Chun Ryu, the President of the KoEHS

Copper (Cu) levels in coastal waters and sediments of Hong Kong are elevated due to sewage discharge, surface runoff and leaching of Cu-based antifouling paints. Our research has shown that the marine copepod *Tigriopus japonicus* has a high tolerance to Cu which can be developed through multigenerational exposures. However, the acquired resistance has a fitness cost as population growth is significantly reduced, although this appears to be a plastic physiological adaptation rather than gene evolution. In collaboration with Drs Eric Grist and Jonathan Rhodes of CSIRO (Australia), we have developed a novel Bayesian mixture model for analysing such multigenerational chronic toxicity data. In October 2008, I was invited by the Korean Society of Environmental Risk Assessment and Health Science (KoEHS) to give a plenary lecture on "*Ecotoxicology and ecological risks of antifouling biocides to marine organisms*".

V. ThiyagaRajan

Rajan collecting various larvae in Hong Kong coastal waters

One of the primary objectives of environmental science is to understand the effects of rising CO_2, temperature and decreasing ocean pH (ocean acidification) on early-life stages of marine invertebrates at the behavioural, molecular and ecological levels. Currently we are developing Environmental Proteomics and Larval Culture & Ocean Acidification laboratories to study the molecular adaptive mechanisms of larvae to ocean acidification and climate change. Specifically, our research group focuses on the effects of present environmental stressors and future climate change scenarios on larval metamorphosis in ecologically and commercially important organisms (bryozoans, polychaetes, barnacles and oysters). Ultimately, we plan to link these early life-stage responses to population dynamics, biodiversity, biofouling control and mariculture.

Propagated fragment of the coral, Turbinaria peltata

Cynthia Yau

Hong Kong has a surprisingly high diversity of corals, yet despite their conservation value and protected status, little is known about the conditions that affect their growth in local waters. My research group is using artificially propagated fragments of various species as multiple replicates in experimental studies. We have tracked the reproductive growth of corals through the year, providing new insights into their spawning patterns. We have also discovered that salinity is an important influencing factor in the distribution of Hong Kong corals. Reduced salinities resulting from high rainfall in the summer can lead to mortality of susceptible species. A better understanding of the conditions that corals require will help us maintain the health of local coral communities.

Group picture of the Fisheries and Mariculture BSc class after visiting a fish farm

Yvonne Sadovy

2008 has been a busy year for several conservation projects. Our new underwater survey methodology and fishery model for the Napoleon fish, *Cheilinus undulatus*, has been applied in Malaysia, a key exporting country of Napoleons. Based on our results, the government is adopting a radically reduced quota to help populations recover. Long-term work on spawning aggregations is building momentum with initiatives in Colombia (under the Food and Agricultural Organization of the United Nations), Mexico, Fiji, Palau, Australia and Guadeloupe. I have also led assessments of the conservation status of reef fishes, many of commercial importance, in Brazil and Spain. In Barcelona, we released a book on marine conservation and a short film which is attracting international attention. Our fundamental objective is to use good science as the foundation for conservation and management.

Demonstration of metal uptake by corn seedlings through experiments

Ji-Dong Gu

One research area this year has been on the phytoremediation of pollutants including methyl *tert*-butyl ether (MTBE), cyanide and metals (Cr, Se) by willow, hybrid willow and corn. Assimilation and uptake of metals (Cr, Se), ferrocyanide and ferricyanide were investigated using plant model systems to obtain information on their potential toxicity, metabolism and transport/accumulation in plants. Willow assimilates MTBE from the aqueous phase and transpires it into the atmosphere where the chemical is photo-decomposed, while corn is very effective in cyanide uptake and integrates it into amino acids. Both Cr and Se can be up taken by plants but the majority are associated with the roots.

Post Doctoral Fellows

Wai Tak-Cheung

Wai Tak-Cheung focused his research on the trophic dynamics and functioning of local marine systems. In Hong Kong, due to the monsoonal climate, there is a dynamic, seasonal change in food supply to marine consumers in different habitiats. To study the energy flow, Wai used fatty acid and stable isotope analyses to trace the source and fate of autotrophic and detrital energy sources. He is currently focusing on the food utilization of predatory fishes in estuarine and rocky habitats, and the significance of the detrital pathway in supporting tertiary consumers in these food webs. In April 2008, he initiated an echinoderm survey to assess the current biodiversity status of echinoderms, especially sea urchins, in Hong Kong.

The cryptic starfish Asterina *cf.* orthodon *in Hong Kong*

Liu Min

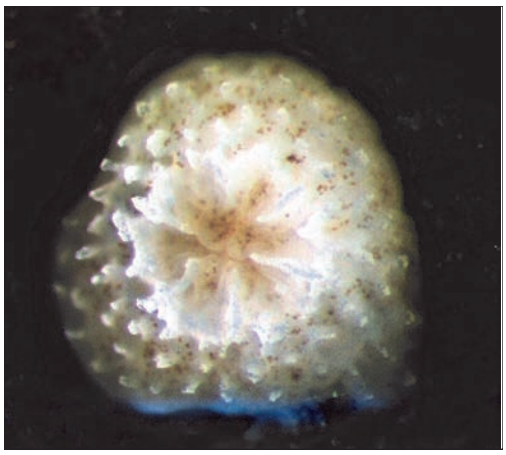
Work this year focused on the Hong Kong grouper (*Epinephelus akaara*), listed on the IUCN Red List as 'Endangered' in 2006. Min's first aim is to collect first-hand information on the exploitation and mariculture history of *E. akaara* throughout its geographic range. Results have revealed that captures of *E. akaara* have shown large declines in all traditional fishing grounds and fishers have moved to distant, unexploited grounds, where larger individuals are occasionally caught. *Epinephelus akaara* mariculture has been conducted for more than 30 years; however, wild-caught juveniles are still the only seed source for growing-out. To achieve sustainable fisheries for *E. akaara*, we are aiming for better management options and conservation strategies.

*The Hong Kong grouper (*Epinephelus akaara*) for sale in Zhejiang Province*

Ng Wai Chuen

Ng Wai Chuen focuses his research on the population genetics and stress responses of marine animals. One of his study themes is on the effect of projected climate change on the physiological response of intertidal communities using the regionally common limpets *Cellana grata* and *C. toreuma* as model species. Through on-site monitoring and laboratory verification, potential biomarkers were identified for heat and other environmental stresses based on differentially expressed proteome profiles. He is also taking part in an investigation on the supply side ecology and population genetics of the barnacles *Tetraclita* spp. in SE Asia, as well as small -scale genetic structure of the limpet *C. grata* along Hong Kong shores. These studies aim to resolve genetic linkage and the possible pattern of larval transport on a regional scale.

Chuen demonstrating to The Lion Club of Center Point



Corallite of a newly settled coral juvenile

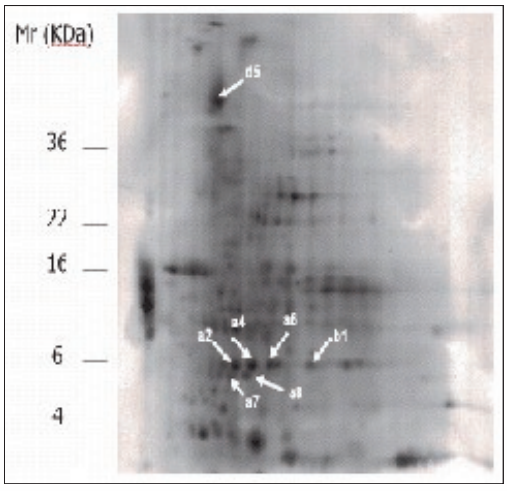
James True

James continued research into factors controlling the success of corals in marginal environments. This is part of a larger project involving corals in Hong Kong and the Gulf of Thailand. Stress is also reflected by an increased incidence of disease; and James and co-workers have also undertaken epidemiological work into undescribed pathogens of corals. The SWIMS coral farm was expanded and the recirculation environment improved. Four species spawned in the farm, and their larvae settled on artificial substrates. This year also marked the first time that paleo-environmental records were extracted from HK coral cores; James and co-workers from Earth Sciences are working to reconstruct the monsoon and pollution history of HK waters based on the geochemistry of coral cores.

Apostolos checking his cultures

Apostolos Koutsaftis

Apostolos investigated the mixture toxicities of antifouling biocides on marine organisms. Antifouling paints usually contain copper (Cu) as the principal biocide in combination with other synthetic organic biocides. The possible coexistence of these pollutants in the marine environment might lead to enhanced adverse effects against non-target organisms. Current water quality criteria (WQC) are, however, derived solely from ecotoxicity data generated for each individual biocide. In his study, combined effects of binary mixtures of Cu and organic biocides were tested against several species and modelled. When synergistic or additive effects are detected, such data can be used to derive more appropriate WQC for these compounds at environmentally realistic ambient Cu levels.



Stressor-specific MT isoforms found in Thais clavigera

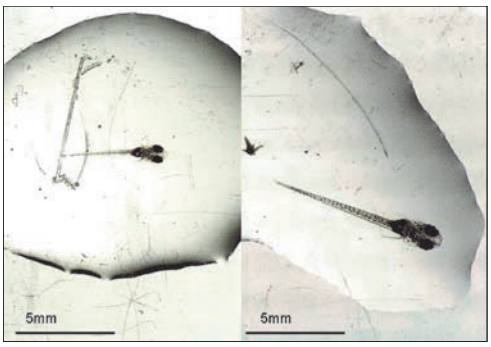
Cheung Ma Shan Michelle

Metallothioneins (MTs) are a group of soluble, cysteine-rich, heat-stable, and non-enzymatic proteins which are common in marine molluscs. Their physiological roles include regulation of essential metals, detoxification of toxic metals and acting as antioxidants. Different MT isoforms with distinct physiological functions can be induced corresponding to exposure to different pollutants. Michelle has investigated the expression profile of two MT isoforms (Cu-MT and Cd-MT) in different organs of the whelk, *Thais clavigera,* exposed to various chemical stressors. Her results suggest that only Cd-MT can be induced in *T. clavigera* with respect to both metal and non metal exposures, and thus it may serve as a general biomarker for oxidative stress.

Postgraduate Research

Investigating the ecotoxicity of nanomaterials

The rapid proliferation of engineered nanomaterials presents a challenge to regulators regarding their hazard identification and regulation. One of the focuses of Kevin Kwok's work was to investigate the ecotoxicity of three common nanomaterials, (double-walled carbon nanotubes, nano titanium oxide, nTiO and nano zinc oxide, nZnO) to marine organisms. Using the diatom *Thalassiosira*, copepod *Tigriopus japonicus* and medaka fish, he found that the three nanomaterials differ in toxicity and likely have different toxic mechanisms. Amongst the three, nTiO is the least toxic while nZnO is the most toxic. His work has provided useful information for the regulation of these nanomaterials.



Larval medaka exposed to nano zinc oxide for 14d are smaller (left) as compared with control animals (right)

Irgarol 1051 - out of the frying pan into the fire?

Irgarol 1051 is a popular biocide booster used in copper-based antifouling paints to replace organotins. As a herbicide, Irgarol is very effective against aquatic plants and shows minimal toxicity to animals. Amy Zhang's studies have shown that Igarol 1051 undergoes various degradations which yield related s-triazine compounds, so far identified as M1, M2, M3 and M4. Amy showed that some of these compounds also possess strong phytotoxicity, but despite this they are receiving little attention in environmental regulations.

Amy receiving the 1st Hong Kong Science and Technology Parks Scholarship

Under the intertidal oak tree

The acorn barnacle, *Tetraclita japonica,* is common on Hong Kong's exposed shores. Stephen Cartwright is investigating whether this sessile species provides a biological refuge for other organisms from the tropical summer heat. This year, Stephen focused on the physiological benefits of this association and demonstrated that two common organisms, *Cellana grata* and *Acanthopleura japonica*, lost less water, had lower body temperatures and heart rates when shaded by barnacles as compared to unshaded individuals. Such facilitation is clearly important for many marine organisms when emersed and exposed to the tropical sun.

Stephen investigating barnacles on the shores of Qingdao, China

Juvenile of Epinephelus bruneus*, a "vulnerable" species in the IUCN*

Biology and fisheries of groupers in Hong Kong, and implications for management

Allen works on the biology and fisheries of groupers in Hong Kong and nearby waters. His thesis addresses the biology of two heavily exploited groupers in Hong Kong, *Epinephelus awoara* and *Epinephelus quoyanus*. As found in other groupers, these species are protogynous hermaphrodites. Partly due to their late sexual maturity and heavy local fishing pressure, a large proportion of groupers in the local wet market trade are juveniles, the capture of which may have significantly reduced the number of mature fish in the wild.

Vivien at SWIMS

Elevated toxicities of antifouling biocides at thermal extremes

In light of thermally driven climate change, higher temperatures, larger temperature fluctuations and more frequent extreme weather are predicted in the future. Vivien Bao has been studying the interactive effects of temperature and toxicity of two common antifouling biocides, chlorothalonil and copper pyrithione to the copepod *Tigriopus* and dinoflagellate *Pyrocystis*. Her results demonstrate that biocide toxicity generally increases with increasing temperature although this effect is chemical-dependent. Vivien's work shows that routine standard ecotoxicity tests should not solely use an optimal temperature as the test condition, but should cover a wider range of temperatures to account for the foreseeable combined temperature and chemical effects on marine organisms.

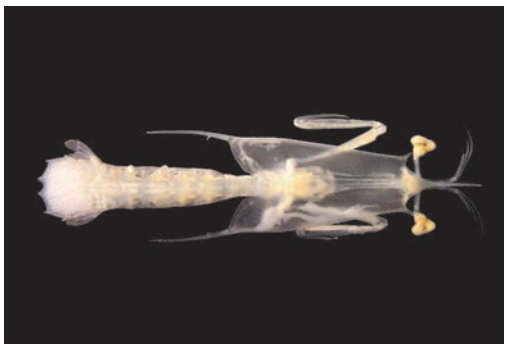
Shadow examining an egg case of the bamboo shark

The whitespotted bamboo shark in Hong Kong

Shadow Sin works on the reproductive biology, age and growth of one of the only commonly encountered shark species in Hong Kong waters, the whitespotted bamboo shark (*Chiloscyllium plagiosum*). Shadow has found that >75% of the samples collected from local wet markets were below the size of first sexual maturation, indicating this fishery is largely based on juveniles, which should be an area of concern regarding the future of this species. Overfishing is one of the reasons which drove the change from formerly abundant and larger individuals to the present fewer and smaller individuals of the bamboo shark, and caused the disappearance of larger shark species from local waters.

Larval ecology of stomatopods in Hong Kong waters

Ricky Tang's project aims to assess the larval ecology of stomatopods (mantis shrimps) in terms of their seasonal and geographic abundance in Hong Kong waters. He found that densities of stomatopod larvae were higher in May and October, which represented the peak seasons of stomatopod spawning. In addition, stomatopod larval densities were significantly higher in southwestern waters off Lantau Island than in northeastern waters of Tolo Harbour and Channel. DNA was used to identify larvae to species level. A total of 9 different larval morphotypes were identified by barcode matching to 7 species, although 2 larval morphotypes remain unidentified.



Late stage larva of Oratosquilla oratoria

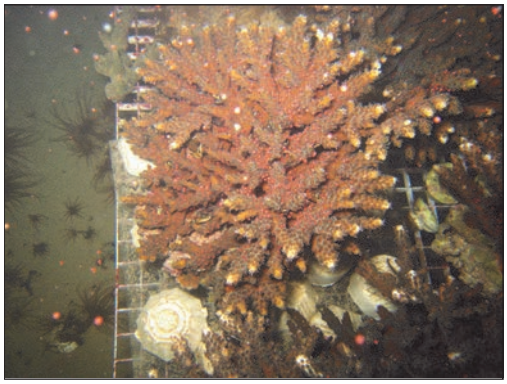
The ecology and distribution of chaetodontids in Hong Kong waters

Stanley Shea recently completed his MPhil study on the ecology and distribution of chaetodontids (butterflyfishes) in Hong Kong across a range of spatial and temporal scales. After 324 dives, his research showed that of the 16 chaetodontids in Hong Kong, *Chaetodon speculum* was the most abundant species and that the overall pattern was governed by substrate (coral) complexity. Seasonal variation in relative abundance and species richness of chaetodontids showed higher abundances and species diversity in summer than winter. In addition, Stanley found that territory size of *Chaetodon lunulatus* was significantly larger than that of *C. speculum* due to different dietary dependences of the two species.

Stanley observing butterflyfish

Reproduction and growth of scleractinian corals in Hong Kong

The chief objective of Christine Yeung's research is to investigate the reproductive biology of local scleractinian corals, in particular, to determine their spawning season. Selected stony coral species were sampled regularly to assess their gametogenic status by histological analysis. In addition, colonies of corals were collected and maintained in aquaria to observe spawning. Spawning of *Acropora* spp. was observed in May and June, and the egg-sperm bundles released by the corals were used to study the effect of salinity on their fertilization success.



A spawning Acropora pruinosa *colony*

William deploying his data loggers

Effect of reduced salinity on stony corals

Scleractinian (or stony) corals are generally restricted to oceanic conditions with high salinities. William But's study investigates the salinity tolerance of six coral species from Hong Kong waters in order to determine the effects of low salinity on their physiology; and thus relate the biogeographical distribution of different coral species with patterns of salinity variation. Temperature - salinity data loggers have been deployed to record seawater temperature and salinity fluctuations at five coral sites. The data will provide an insight into how physical factors vary through the year in coral communities and the environmental conditions scleractinian corals can tolerate.

Planaxis sulcatus *aggregating on bare, flat rock surfaces in winter*

Seasonal variation in spatial patterns of *Planaxis sulcatus*

June Leung has been studying aggregation patterns in rocky shore snails, focusing on *Planaxis sulcatus*. In winter, the snails form large, dense aggregations on the open rock surfaces, but in summer, only solitary snails are seen on open rocks and most snails reside in "refuge" microhabitats. Hiding in these habitats helps them lower body temperatures and maintain more water than outside these areas. These different spatial patterns are likely driven by changes in environmental conditions in the two seasons. In the next year, June will determine what causes snails to aggregate in winter and whether formation of these spatial patterns involves active choices made by the snails.

The green-lipped mussel, Perna viridis*: different size ranges exhibit different RNA/DNA ratios*

RNA/DNA ratio as health biomarker in mussels

Since January 2008, Jamius Yeung has been investigating if RNA/DNA ratios can be used as a health biomarker in the green-lipped mussel, *Perna viridis*, a common biomonitor for marine pollution. Jamius has uncovered that the RNA/DNA ratio varies among different tissues in *P. viridis* with higher levels in haepatopancreas and adductor muscles, while small animals tend to have higher RNA/DNA ratios than large animals. Her results also suggest that the ratio is sensitive to detect subtle changes in nutritional status of *P. viridis*. At present, Jamius is testing the hypothesis that the RNA/DNA ratio decreases with increasing ambient concentration of chemical contaminants in seawater.

Effects of heat and rain stresses on *Cellana toreuma*

Heat and desiccation stresses during low tide emersion periods are often cited to explain the distribution of intertidal species. However, many tropical areas like Hong Kong also experience heavy monsoon rains, which can have adverse effects on intertidal organisms, such as dislodgement, rain run-off and hypo-osmotic stress. To investigate the relative importance of these stresses, Kiki Khangura is studying the effects of prolonged heat stress, periodic hypo-osmotic stress, and their synergistic effects. She hopes that this information will help us to understand the cause of summer mass mortalities of a common limpet, *Cellana toreuma*, and provide an insight into how some individuals survive in such conditions.

Kiki taking wet weight measurements of Cellana toreuma

Croaker species commonly used in the dried swimbladder trade in Hong Kong

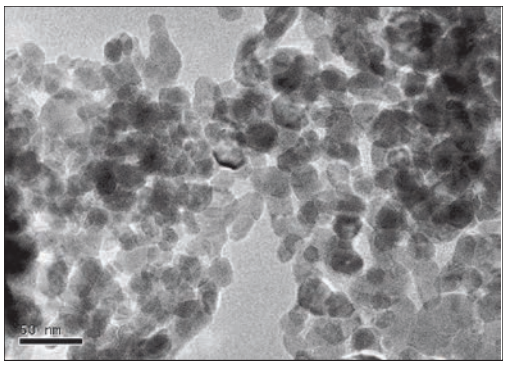
Fishes of the family Sciaenidae, or croakers, are highly fecund, marine or estuarine teleosts that inhabit coastal waters. Cynthia Tuuli's study reviews the current status of the croaker fishery globally, with a focus on croaker trade in selected wet fish markets in Hong Kong. She is also investigating the reproductive biology of *Pennahia anea*, one of the few remaining common croakers currently on sale. Finally, she is pioneering a novel approach to identify croaker species involved in the dried swimbladder trade using genetic techniques.

Cynthia extracting DNA material from dried swimbladders

Mating strategies of mangrove snails in Hong Kong

Within the family Littorinidae, the majority of *Littoraria* species graze on mangrove trees in tropical regions. During the mating season, male snails search for females to form mating pairs. However, the cues which lead to successful encounters between pairs within the dense tree canopies remain a mystery. Terence Ng's study investigates this behaviour in two dominant mangrove snails in Hong Kong, *Littoraria melanostoma* and *L. ardouiniana*. He is testing whether strategic locomotor patterns or chemical cues in the snail mucus trails play an important role in assisting the mating of these snails. From this project, Terence will try to reveal the molecular mechanisms driving mating behaviour in these snails using proteomic technology.

Terence searching for snails on a mangrove tree



Nano-zinc oxide observed under the transmission electron microscope (TEM)

Small things matter more than you think

Engineered nano-metal oxides, such as nano-zinc oxide (nZnO), are used as active ingredients in sunscreen, however, their ecological risks to marine organisms are largely unknown. Over the last year, Stella Wong has been investigating the toxicities of nZnO to various marine organisms. She has discovered that crustaceans are generally more vulnerable to nZnO as compared to algae and fish. The toxicities of nZnO, bulk ZnO and zinc sulphate are comparable based on their dissolved zinc concentrations. In the future, Stella will examine the toxicities of these nanomaterials under varying salinities and in the presence of humic acid, which is common in coastal waters.

Pelagic thresher shark, Alopias pelagicus, *found in a wet market in Hainan Island*

The shark fisheries along the coast of southern China and the reproductive biology of the spadenose shark

Over the past year, to shed light on the historic and present day shark fisheries of the region, Vivian Lam has conducted market surveys and interviews in fishing ports along the southern coast of China. Her study provides important information on shark diversity and abundance that will aid in the conservation of shark species in the South China Sea. The spadenose shark (*Scoliodon laticaudus*) is one of the most common sharks in the region. Monthly samples have been collected to study their reproductive biology and provide biological data to better manage their fishery.

TJ at Cheju Island, South Korea

Searching for aging biomarkers

Over the last year, Tae-Jin Park has been working on the RGC funded project "Characterization of metallothionein isoforms in marine mussels and gastropods". Since November 2008, Tae-Jin started his PhD study and became the first Korean student at SWIMS! He is testing the hypothesis that chemical pollutants can accelerate aging in marine organisms. To do this, Tae-Jin will investigate aging mechanisms in selected marine species, using various aging biomarkers such as telomere length and lipofuscin.

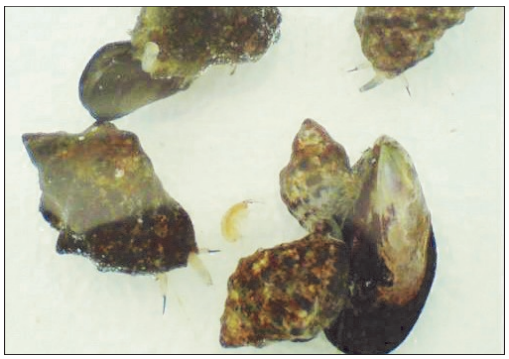
Proteomic responses of marine larvae to climate change

Increasing anthropogenic release of CO_2 is rapidly changing the climate. In the East Asian region, the ecology of coastal ecosystems is expected to experience increasingly-altered pH levels, salinities, as well as temperatures during this century. Kelvin Wong is going to study the effects of these three factors on sensitive early life stages of an ecologically and economically important marine invertebrate, the barnacle *Balanus amphitrite*. Kelvin's work will focus at the proteome (molecular) level to study how sessile invertebrate larvae may be affected by projected future levels of altered environmental conditions.

Kelvin Wong searching for the barnacle, Balanus amphitrite *at a rocky shore in Turtle Cove Bay*

Metal-binding proteins in gastropods

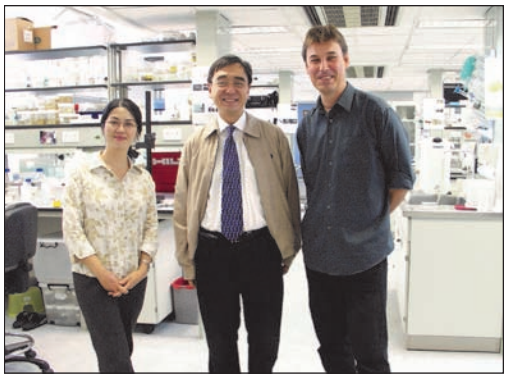
The MPhil research of Lucky Chan evaluates using metal-binding proteins, or metallothioneins (MTs), in the gastropod *Thais clavigera* as a biomarker for metal contamination. MTs consist of various isoforms such as Cu-MT and Cd-MT which play distinctive physiological roles. Lucky has collected *T. clavigera* from different sites during winter and summer. Across all sites, the animals showed a similar level of Cu-MT; however, animals at polluted sites displayed an elevated level of Cd-MT suggesting that Cd-MT may be involved in metal detoxification. Lucky is characterizing other MT isoforms using proteomic approaches and studying the kinetic profile of MTs in *T. clavigera* under different regimes of metal exposure.



Thais clavigera *enjoying a meal of* Septifer virgatus

Research Visitors and Seminars

This year it was a pleasure to host Mr James Adams (Swire group, London) and Ms Natalie Chau (Swire group, Hong Kong) to SWIMS. James was heavily involved in the initial development of SWIMS and so it was particularly enjoyable to show him the new developments and advances that SWIMS has made since 1990. We were also pleased to welcome Deputy Vice Chancellor and Provost Richard Wong for his first visit to SWIMS to tour the facilities and meet with staff and students in June.



DVC Richard Wong touring SWIMS laboratory facilities

Maui de Pirro and Stephen Cartwright monitoring limpet heart rates in the SWIMS aquarium

Prof John Davenport filming porcelain crabs feeding

Rosanna collecting mussels on the shore with Chuen

Prof John Shepherd (Southampton University) visited in April as part of his collaboration with the Swire group on climate change issues. This year, we also welcomed back a number of long-term collaborators including Prof Mark Davies (Sunderland University) and Dr Rick Stafford (University of Gloucestershire) to continue their work on littorinid behaviour; as well as Drs Dave Morritt (University of London) and Maurizio de Pirro (Academy of Environmental Science) to develop their research on the ecophysiology of intertidal animals.

Other visitors came to SWIMS to work on the phylogeny / biogeography of intertidal and subtidal species: Dr David Reid and Martine Clarement (Natural History Museum, London) came to work on neogastropods, whilst Dr Tomoyuki Nakano (Tokyo Museum) worked on local limpet species. In November, Dr Peter Castro visited to use the SWIMS Museum in search of neotypes of lost crab specimens. As part of the *Universitas 21* programme, Dr Bryan Grieg Fry (University of Melbourne) spent 3 weeks at SWIMS collecting octopus specimens as part of his research into the evolution of venom in animals. Prof John Davenport and Dr Julia Davenport (University College Cork, Ireland) stayed for a few weeks as part of their large scale survey of the influences of rock pools on biodiversity and also to work on porcelain crabs.

In addition, we also hosted research students, including Ms Rosanna von Zweigberk (University of Southampton) who completed work for her final year honours project, and Ms Araya Daengroj (King Mongkut's Institute of Technology Ladkrabang) who worked on corals for her higher degree with her supervisor, Dr Monthon Gamanee. Prof Vipoosit Mantachitra (Burapha University, Thailand) also worked at SWIMS on corals with James True.

The SWIMS informal seminar series developed greatly this year with monthly meetings ranging from talks about research methodology and research trips, through to interactive discussions on research ethics and conservation with Claire Nouvian (Bloom Association). A number of SWIMS visitors also gave talks at The University of Hong Kong where they attracted large audiences.

Dr Peter Castro sorting crab samples in the SWIMS Museum

Jay Tung checking his radon detecting equipment

Dr Tomo Nakano collecting limpets in Hong Kong

This year has been a bumper year for hands-on informal workshops teaching different ecological techniques. We are grateful for the engaging and informative sharing of techniques and methods in small workshops led by Mark Davies, Rick Stafford, Dave Morritt and Maui de Pirro. Experimental design and statistical analysis remain key to most ecological experiments and in recognition of this, SWIMS held two very successful 'formal' workshops. Firstly, Prof Dimitry Lajus (St Petersburg State University, Russia) held a one day workshop on fluctuating asymmetry to quantify the effects of stress on aquatic organisms, whilst Dr Lisandro Benedetti-Cecchi (Pisa University, Italy) ran a 4 day workshop on experimental design and data analysis to detect changes in ecological systems. Both these sessions were packed out with colleagues from HKU and also other institutions in Hong Kong, as well as from the region, and proved a very valuable experience to all participants.

David Morritt extracting haemolymph from a limpet

Dimitry Lajus teaching students about fluctuating asymmetry

Community Outreach

As ever, SWIMS was involved with outreach and supporting visits from schools and NGOs. We hosted nearly 500 visitors over the year including secondary school groups, various NGO and Government led visits (e.g., Lions Club, AFCD Marine Parks Ambassador Scheme), as well as students from overseas (e.g. Plymouth University). As always, such visits were carefully coordinated with AFCD. We also provided work experience and internships for students from local and overseas schools, who spent from a few days to two weeks working at SWIMS helping researchers with their projects. SWIMS also supported undergraduate students both in HKU and other institutions via internships, or by providing a research environment for students carrying out their final year projects. This year we were also able to provide facilities for Mr. Jay Tung, from the Physics Department HKU, who is investigating radon levels in the rocks of the Cape d'Aguilar peninsula.

David Reid & Martine Claremont identifying samples

Studensts & staff enjoying a working dinner with Lisandro Benedetti-Cecchi

Vera, Rosanna and Chuen working in the mussel bed during the low summer tides

Research Opportunities

Research Visitors

The Swire Institute of Marine Science offers three major 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 or 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.

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.

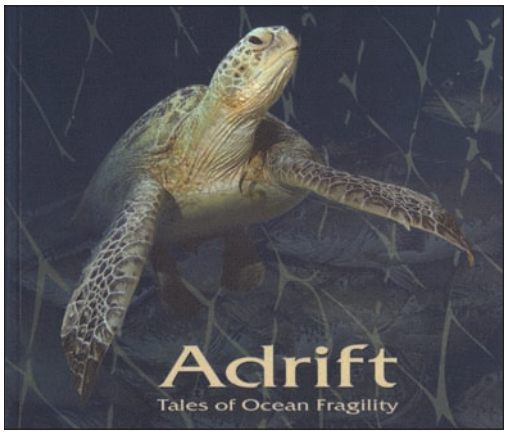
Hong Kong's oldest lighthouse next to the Residence blocks of SWIMS

Accommodation

SWIMS residential blocks are situated on top of the Cape d'Aguilar cliffs. Accommodation at the Residence is available for students, researchers and visitors working at SWIMS. It is also available to outside visitors. Those interested in booking the accommodation, please contact Ms. Sylvia Yiu.

SWIMS and IUCN

2008 was a successful year for the IUCN (International Union for Conservation of Nature) Groupers & Wrasses (fishes) Specialist Group (GWSG) and also for the IUCN Species Survival Commission Marine Conservation Sub-Committee (MCSC). The GWSG held its second major workshop on red-listing of labrids in Brazil. This group, led by Prof Sadovy, also met with the Minister of the Environment to discuss the conservation status of commercial species and the need for sustainable management. The MCSC produced a popular book on problems and solutions in the marine environment, called: 'Adrift, tales of ocean fragility'. The book's release, at the IUCN World Conservation Congress in Barcelona, accompanied by a specially produced video (now popular on YouTube) was met with great enthusiasm.



MCSC publication 'Adrift, tales of ocean fragility'

SWIMS and Reef Check

Reef Check, one of the United Nation's official coral reef monitoring programmes, aims to provide information on temporal trends in the status of coral reefs by collecting ecological information with the help of volunteer divers and scientists. There are, however, certain variables which are difficult to control during these checks, which may make comparison of data problematic. This year the SWIMS Reef Check team decided to test the impacts of different divers' experience and transect allocation on the results of the reef check.

Despite low visibility, the SWIMS team was able to monitor in the coral communities at Siu Long Ke. The team demonstrated significant differences in fish estimation according to different levels of divers' experience, but no significant impact of different transect allocation on live coral coverage estimation. Further investigation and assessment of the effectiveness of Reef Check will be carried out throughout next year. The team also found a decrease in abundance of indicator fishes and invertebrates, especially commercial species, as compared to previous years, perhaps due to the impact of heavy fishing in the coral communities.

The SWIMS Reef Check team 2008

Nudibranch ( ) with egg mass

Juvenile yellow boxfish ( )

SWIMS Publications (Jan. - Dec. 2008)

Bao VWW, Leung KMY, Kwok KWH, Zhang AQ, Lui GCS (2008) Synergistic toxic effects of zinc pyrithione and copper to three marine species: implications on setting appropriate water quality criteria. *Marine Pollution Bulletin* **57**: 616-623

Campagna C, Sadovy de Mitcheson Y, Pilcher N, Hurd A, Griffin J(eds) (2008) Adrift: tales of ocean fragility. *Gland*, Switzerland, 136 pp.

Chan BKK, Murata A, Lee PF (2008) Latitudinal gradient in the distribution of intertidal barnacles of the *Tetraclita* species complex in Asian waters. *Marine Ecology Progress Series* **362**: 201-210

Chan KM, Leung KMY, Cheung KC, Wong MH, Qiu JW (2008) Seasonal changes in imposex and tissue burden of butyltin compounds in *Thais clavigera* populations along the coastal area of Mirs Bay, China. *Marine Pollution Bulletin* **57**: 645-651

Gu J-D (2008) Microbial transformation of organic chemicals in natural environments: the fate of chemicals and the microbial involvement through enrichment culturing techniques. In: Huang QY (ed), Mineral-Organic Matter-Microorganism Interactions. *Springer-Verlag*, New York, pp 175-198

Jones D, Morton B (2008) Barnacles (Crustacea : Cirripedia) from Conic Island Cave, Hong Kong. *Journal of Natural History* **42**: 821-824

Koutsaftis A, Aoyama I (2008) Toxicity of Diuron and copper pyrithione on the brine shrimp, *Artemia franciscana*: The effects of temperature and salinity. *Journal of Environmental Science and Health Part a-Toxic/Hazardous Substances & Environmental Engineering* **43**: 1581-1585

Kwok KWH, BjrgesterA, Leung KMY, Lui GCS, Gray JS, Shin PKS, Lam PKS (2008) Deriving site-specific sediment quality guidelines for Hong Kong marine environments using field-based species sensitivity distributions. *Environmental Toxicology and Chemistry* **27**:226-234

Kwok KWH, Grist EPM, Leung KMY (2008) Acclimation effect and fitness cost of copper resistance in the marine copepod *Tigriopus japonicus*. *Ecotoxicology and Environmental Safety* **72**: 358-364

Kwok KWH, Leung KMY, Bao VWW, Lee JS (2008) Copper toxicity in the marine copepod *Tigriopus japonicus*: low variability and high reproducibility of repeated acute and life-cycle tests. *Marine Pollution Bulletin* **57**: 632-636

Lam K, Leung AWY, Morton B, Hodgson P (2008) A checklist of fish species identified from Conic Island Cave, Hong Kong. *Journal of Natural History* **42**: 967-970

Lam K, Morton B (2008) Soft corals, sea fans, gorgonians (Octocorallia : Alcyonacea) and black and wire corals (Ceriantipatharia : Antipatharia) from submarine caves in Hong Kong with a checklist of local species and a description of a new species of Paraminabea. *Journal of Natural History* **42**: 749-780

Lam K, Morton B, Hodgson P (2008) Ahermatypic corals (Scleractinia : Dendrophylliidae, Oculinidae and Rhizangiidae) recorded from submarine caves in Hong Kong. *Journal of Natural History* **42**: 729-747

Lam K, Morton B, Leung KF (2008) Shell-bearing Mollusca (Bivalvia and Gastropoda) from submarine caves in Hong Kong. *Journal of Natural History* **42**: 927-952

Lau DCP, Leung KMY, Dudgeon D (2008) Experimental dietary manipulations and concurrent use of assimilation-based analyses for effective and accurate elucidation of consumer-resource relationships in tropical streams. *Marine and Freshwater Research* **59**: 963-970

Lau DCP, Leung KMY, Dudgeon D (2008) Experimental dietary manipulations for determining the relative importance of allochthonous and autochthonous food resources in tropical streams. *Freshwater Biology* **53**: 139-141

Lau DCP, Leung KMY, Dudgeon D (2009) What does stable isotope analysis reveal about trophic relationships and the relative importance of allochthonous and autochthonous resources in tropical streams? A synthetic study from Hong Kong. *Freshwater Biology* **54**: 127-141

Leung KMY, Furness RW, Svavarsson J, Lau TC, Wu RSS (2008) Field validation, in Scotland and Iceland, of the artificial mussel for monitoring trace metals in temperate seas. *Marine Pollution Bulletin* **57**: 790-800

Li A-J, Yang S-F, Li X-Y, Gu J-D (2008) Microbial population dynamics during aerobic sludge granulation at different organic loading rates. *Water Research* **42**: 3552 3560

Li H, Gu J-D, Sun H (2008) Structure, topology and assembly of a 32-mer peptide corresponding to the loop 3 and transmembrane domain 4 of divalent metal transporter (DMT1) in membrane-mimetic environments. *Journal of Inorganic Biochemistry* **102**: 1257 1266

Li HY, Lin FJ, Chan BKK, Chan TY (2008) Burrow morphology and dynamics of mudshrimp in Asian soft shores. *Journal of Zoology* **274**: 301-311

Li SW, Chan BKK (2008) Adaptations to barnacle fouling in the mangroves *Kandelia obovata* and *Aegiceras corniculatum*. *Marine Biology* **155**: 263-271

Liu M, Sadovy de Mitcheson Y (2008) Chapter 7: Grouper aquaculture in mainland China and Hong Kong. In: Liao IC, Leao EM (eds) *The Aquaculture of Groupers*. Asian Fisheries Society, Manila, Philippines, World Aquaculture Society, Louisiana, USA, The Fisheries Society of Taiwan, Keelung, Taiwan and National Taiwan Ocean University, Keelung, Taiwan, pp 111-142

Liu M, Sadovy de Mitcheson Y (2008) Profile of a fishery collapse: why mariculture failed to save the large yellow croaker (*Larimichthys crocea*, Sciaenidae). *Fish and Fisheries* **9**: 1-24

Marshall DJ, Santos JH, Leung KMY, Chak WH (2008) Correlations between gastropod shell dissolution and water chemical properties in a tropical estuary. *Marine Environmental Research* **66**: 422-429

Morton B, Bamber RN (2008) The joint Swire Institute of Marine Science, Hong Kong, and Natural History Museum, London, Hong Kong Submarine Caves Expedition, 2002: discussion, conclusions and recommendations for conservation. *Journal of Natural History* **42**: 971-977

Morton B, Bamber RN, Robbins RS (2008) The joint Swire Institute of Marine Science, Hong Kong, and Natural History Museum, London, Hong Kong Submarine Caves Expedition, 2002: introduction. *Journal of Natural History* **42**: 721-728

Rhodes JR, Grist EPM, Kwok KWH, Leung KMY (2008) A Bayesian mixture model for estimating inter-generation chronic toxicity. *Environmental Science & Technology* **42**: 8108-8114

Sadovy Y (2008) Reconciling fisheries with conserving biodiversity. In: Nielsen JL, Dodson JJ, Friedland K, Hamon TR, Musick J, Verspoor E (eds). Reconciling fisheries with conservation: proceedings of the Fourth World Fisheries Congress. *American Fisheries Society*, Symposium 49, Bethesda, Maryland, pp 399-411

Sadovy de Mitcheson Y, Cornish A, Domeier M, Colin P, Russell M, Lindeman K (2008) A global baseline for spawning aggregations of Reef Fishes. *Conservation Biology* **22**: 1233-1244

Sadovy de Mitcheson Y, Liu M (2008) Environmental and biodiversity impacts of capture-based aquaculture. In: Lovatelli A, Holthus PF (eds). Capture-based aquaculture. Global Overview. *FAO Fisheries Technical Paper*. No. 508. Rome, FAO, pp 5-39

Sadovy de Mitcheson Y, Liu M (2008) Functional hermaphroditism in teleosts. *Fish and Fisheries* **9**: 1-43

Sale PF, Butler MJ, Hooten AJ, Kritzer JP, Lindeman KC, Sadovy de Mitcheson Y, Steneck RS, van Lavieren H (2008) Stemming decline of the coastal ocean: rethinking environmental management. United Nations University-INWEH, Hamilton, Canada, 43 pp.

Stafford R, Davies MS, Williams GA (2008) Parameterization and prediction of community interaction models using stable-state assumptions and computational techniques: an example from the high rocky intertidal. *Biological Bulletin* **215**: 155-163

Stafford R, Davies MS, Williams GA (2008) Self-organization of intertidal snails facilitates evolution of aggregation behavior. *Artificial Life* **14**: 409-423

Stauber JL, Binet M, Bao VWW, Boge J, Zhang AQ, Leung KMY, Adams M (2008) Comparison of the QwikLite algal bioluminescence test with marine algal growth rate inhibition bioassays. *Environmental Toxicology* **23**: 617-625

Tsang LM, Chan BKK, Ma KY, Chu KH (2008) Genetic differentiation, hybridization and adaptive divergence in two subspecies of the acorn barnacle *Tetraclita japonica* in the northwestern Pacific. *Molecular Ecology* **17**: 4151-4163

Tsang LM, Chan BKK, Wu TH, Ng WC, Chatterjee, T, Williams GA, Chu KH (2008) Population differentiation of the barnacle *Chthamalus malayensis*: postglacial colonization and recent connectivity across Pacific and Indian Oceans. *Marine Ecology Progress Series* **364**:107-118

Wai TC, Ng JSS, Leung KMY, Dudgeon D, Williams GA (2008) The source and fate of organic matter and the significance of detrital pathways in a tropical coastal ecosystem. *Limnology and Oceanography* **53**: 1479-1492

Wang Y, Yin B, Hong Y-G, Yan Y, Gu J-D (2008) Degradation of dimethyl carboxylic phthalate ester by *Burkholderia cepacia* DA2 isolated from marine sediment of South China Sea. *Ecotoxicology* **17**: 845-852

Yu X, Gu J-D (2008) The role of EDTA in phytoextraction of hexavalent and trivalent chromium by two willow trees. *Ecotoxicology* **17**: 143-152

Yu X, Gu J-D (2008) Effect of available nitrogen on phytoavailability and bioaccumualtion of hexavalent and trivalent chromium in hankow willows (*Salix matsudana Koidz*). *Ecotoxicology and Environmental Safety* **70**: 216-222

Yu X-Z, Gu J-D (2008) Effects of available nitrogen on the uptake and assimilation of ferrocyanide and ferricyanide complexes in weeping willows. *Journal of Hazardous Materials* **156**: 300-307

Yu X, Gu J-D (2008) Differences in uptake and translocation of selenate and selenite by weeping willow and hybrid willow. *Environmental Science and Pollution Research* **15**: 499-508

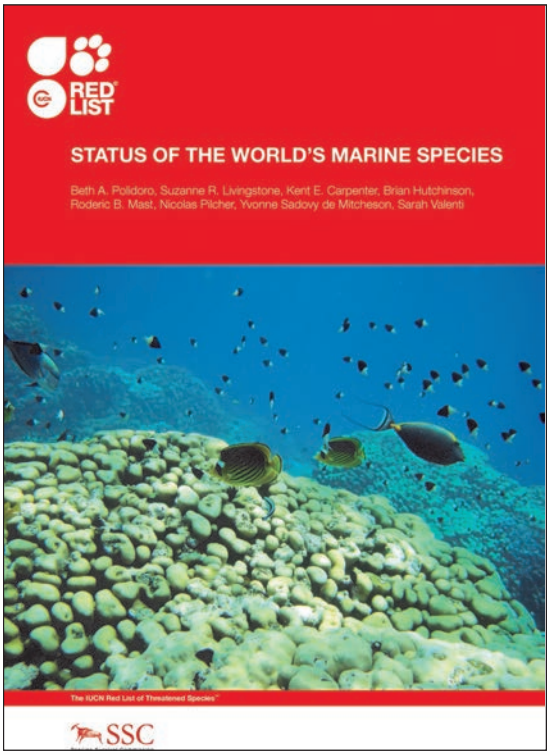
Yu X, Gu J-D, Li T-P (2008) Availability of ferrocyanide and ferricyanide complexes as a nitrogen source to cyanogenic plants. *Archives of Environmental Contamination and Toxicology* **55**: 229-237

Yu X, Gu J-D, Li L (2008) Assimilation and physiological effects of ferrocyanide on weeping willows. *Ecotoxicology and Environmental Safety* **71**: 609-615

Yu X, Gu J-D, Xing L-Q (2008) Differences in uptake and translocation of hexavalent and trivalent chromium by two species of willows. *Ecotoxicology* **17**: 747-755

Yu X, He W, Gu J-D, He M, Yan Y (2008) The effect of chemical cues on settlement of pearl oyster *Pinctada fucata martensii* (Dunker) larvae. *Aquaculture* **277**: 83-91

Zhang AQ, Leung KMY, Bao VWW, Kwok KWH, Lam MHW (2008) Toxicities of Irgarol 1051 and its major degradation product to marine primary producers. *Marine Pollution Bulletin* **57**: 575-586



Newly released IUCN book (co-authored by Prof Yvonne Sadovy de Mitcheson)

Other Contributions from SWIMS

Ji-Dong Gu

Editor/Associate Editor: International Biodeterioration & Biodegradation, Ecotoxicology
Member of Editorial Boards: Biodegradation, Journal of Polymers and the Environment, Microbes and the Environment; Environmental Geochemistry and Health, The Open Proteomics Journal
Ambassador, International Society of Microbial Ecology

Kenny Leung

Member of Editorial Board: Integrated Environmental Assessment and Management; Marine Pollution Bulletin
Member, Environment and Conservation Fund (ECF) Research Projects Vetting Subcommittee
Member, Marine Mammal Conservation Working Group
Member, Society of Environmental Toxicology and Chemistry (SETAC) Asia/Pacific Board of Directors
Council member & Librarian, MBAHK

Liu Min

Member, IUCN Specialist Group of Groupers and Wrasses
Mainland China Coordinator, Reef Check Foundation

Yvonne Sadovy

Chair (and founder): IUCN World Conservation Union Specialist Group of Groupers and Wrasses (www.humpheadwrasse.info)
Director (and founding member): Society for the Conservation of Reef Fish Aggregations (www.scrfa.org)
Member: Steering Committee of the IUCN Species Survival Commission
Co-Chair: Marine Conservation Sub-Committee of the IUCN Species Survival Commission
Member: Scientific Advisory Committee-Palau International Coral Reef Centre (PICRC)
Editorial Boards: Conservation Biology; Reviews in Fish Biology and Fisheries; Fish and Fisheries, Journal of Fish Biology
Chair, Conservation Projects Committee: World Wide Fund for Nature Hong Kong (WWF HK)

V Thiyagarajan

Editor (review), Aquatic Biology, Inter-Research Journal
Member, Human Proteome Organization
Member, Hong Kong Proteomics Society

James True

Gray A Williams

Secretary, Pacific Institutes of Marine Science
Postgraduate Advisor, King Mongkut's Institute of Technology Ladkrabang, Thailand

Cynthia Yau

Member, Cephalopod International Advisory Council

Conferences and Workshops

Cheung Ma Shan Michelle

Poster Presentation; A Joint MMS Workshop on Marine Environmental Research, 7-10 Jan. 2008, The University of Hong Kong, Hong Kong.

Ji-Dong Gu

Deputy Director; Croucher Advanced Study Institute on Innovation Technologies for Soil Remediation, 1-6 Dec. 2008, Hong Kong Baptist University, Hong Kong.
Co-Organizer and Oral Presentation; The 2nd International Workshop on Environmental Health and Pollution Control, 18-23 Oct. 2008, Nanjing, China.
Oral Presentation; The 3rd International Symposium on Environment, 22-25 May 2008, Athens, Greece.
Oral Presentations; IATA Aviation Fuel Forum, 20-22 May 2008, Athens, Greece.
Chair; Microbial Influenced Corrosion Session (TEG 187X), Corrosion/2008, 16-20 Mar. 2008, New Orleans, Louisiana, USA.

Kenny Leung

Invited Plenary Address; The 1st International Conference on Environmental Health Science in Seoul, Korea, 30 Oct. 2008, Seoul, Korea.
Oral & Poster Presentations; The 5th SETAC (Society of Environmental Toxicology and Chemistry) World Congress, 3-7 Aug. 2008, Sydney, Australia.
Organizer & Co-teacher; A Workshop on the Theory and Application of Fluctuating Asymmetry for Quantification of Effect of Stress on Aquatic Organisms, 4 Mar. 2008, The Swire Institute of Marine Science, Hong Kong.
Oral & Poster Presentations; A Joint MMS Workshop on Marine Environmental Research, 7-10 Jan. 2008, The University of Hong Kong and City University of Hong Kong, Hong Kong.
Organizer & co-teacher: A Short Course on Practical Concepts and Tools for Discerning Cause and Risk in the Presence of High Uncertainty, at the 5th SETAC World Congress, 3 Aug 2008, Sydney, Australia.
Organizer & Instructor: A Workshop on Statistical Design and Analysis for Environmental Water Monitoring and Sampling for Environmental Protection Officers, 9, 12 & 19 Dec 2008, the University of Hong Kong, Hong Kong.

Liu Min

Workshop on Global Red List Assessments of Wrasses (Family Labridae), 3-8 Dec. 2008, Tamandare, Brazil.
Oral Presentation; Lin Feng Forum, 7-9 Apr. 2008, Xiamen University, China.
Poster Presentation; A Joint MMS Workshop on Marine Environmental Research, 7-10 Jan. 2008, The University of Hong Kong, Hong Kong.

Ng Wai Chuen

Oral Presentation; A Joint MMS Workshop on Marine Environmental Research, 7-10 Jan. 2008, The University of Hong Kong, Hong Kong.

V Thiyagarajan

Invited Speaker; Symposium on Tidal Flats, 25-27 Nov. 2008, Nagasaki University, Japan.
Invited Speaker; 8th Larval Biology Symposium, 6-11 July 2008, University of Lisbon, Portugal.

Yvonne Sadovy

Co-Organizer; Workshop on Global Red List Assessment of Wrasses (Family Labridae), 3-8 Dec. 2008, Tamandare, Brazil.
Keynote Speaker; Ministry of the Environment, Regional Symposium on Groupers, 25-28 Nov. 2008, Abu Dhabi, UEA.
Mini-Symposium Co-Organizer; Gulf and Caribbean Fisheries Institute Annual Meeting, November 2008, Guadeloupe.
Guest Speaker; Spawning Aggregation Conference and Conservation Meeting, 27-30 Oct. 2008, La Paz, Mexico.
Guest Speaker; FAO-WECAFC Nassau Grouper Workshop, 17-19 Oct. 2008, Cartagena, Colombia.
Session Co-Organizer; UNCN World Conservation Congress, 4-10 Oct. 2008, Barcelona, Spain.

James True

Invited speaker; The Andaman Bioregion of Thailand: providing linkages between Asian and Indo-Australia, FORTROP II: International Conference on Tropical Forestry Change in a Changing World, Nov. 2008, Bangkok, Thailand.
Invited speaker; The Andaman Bioregion of Thailand: A Potential World Heritage Area, Open Meeting Concerning the Status of The Andaman Marine Portected Areas, Oct. 2008, Bangkok, Thailand.
Invited Speaker; Evaluation of artificial reefs, Workshop for the formulation of Thailand's National Artificial Reefs Master plan, 19 Feb. 2008, Bangkok, Thailand.

Wai Tak Cheung

Guest speaker; Public lecture "Soft shore ecology and biodiversity in Hoi Ha Wan Marine Park", Agriculture, Fisheries and Conservation Department, Hong Kong SAR Government, 18 Aug. 2007, Hong Kong.

Gray A Williams

Oral Presentation; LIPI-NaGISA Western Pacific Conference, 27-29 Oct. 2008, Jakarta, Indonesia.
Invited Speaker; 7 Oct. 2008, Ocean University, Qingdao, China.
Invited Speaker; 25 Sept. 20008, State Key Laboratory, Xiamen University, China.
Invited Speaker and Co-Chair Organizing Committee, A Joint MMS Workshop on Marine Environmental Research, 7-10 Jan. 2008, The University of Hong Kong, Hong Kong.

Cynthia Yau

Oral Presentation; 8th Larval Biology Symposium, 6-11 July 2008, University of Lisbon, Portugal.

Postgraduates

William But

Poster Presentation; 11th International Coral Reef Symposium, 7-11 July 2008, Fort Lauderdale, Florida, USA.

Stephen Cartwright

Poster Presentation; A Joint MMS Workshop on Marine Environmental Research, 7-10 Jan. 2008, The University of Hong Kong, Hong Kong.

Kiki Khangura

A Joint MMS Workshop on Marine Environmental Research, 7-10 Jan. 2008, The University of Hong Kong, Hong Kong.

Stanley Shea

Poster Presentation; New Zealand Marine Sciences & Australian Marine Sciences Joint Conference 2008, 7-10 July 2008, New Zealand.

Shadow Sin

Poster Presentation; New Zealand Marine Sciences & Australian Marine Sciences Joint Conference 2008, 7-10 July 2008, New Zealand.

Ricky Tang

Oral Presentation; 8th Larval Biology Symposium, 6-11 July 2008, University of Lisbon, Portugal.

Allen To

Poster Presentation; A Joint MMS Workshop on Marine Environmental Research, 7-10 Jan. 2008, The University of Hong Kong, Hong Kong.

Stella Wong

Summer Course on Ecotoxicology, 30 June-11 July 2008, Xiamen, China.
A Joint MMS Workshop on Marine Environmental Research, 7-10 Jan. 2008, The University of Hong Kong, Hong Kong.

Jamius Yeung

Poster Presentation; The 5th SETAC (Society of Environmental Toxicology and Chemistry) World Congress, 3-7 Aug. 2008, Sydney, Australia.
Summer Course on Ecotoxicology, 30 June-11 July 2008, Xiamen, China.

Student Graduations

Ph.D

Chan Hoi Lam (2008) - Supply-side ecology and onshore selection of *Tetraclita japonica japonica* (Crustacea: Cirripedia) in Hong Kong.
Lau Chun Pong (2008) - Applications of stoichiometry, stable isotopes, and fatty acids for elucidating the relative importance of allochthonous and autochthonous resources in Hong Kong streams.
Pan Li (2008) - The *Vibironaceae* horizontal gene pool: plasmid replication and identification.
Shen Pingping (2008) - Benthic infaunal community at an intertidal mudflat and molecular analysis of the dominant species *Neanthes glandicincta* (polychaeta).
Yu Xiao-Zhang (2008) - Uptake, assimilation and toxicity of cyanogenic compounds in plants.

M.Phil

Fok Man Sze (2008) - Baseline survey of fish juvenile assemblages in Tolo Harbour and Channel, Hong Kong.

Staff Training

Ms. Sylvia Yiu has attended the New Web-based Receipt System on 25 January 2008 (AM) & 29 January 2008 (PM).

Experimental design and data analysis to detect natural and human-induced changes in ecological systems

Workshop attendees

Mr. William But
Mr. Stephen Cartwright
Mr. Lucky Chan
Dr. Michelle Cheung
Ms. Vivian Fu (SBS, HKU)
Ms. Becky Gao (SBS, HKU)
Dr. Billy Hau (SBS, HKU)
Ms. Hui Yuk Ling (CUHK)
Mr. Tony Hung (SBS, HKU)
Ms. Kiki Khangura
Dr. Apostolos Koutsaftis
Ms. Vivian Lam
Dr. Danny Lau (SBS, HKU)
Mr. Dickey Lau (HKBU)
Ms. June Leung
Mr. Leung Yu Sing (City U HK)
Ms. Li See Wai (City U HK)
Dr. Liu Min
Ms. Angie Ng (SBS, HKU)
Ms. Lily Ng (SBS, HKU)
Ms. Maria Lo (SBS, HKU)
Dr. Ng Wai Chuen
Ms. Sophia Niu (SBS, HKU)
Mr. Park Tae Jin
Mr. Stanley Shea
Ms. Shadow Sin
Mr. Sin Yung Wah (CUHK)
Mr. Sung Yik Hei (SBS, HKU)
Mr. Ricky Tang
Mr. Allen To
Dr. James True
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Dr. Wai Tak Cheung
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Ms. Stella Wong
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The theory and application of fluctuating asymmetry for quantification of effect of stress on aquatic organisms

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Mr. Stephen Cartwright
Ms. Chen Yan (City U HK)
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Mr. Bill Yip (City U HK)
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Mr. James Adams (Swire group)
Ms. Natalie Chau (Swire group)
Mr. Wong Yue Chim (VCO, HKU)
Ms. Flora Mok (HKUST)
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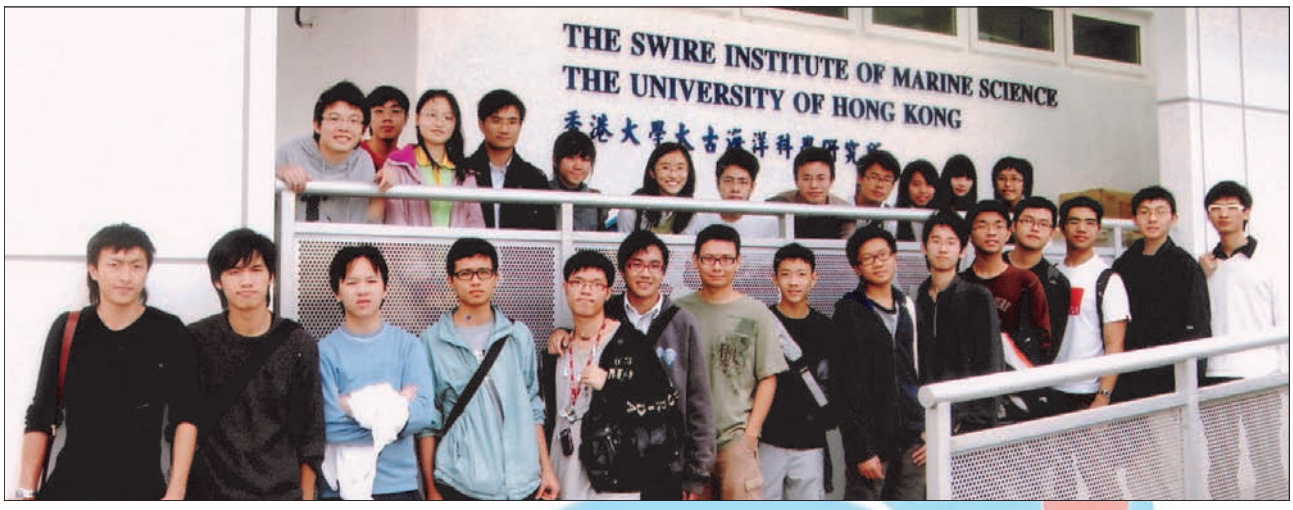
Institutional abbreviations:
AFCD - Agriculture, Fisheries and Conservation Department; **CUHK** - Chinese University of Hong Kong; **CNN** - Cable News Network; **City U HK** - City University of Hong Kong; **HKBU** - Hong Kong Baptist University; **HKUST** - Hong Kong University of Science and Technology; **MEL** - State Key Laboratory of Marine Environmental Science, Xiamen University, China; **OPCFHK** - Ocean Park Conservation Foundation Hong Kong; **WIS** - West Island School.

Group Visits
31 students from Biological Oceanography class, HKU, Dec. 2007
45 members from Lions Club, Jan. 2008
26 students from Coastal Ecology, HKU, Jan. 2008
3 staff and 19 students from Plymouth University, UK, Mar. 2008
1 staff and 15 students from Plymouth University, UK, Mar. 2008
1 staff and 10 students from Plymouth University, UK, Mar. 2008
1 staff and 10 students from Plymouth University, UK, Mar. 2008
25 students from Coastal Ecology, HKU, Apr. 2008
2 staff and 36 students from South Island School, June 2008
40 staff and students from South Island School, June 2008
45 members from AFCD Marine Parks Ambassador Scheme, July 2008
40 young ambassadors from The Hong Kong Federation of Youth Groups, July 2008
2 staff of AFCD and 18 secondary school teachers from AFCD Marine Park Teachers' Workshop, Aug. 2008
3 staff and 39 students from King George V School, Oct. 2008
43 students from Biological Oceanography class, HKU, Nov. 2008



Chuen with young ambassadors from The Hong Kong Federation of Youth Groups

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Ms. Suzanne Gendron, Mr. Timothy Ng and staff, Ocean Park Conservation Foundation Hong Kong

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