The background of the slide features a vibrant underwater coral reef scene. The water is a clear turquoise color, and the reef itself is composed of various types of coral, including large, textured structures and smaller, more delicate species. Sunlight filters down from the surface, creating a dappled light effect on the coral and the sandy ocean floor.

Coral Protection and Management: Hong Kong Experiences

珊瑚保護與管理:香港經驗

Dr. CHAN Lai, LEO (陳荔)

Associate Director of State Key Laboratory of Marine Pollution
香港城市大學海洋污染國家重點實驗室副主任

Director of Shenzhen Key Laboratory for the Sustainable Use of Marine Biodiversity
深圳海洋生物多樣性可持續利用重點實驗室主任



Let's Explore Ocean

Open Water Scuba Instructor (開放水域水肺潛水員教練)

Emergency First Response Instructor (緊急第一反應教練)

Underwater Criminal Investigator (水下罪案調查員)

Public Safety Diver Instructor (公共安全潛水員教練)

Closed-Circuit Rebreather Diver (閉路式循呼吸器潛水員)

Technical Diver (技術潛水員) and Reef Check EcoDiver (珊瑚調查生態潛水員)

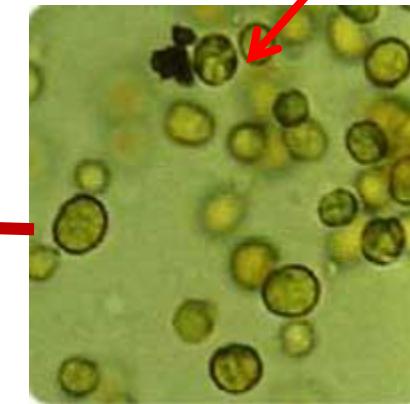
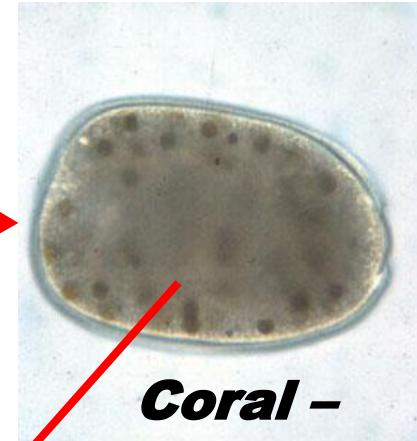
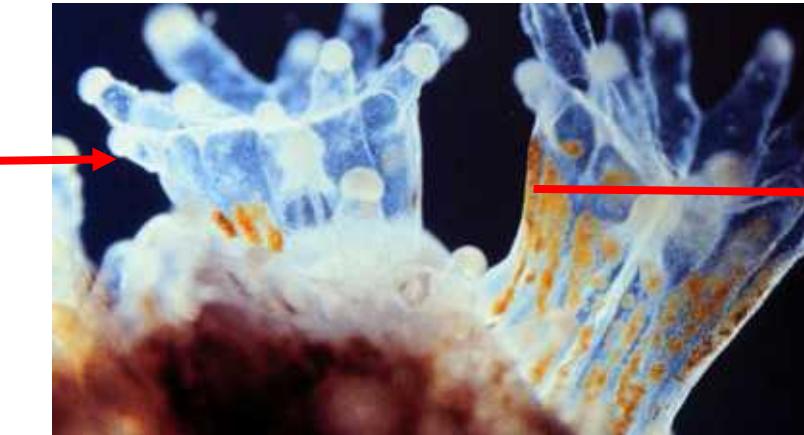
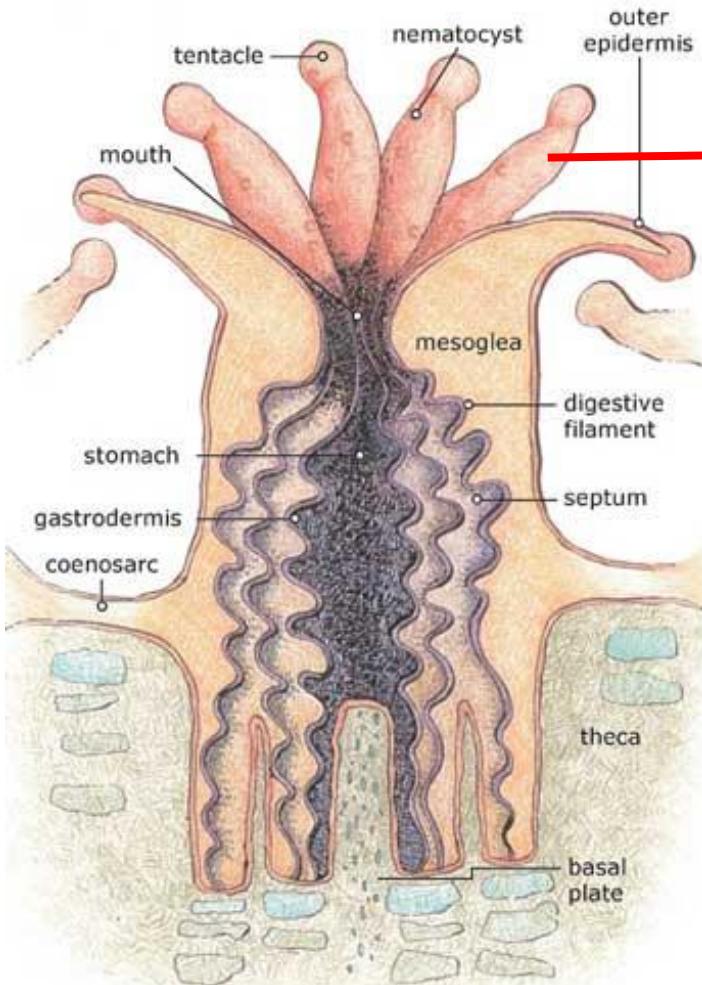
Coral reefs

珊瑚礁

- 284,300 square kilometers;
 - 28.43萬平方公里;
- Less than 0.2% of the ocean
 - 不到0.2%的海洋

Coral reefs

- Reef-building corals have a symbiotic relationship with unicellular algae (zooxanthellae)



Zooxanthellae

Zooxanthellae

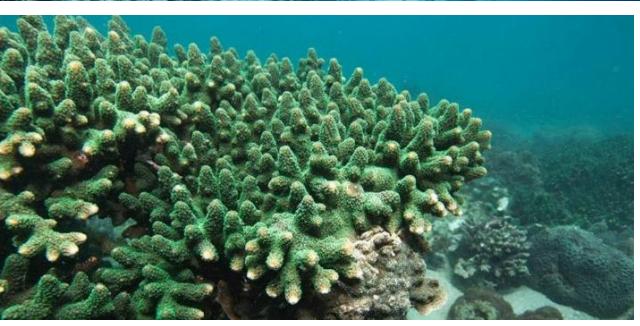
Reef building coral

Source: Mark Eakin Coordinator, NOAA Coral Reef Watch
Photo: Michael ten Lohuis



Coral reefs ecosystems

珊瑚礁生態系統





Coral reefs ecosystems

珊瑚礁生態系統

- **The most important marine habitat that supports one third of all described marine species. (Hoegh-Guldberg, 1999)**
- 為已被描述的三分之一的海洋物種提供最重要的海洋棲息地。



Over 250 species of Fishes identified at all levels of the Food Chain





Coral reefs ecosystems

珊瑚礁生態系統

- **Oasis in the desert Ocean: High productivity**
- 海洋中的綠洲：高生產力





Coral reefs ecosystems

珊瑚礁生態系統

- **Support the livelihood of millions of people who live along the coast in tropical areas. (Moberg and Folke, 1999)**
- 為數百萬居住在熱帶沿海地區的人口提供生計。



珊瑚礁的價值

The Value of Coral Reefs

Coral reefs have a value of \$9.9 trillion USD globally and are relied upon by at least 500 million people.

珊瑚礁在全球的價值為9.9萬億美元，至少有5億人賴以維持生計。

醫學 MEDICINE

more than half of all new cancer drug research focuses on marine organisms

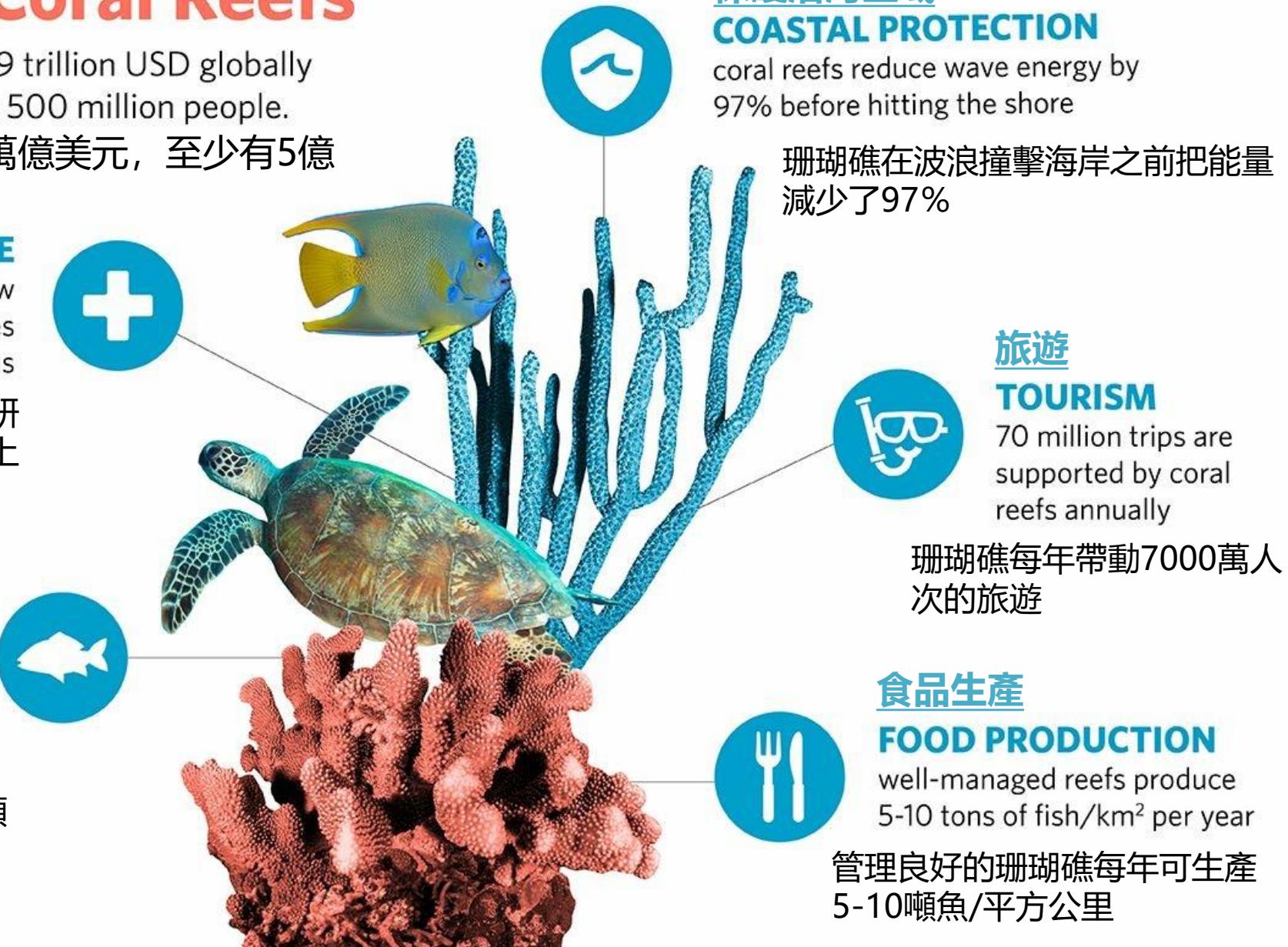
有一半以上的新抗癌藥物研究都集中在海洋生物上

生物多樣性

BIODIVERSITY

coral reefs cover <1% of the Earth's surface but are home to 25% of all marine fish species

珊瑚礁覆蓋地球表面少於1%，但是提供住所給25%的海洋魚類



保護沿海區域

COASTAL PROTECTION

coral reefs reduce wave energy by 97% before hitting the shore

珊瑚礁在波浪撞擊海岸之前把能量減少了97%

旅遊

TOURISM

70 million trips are supported by coral reefs annually

珊瑚礁每年帶動7000萬人次的旅遊

食品生產

FOOD PRODUCTION

well-managed reefs produce 5-10 tons of fish/km² per year

管理良好的珊瑚礁每年可生產5-10噸魚/平方公里

Coral Communities

- **Corals in Hong Kong do not form extensive coral reefs, instead we have coral communities, which grow directly on rock, rather than on an accumulated platform of calcium carbonate;**
- **84 species of stony corals have been recorded ~ 10% of all stony corals in the world!**



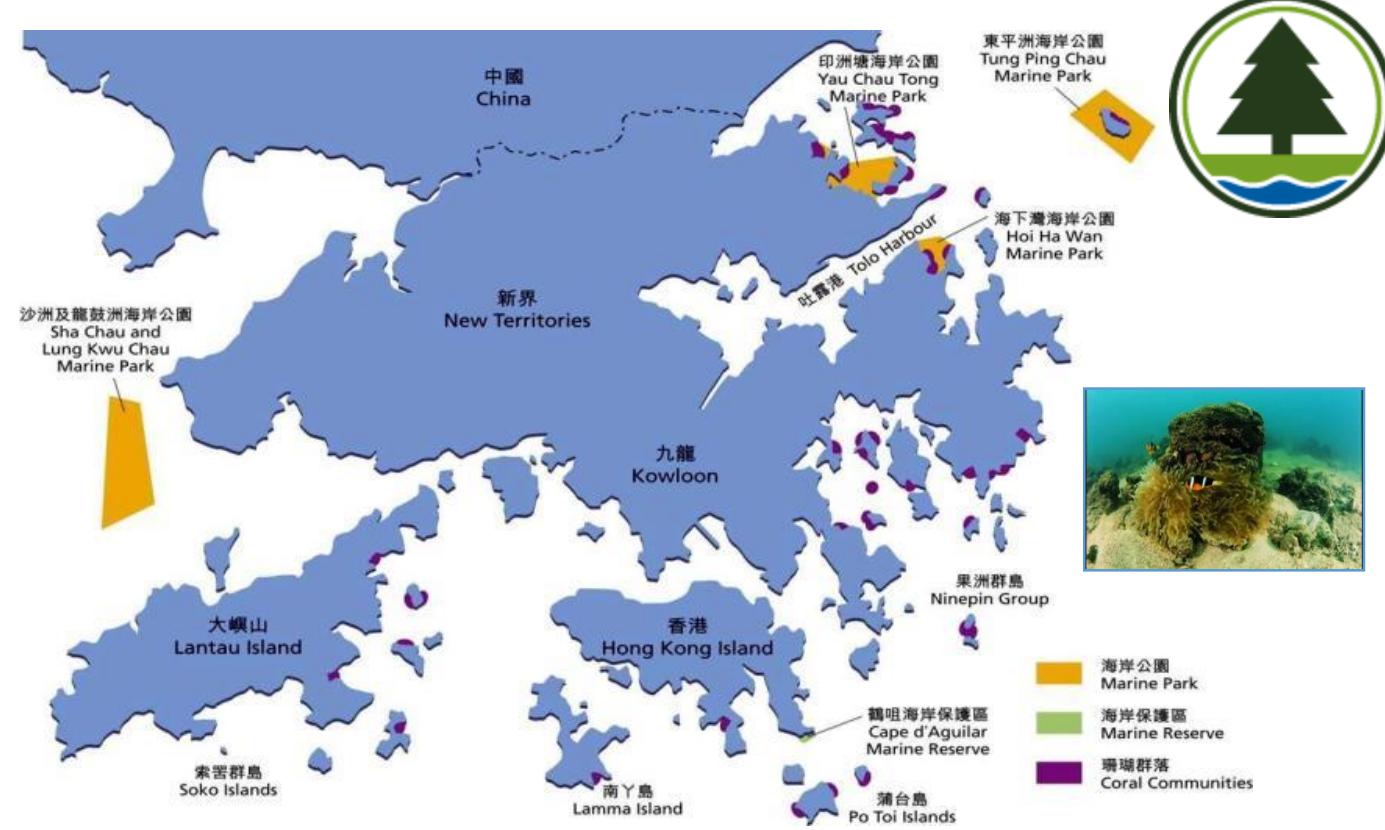
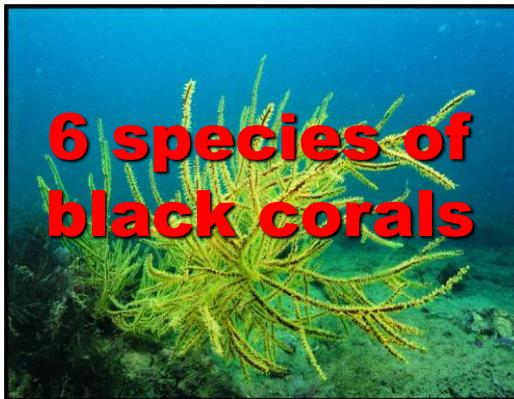
Conditions of coral communities in Hong Kong

Coral coverage:

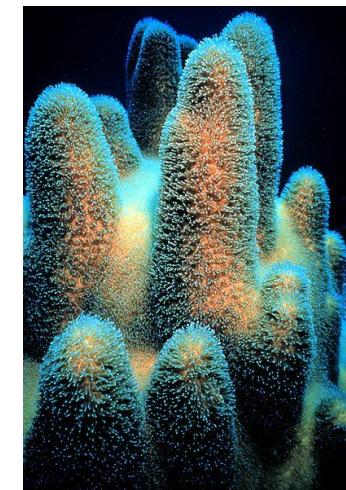
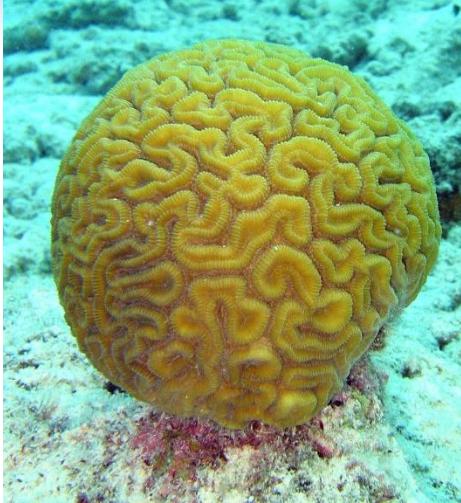
Eastern waters: 21.9% - 79.4%;

**Southern waters: relatively low.
with minor and localized coral
bleaching**

(AFCD Reef Check Report)

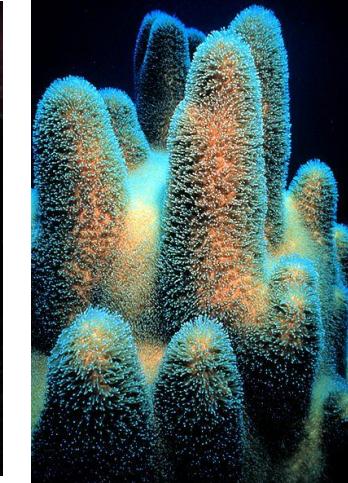






Ocean Acidification 海洋酸化

Global Warming 全球暖化



Pollution 污染



Global Warming 全球暖化



Healthy - Dec 2014



Dying - Feb 2015



Dead - Aug 2015

Ocean Acidification 海洋酸化

Pollution 污染



Global Warming 全球暖化



Ocean Acidification 海洋酸化

Pollution 污染

Live Reef Food Fish Trading (LRFFT)

- The Live Reef Food Fish Trade involves the capture of reef fish which are kept alive for sale and consumption;
- Annual regional trade and catch in live reef food fish in the Asia-Pacific region is estimated around **US\$ 810 million** and **30,000 metric tons** respectively;
- In some high production areas the **actual yield** of live reef fish is more than **twice** that which scientists say **reefs can sustain**.



Common live coral reef food fish species in Hong Kong

香港常見進口珊瑚礁可食用魚類品種



Plectropomus leopardus (leopard coral grouper)



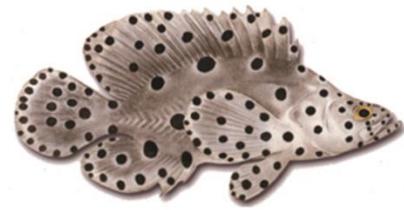
Plectropomus areolatus (areolated coral grouper)



Epinephelus fuscoguttatus (Brown-marbled grouper)



Epinephelus lanceolatus (giant grouper)



Cromileptes altivelis (humpback grouper)



Epinephelus polyphekadion (camouflage grouper)



Variola louti (yellow-edged lyretail)



Cheilinus undulatus (humphead wrasse)



Lutjanus bohar (two-spot red snapper)



Gymnothorax spp. (moray eel)



Lutjanus argentimaculatus (mangrove red snapper)

- long-lived (up to several decades)
- often late to mature and reproduce

- As much as 50% of reef fish are being taken from the water before they have had an opportunity to reproduce:
 - These fish are 'grown out' in cages until they reach market size, a practice that will be disastrous in the long term;
 - Caged fish don't contribute to replenishing wild stocks and high rates of extraction of live fish are already resulting in fishing down the food chain, with unknown long-term ecosystem impacts

This makes groupers particularly vulnerable to fishing

Over-harvesting 過度捕撈

Global Warming 全球暖化

Ocean Acidification 海洋酸化

Pollution 汚染



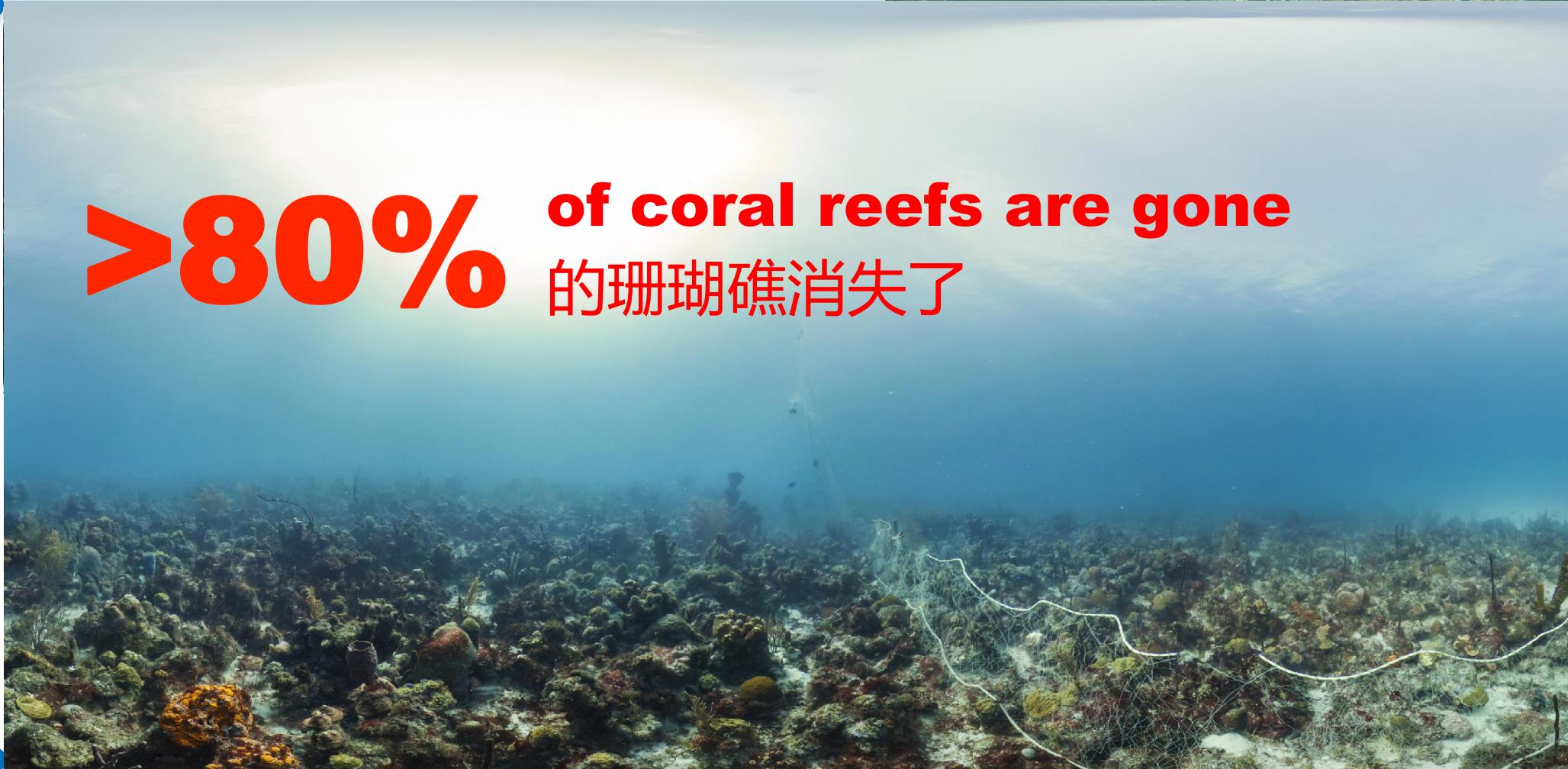
Over-harvesting 過度捕撈

Global Warming 全球暖化

Ocean Acidification 海洋酸化

>80%

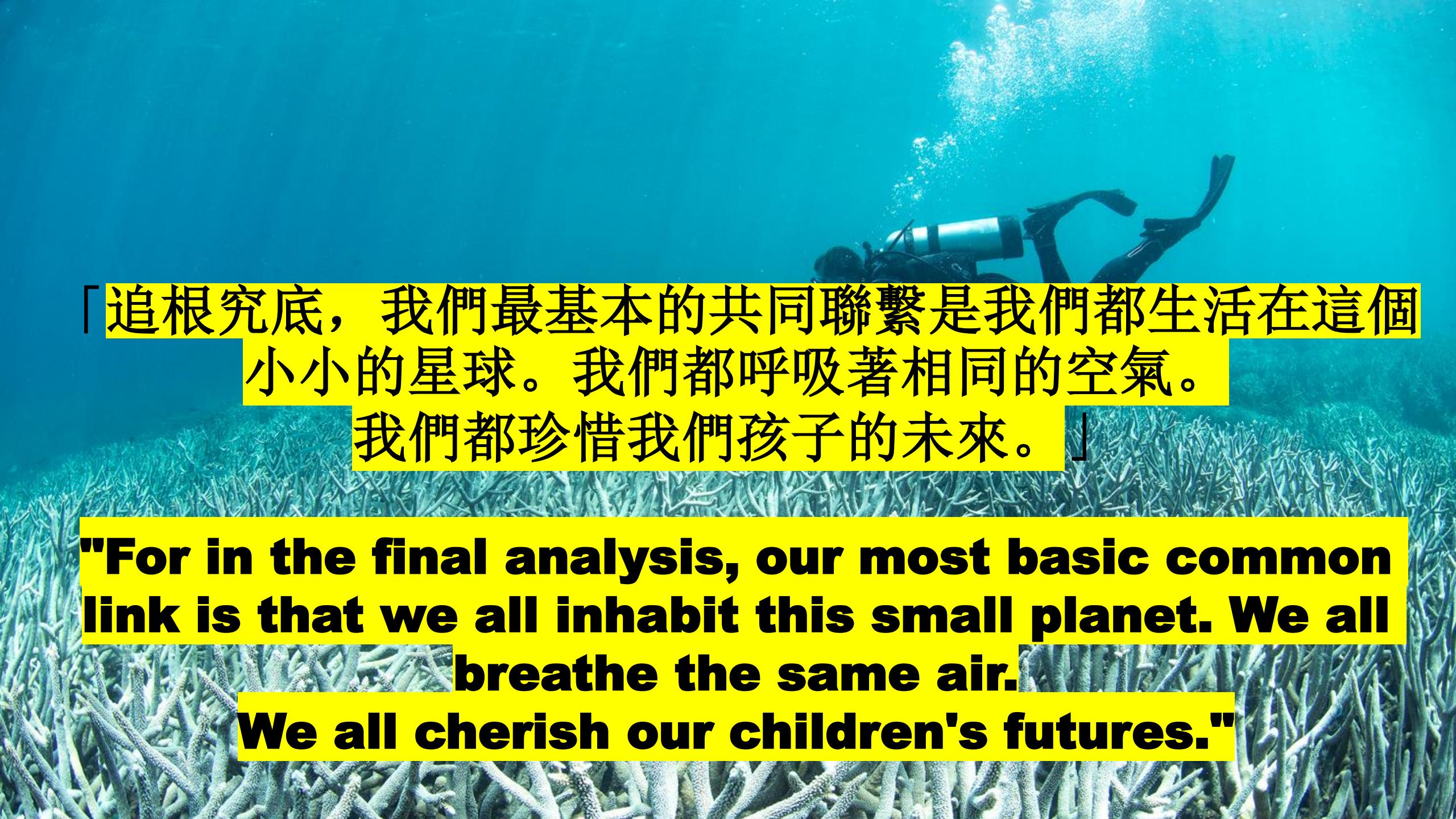
of coral reefs are gone
的珊瑚礁消失了



Pollution 污染





A photograph of a scuba diver swimming over a coral reef. The diver is wearing a black wetsuit and fins, and is holding a scuba tank. Bubbles are rising from the diver's mouthpiece. The water is clear blue, and the coral reef is visible at the bottom.

「追根究底，我們最基本的共同聯繫是我們都生活在這個
小小的星球。我們都呼吸著相同的空氣。
我們都珍惜我們孩子的未來。」

"For in the final analysis, our most basic common link is that we all inhabit this small planet. We all breathe the same air. We all cherish our children's futures."

Protect and Conserve Hong Kong Corals



- **The Agriculture, Fisheries and Conservation Department of the Hong Kong SAR Government has put in place a series of measures and programmes to conserve the marine environment and protect the coral communities in Hong Kong;**
- **These measures and programmes include designation of six Marine Parks and one Marine Reserve in Hong Kong; coordinating the annual Hong Kong Reef Check; organising marine conservation education activities; and undertaking ecological surveys at coral sites to provide information for sound and adaptive management.**

Designation Criteria

- **Diversity**
- **Uniqueness of marine resources**
- **Naturalness**
- **Value for education and conservation**
- **Ease of enforcement**





No-anchoring area 不宜碇泊區

- Specially-designed marker buoys were installed at Sharp Island, Sharp Island East, Port Island, Bluff Island, South Ninepin and Shelter Island for better protection of coral from anchor damages**
- 於橋咀洲、橋咀洲東、赤洲、沙塘口山、南果洲和牛尾洲設置了特別設計的珊瑚標誌浮標
- Leaflets and posters on “No-anchoring area” and stickers on “Codes for visiting coral areas” have been published and distributed to the boaters and divers through various channels**
- 印製了有關“不宜碇泊區”的單張和海報，以及《暢遊珊瑚區守則》貼紙，並已通過各種管道分發給駕駛船隻和潛水人士



漁農自然護理署
Agriculture, Fisheries and
Conservation Department

Protect and Conserve Hong Kong Corals

Coral Study

- Completed a territory-wide coral study and set up a database on corals in 2004;
- Produced a coral field-guide;
- Established a coral reference collection for education and publicity purposes.





香港城市大學
City University of Hong Kong



Provision of Consultancy Services for a study of reef fish diversity in Hong Kong (香港珊瑚魚多樣性顧問項目)

- Conduct first survey of Hong Kong's reef fish that covers a comprehensive area employing consistent methodologies** 對香港珊瑚魚進行首次調查，涵蓋採用一致方法的綜合區域
- 26 major reef areas in Hong Kong over 24 month period** 香港26個主要珊瑚礁地區維時超過24個月
- 8 quarterly surveys and 2 surveys per season (wet and dry)** 進行8次季度調查和2次時節調查（幹和濕）
 - quarterly-control sites and sites in marine parks and reserves (12 sites)**
 - 季度調查-海岸公園及保護區內的管制地點及地點（12個地點）
 - seasonal-all 26 major reef areas**
 - 時節調查-所有26個主要珊瑚礁區域



Figure 1 Twenty-six (26) survey sites of this Reef Fish Diversity study in Hong Kong

1. A Ye Wan 阿爺灣
2. A Ma Wan 阿媽灣
3. Cheung Shek Tsui 長石咀
4. Wu Pai 烏排
5. Kau Ma Shek 狗麻石
6. Au Yue Tsui 勁魚咀
7. Wong Chuk Kok Hoi 黃竹角海
8. Port Island 赤洲
9. Kung Chau 弓洲
10. Tap Mun 塔門
11. Gruff Head 韶螺角
12. Coral Beach 珊瑚灘
13. Tsim Chau 尖洲
14. Long Ke 浪茄
15. East Dam 東壩
16. Pak Lap Tsai 白臘仔
17. Pak A 北丫
18. Sharp Island, North 橋咀北
19. Sharp Island, East 橋咀東
20. Shelter Island 牛尾洲
21. Lobster Bay 龍蝦灣
22. Bluff Island 騭虹灣
23. Po Yue Pai, Basalt Island 火石洲蒲魚排
24. Ninepin Island, South 南果洲
25. Site 1, Cape d'Aguilar 鶴咀 1
26. Site 2, Cape d'Aguilar 鶴咀 2



香港珊瑚魚多樣性

- 共錄得 **287** 個品種及**201,837**條個體
- 當中**14**種於所調查有地點和所有調查季度均有記錄



石狗公
False kelpfish



大炮流蘿
Doublebar cardinalfish



石剝
Bengal sergeant



沙鯷
Fan-bellied leatherjacket



印度銜鰐虎魚
Spectacled sandgoby



華麗銜鰐虎魚
Decorated goby



烏絲
Chocolate hind



雙帶副緋鯉
Pointed Goafish

相對數量 81%

相對數量 45.19%



黃尾石剝
Chinese demoiselle



藍石剝
Pearl-spot chromis



藍黑新雀鯛
Regal demoiselle



泥鰌
White-spotted spinefoot



蠣妹
Bubblefin wrasse



連米
Common silver-biddy

Species of special concern 特別品種



Japanese seahorse 日本海馬 (*Hippocampus mohnikei*)

- Vulnerable species in IUCN Red List
國際自然保護聯盟《瀕危物種紅色名錄》中的易危物種
- A mature individual found in Pak Lap Tsai
在白臘仔發現一個成熟個體
- First official record in Hong Kong and South China
首次在香港和華南地區有正式記錄
- This record bridges the population in Japan and South East Asia
該記錄連接了日本和東南亞的群落

Spotted seahorse 管海馬 (*Hippocampus kuda*)

- Vulnerable species in IUCN Red List
國際自然保護聯盟《瀕危物種紅色名錄》中的易危物種
- 11 individuals found in seven locations
在七個地點共發現11個個體
- Seven individuals found in Yan Chau Tong Marine Park and Tung Ping Chau Marine Park
其中七個個體在印洲塘海岸公園和東平洲海岸公園發現
- Both juvenile and mature individuals are found
幼年和成熟個體均有發現

Species of special concern 特別品種



Hong Kong grouper 赤點石斑 (*Epinephelus akaara*)

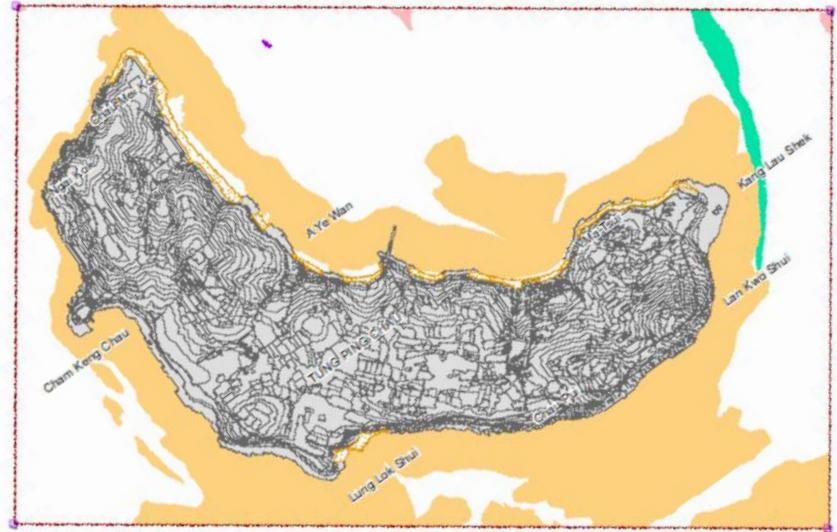
- Endangered species in IUCN Red List
國際自然保護聯盟《瀕危物種紅色名錄》中的瀕危物種
- One adult and one juvenile found in East Dam and Long Kei respectively
分別於東壩及浪茄發現一條成熟個體及幼體



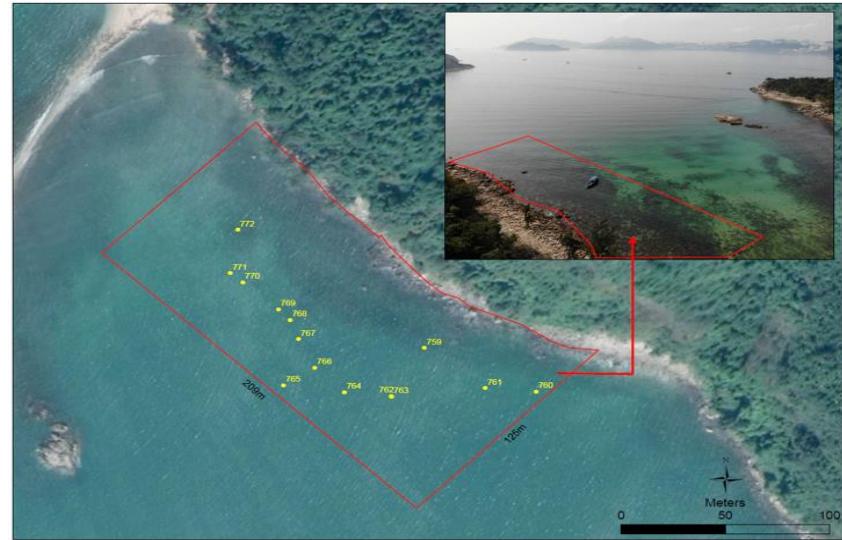
Sabah grouper 沙巴龍臺 (*Epinephelus lanceolatus x E. fuscoguttatus*)

- Invasive species, fast growth rate with large body size
外來入侵品種，體型大及生長速度快
- Apex predator outcompeting with other predators
為頂級掠食者，容易淘汰其他捕食者
- Eight records from six sites, ranged from 23 to 80cm
於六個地點中錄得八個記錄，大小從23到80釐米不等
- Suspected to be escaped from fish farm or religious release
懷疑從養魚場逃脫或宗教放生活動野放

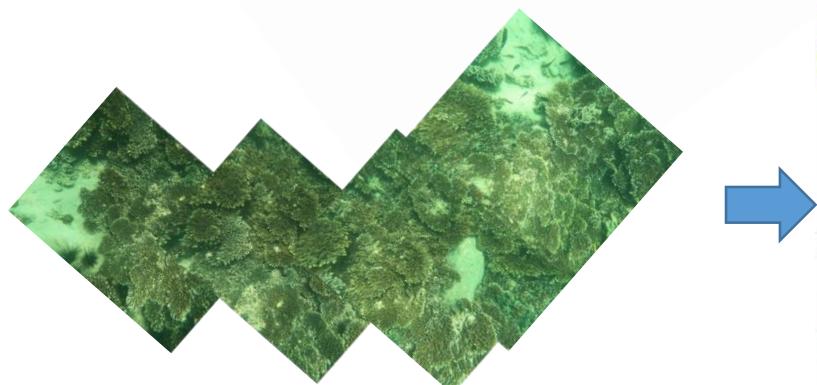
承擔香港漁農自然護理署3項顧問項目，基於科學潛水的水下調查及水面船載聲學與光學技術，分別對香港東平洲與橋咀北海岸公園，開展繪圖工作及珊瑚健康監測調查，對棲息地三維實景測繪進行了探索。



為東平洲海岸公園提供底棲生境測繪顧問服務



為橋咀北海岸公園提供底棲生境測繪顧問服務



珊瑚區域的2D鑲嵌圖像



珊瑚區域的3D模型



提供水下棲息地監測顧問服務

Acoustic Survey 聲學調查



Illustration of swath bathymetry systems



MBES device

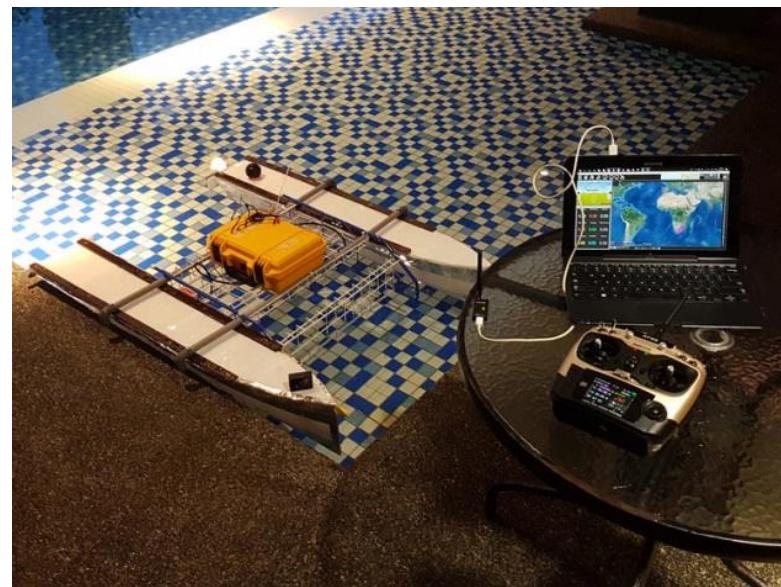


Side Scan Sonar device

Flying Drone 飛行無人機



Water drone and drop camera 水面及水下無人機和下垂相機



Water drone

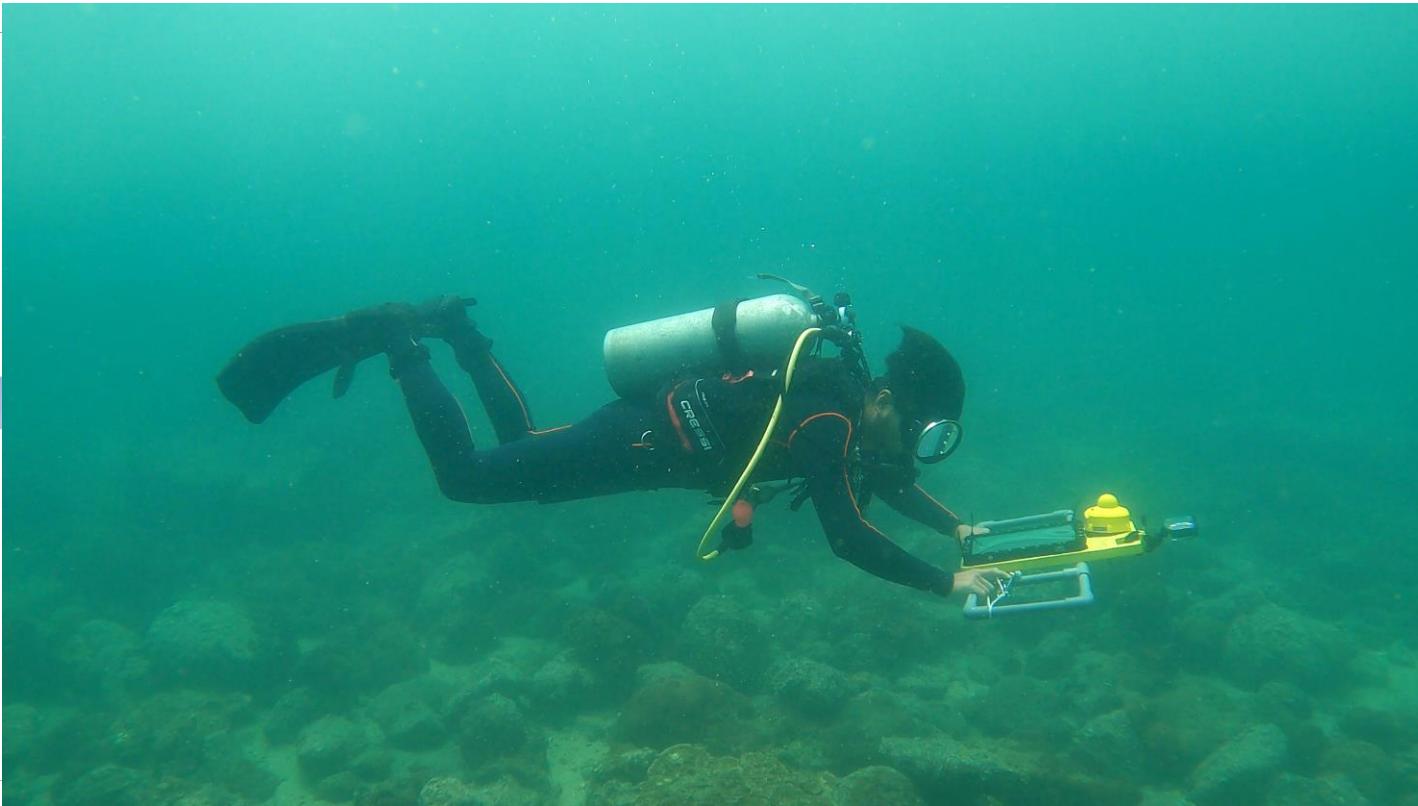
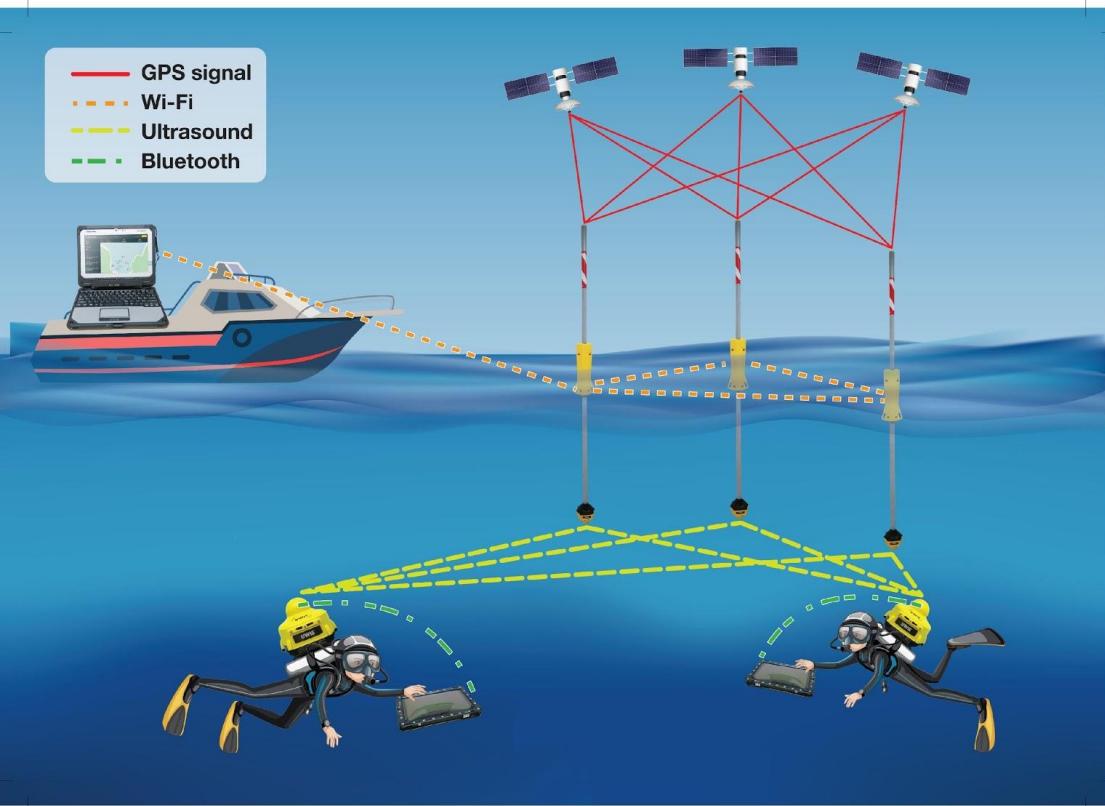


Face down drop camera



Surface console

Underwater Information System 水下資訊系統 (UWIS)



- **Underwater GPS 水下GPS**
- **Signal of ordinary GPS cannot penetrate water 普通GPS信號無法穿透水體**
- **UWIS combines GPS, Wi-Fi, Bluetooth and ultrasound technology 水下資訊系統 結合了GPS、Wi-Fi、藍牙和超聲波技術**



海洋污染國家重點實驗室
State Key Laboratory of
Marine Pollution



東平洲海岸公園底棲生境地圖繪製

Benthic Habitat Mapping of Tung Ping Chau Marine Park

Dr. Leo Lai Chan, Dr. Chi Chiu Cheang, Dr. Apple Pui Yi Chui

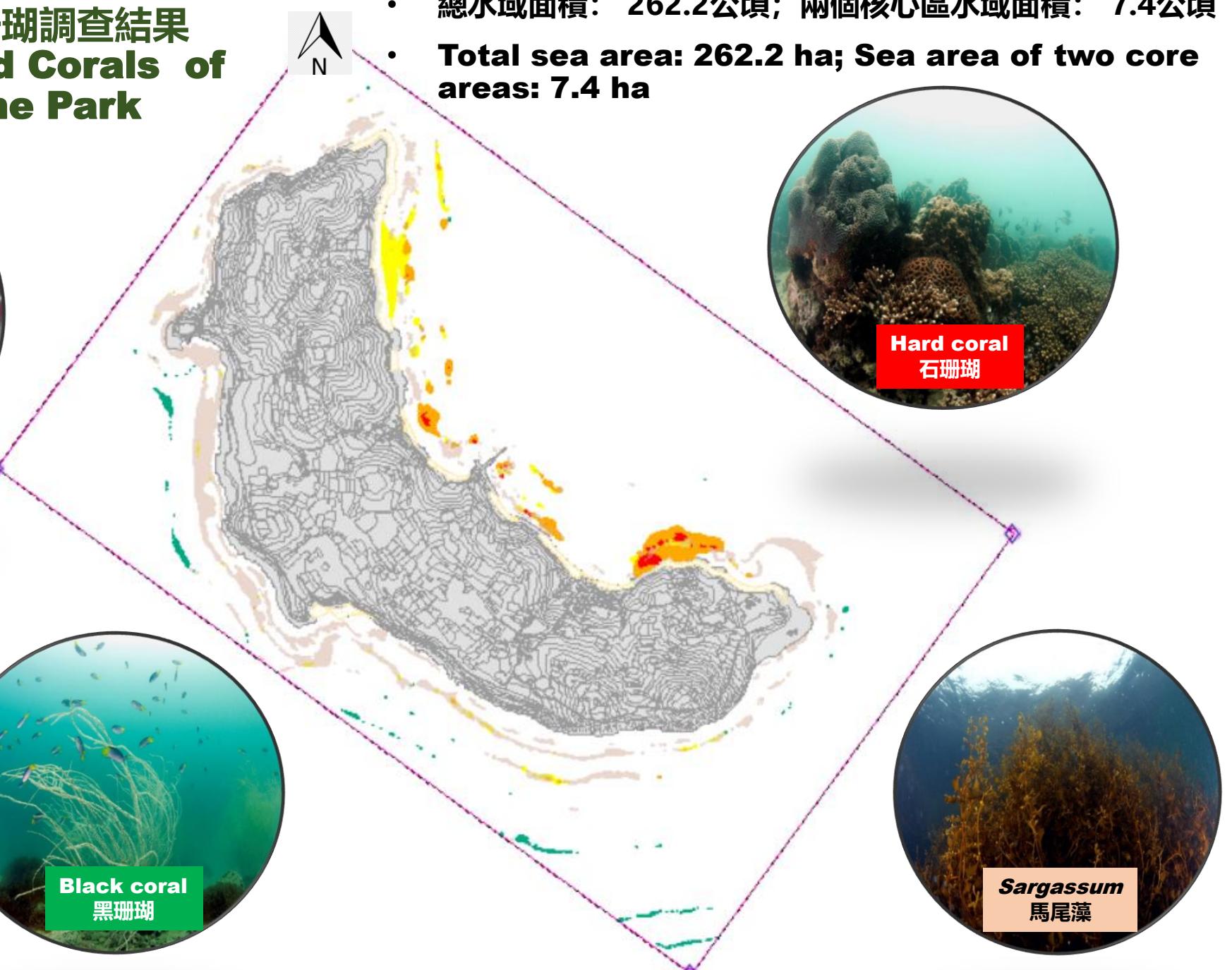
陳荔博士, 蔣志超博士, 崔佩怡博士

Field survey team: Steven Tsang, Nicci Ng, Jeffery Chung, Dr. Walter Dellisanti, Cher Chow and Sam Yiu

曾康泰, 吳珮珩, 鍾子浩, 戴伟德博士, 周馥溢, 姚景峰

東平洲海岸公園大型藻類及珊瑚調查結果 Result for Macroalgae and Corals of Tung Ping Chau Marine Park

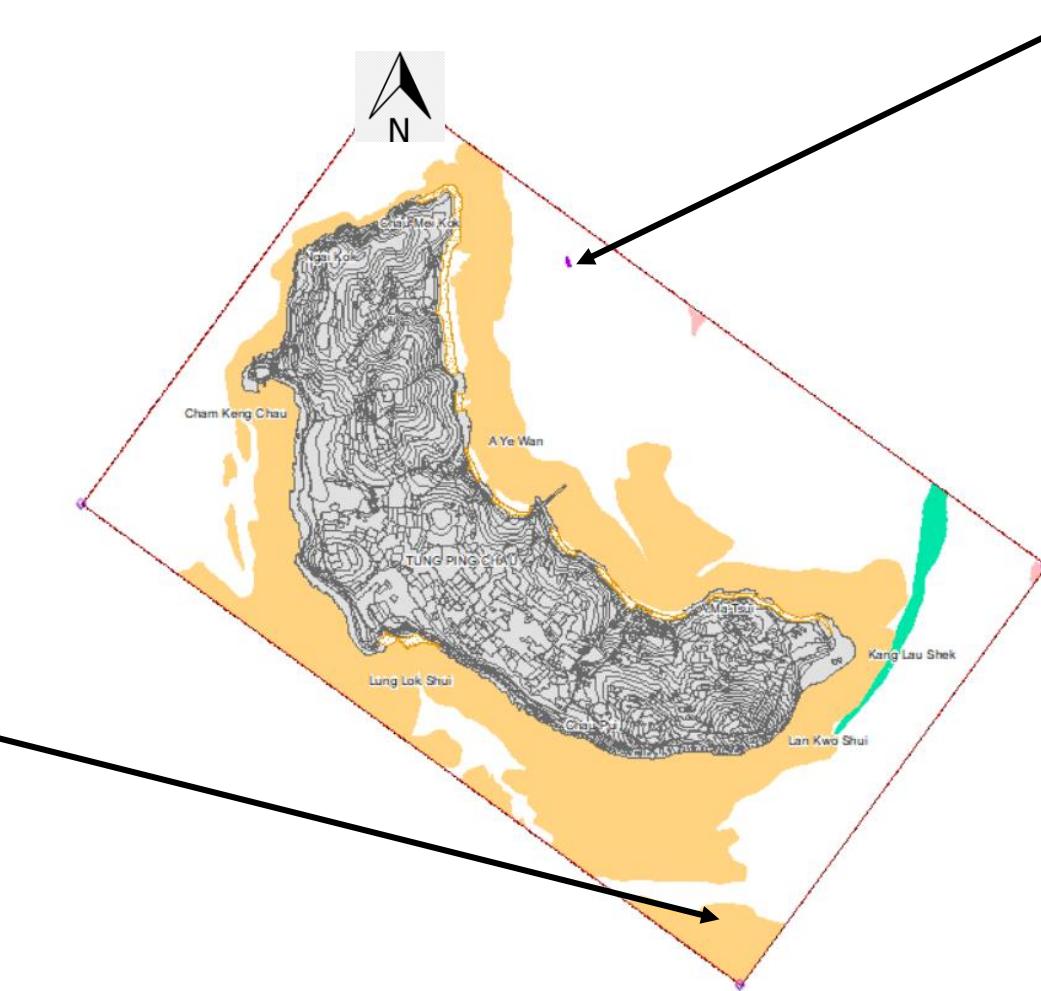
- 總水域面積: 262.2公頃; 兩個核心區水域面積: 7.4公頃
- Total sea area: 262.2 ha; Sea area of two core areas: 7.4 ha



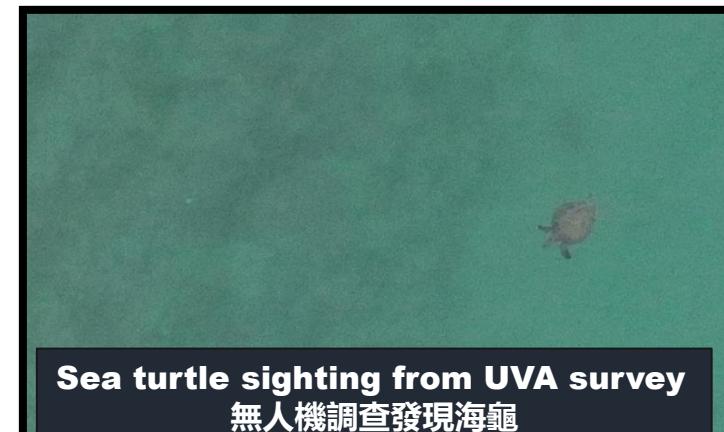
Legend

| |
|--|
| ◆ Buoy |
| ■ Sand |
| ■ Tung Ping Chau Marine Park (TPCMP) Boundary |
| ■ Project Boundary |
| ■ Macroalgae |
| ■ Octocoral and Black Coral |
| Tier 1 Hard Coral Distribution Coverage |
| ■ 50.1 - 100% |
| ■ 25.1 - 50% |
| ■ 10.1 - 25% |

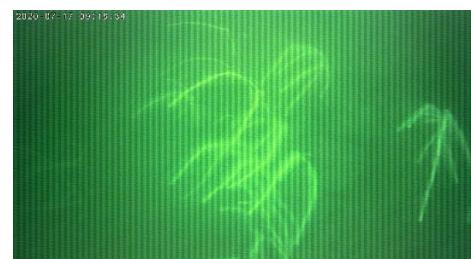
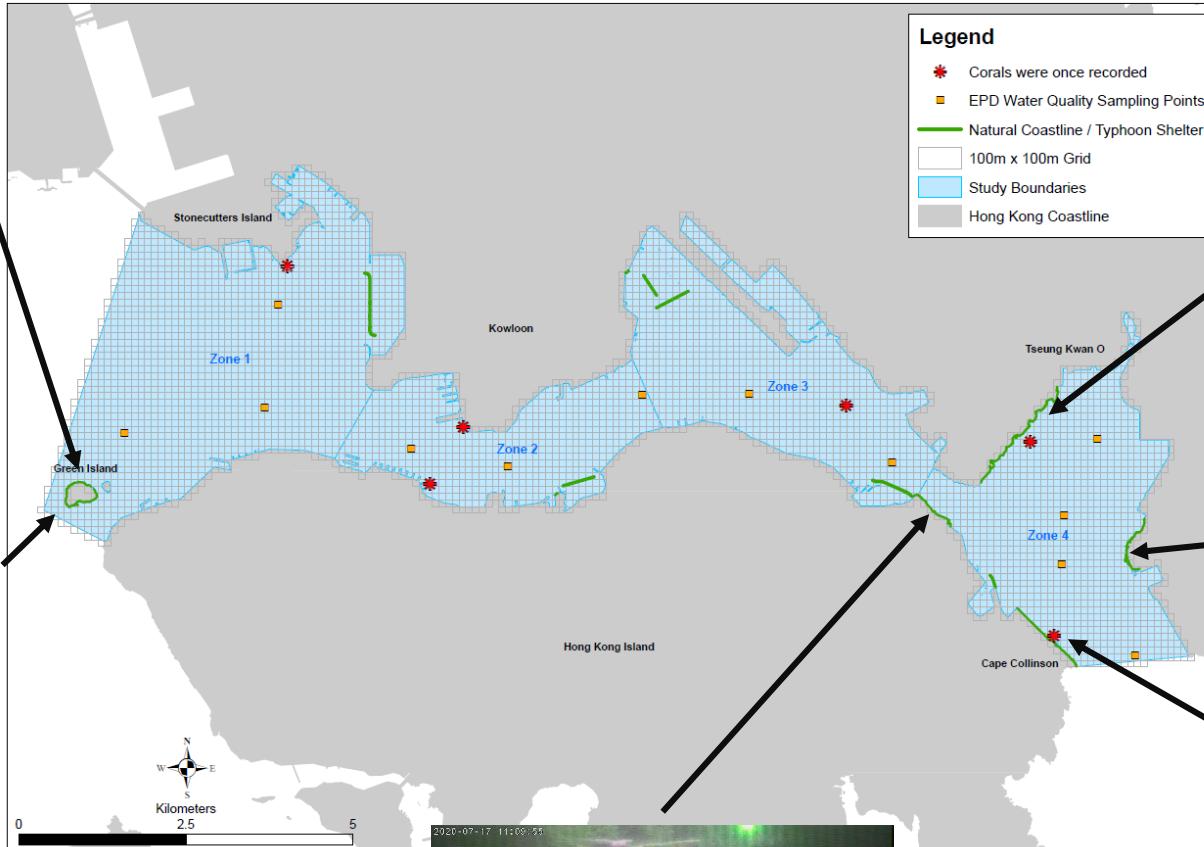
有趣發現 Interesting Findings



Newly discovered octocoral bed
新發現的軟珊瑚床



Preliminary finding in Victoria Harbour



亞太地區科學潛水培訓與認證管理



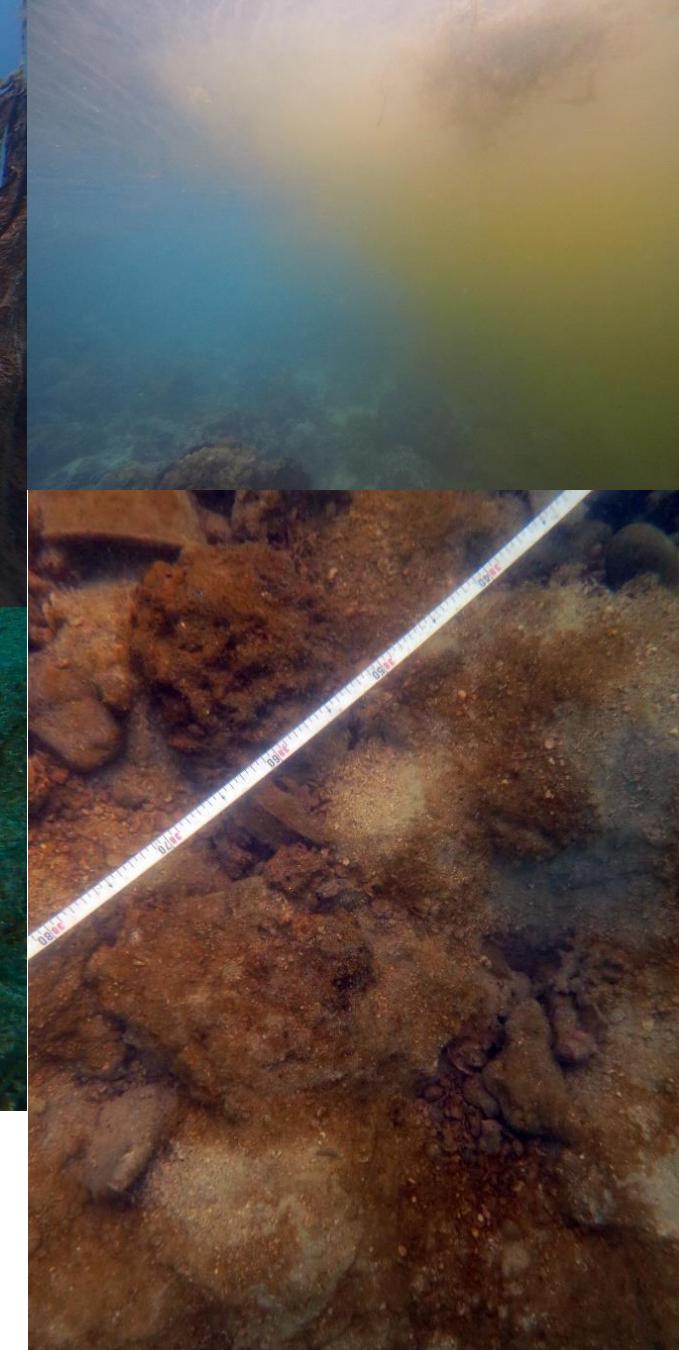
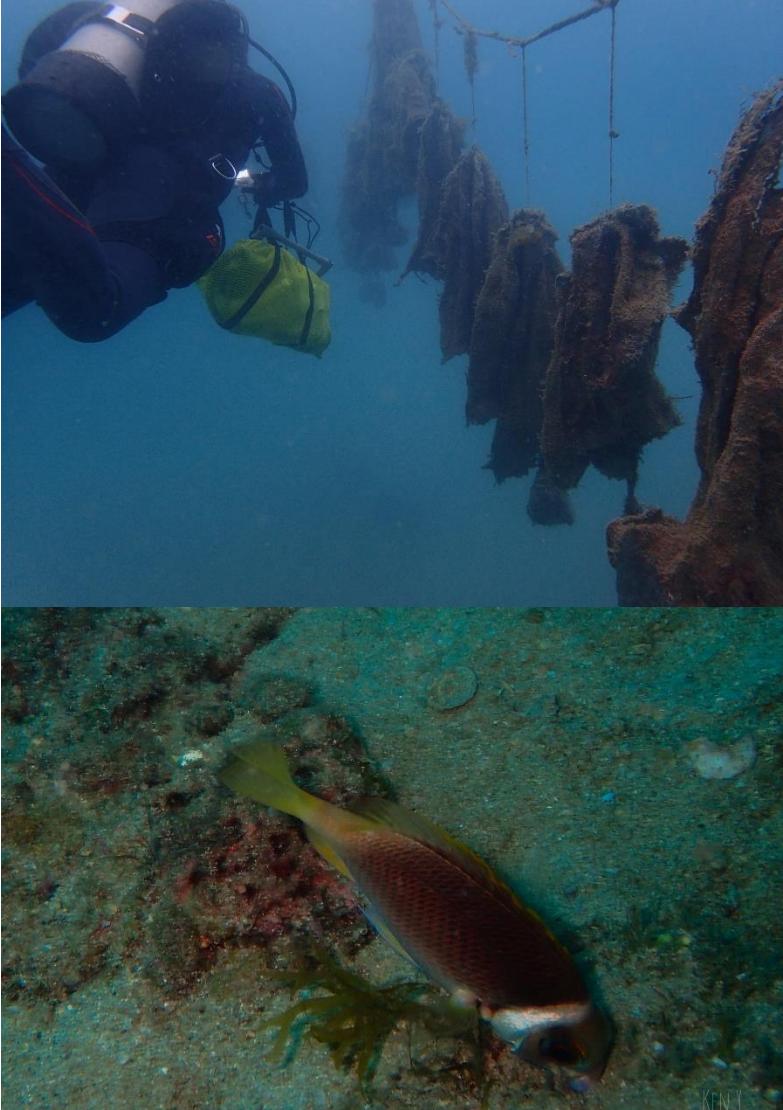
DIRECT OBSERVATION

直接觀察

You can also observe 也可以觀察：

- **Species interaction** 物種互動
- **HABs** 有害藻華
- **Special habitats** 特殊的棲息地

**Experience without learning
is better than learning
without experience** 沒有學問的
經驗勝過沒有經驗的學問

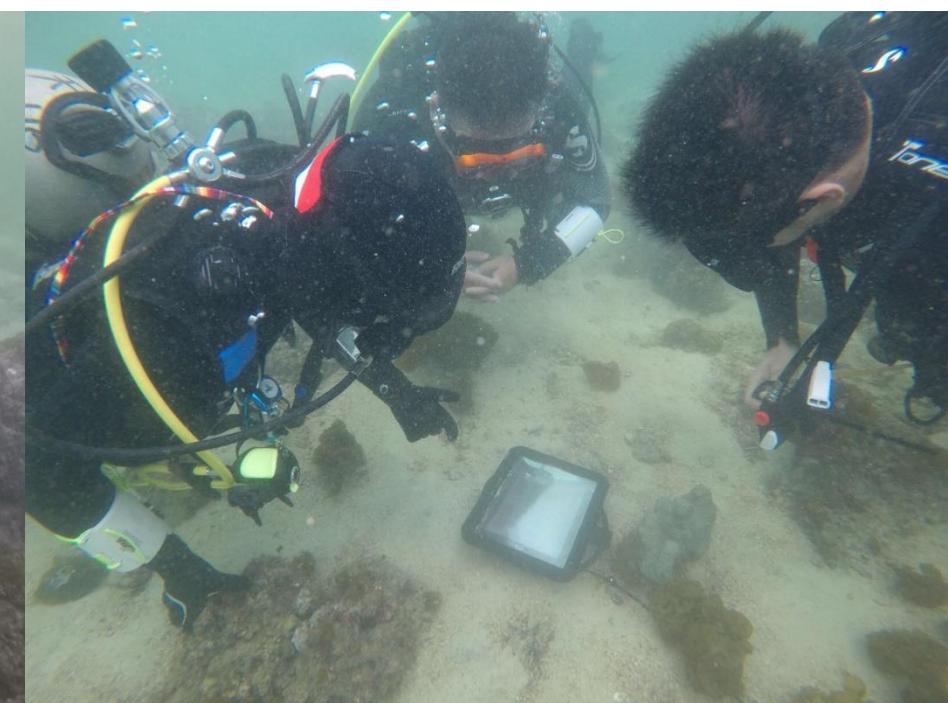
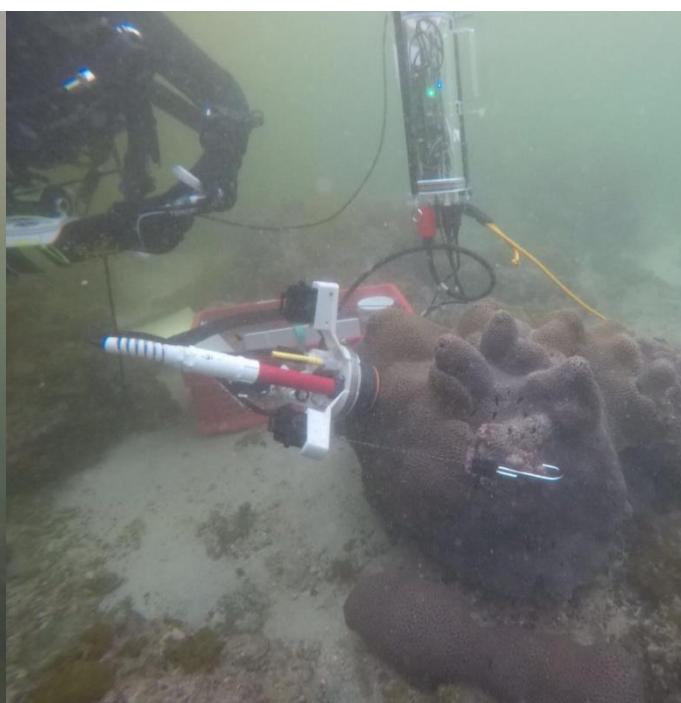


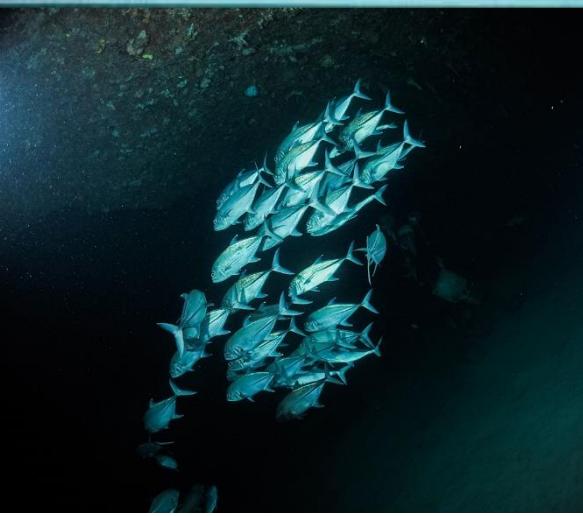
Study the nature but not the book

研究自然，而不是書



Strong microalgal bloom events were recorded caused by *Gonyaulax polygramma*, a non-potentially harmful species





潛水使學生和科學家們能直接觀察海洋生物及生態系統在自然界中真實的狀態：譬如海洋生物的生活形態、行為及其相互作用，從而瞭解實際環境中的生態過程。

Extreme Environments: THE CORAL TRIANGLE

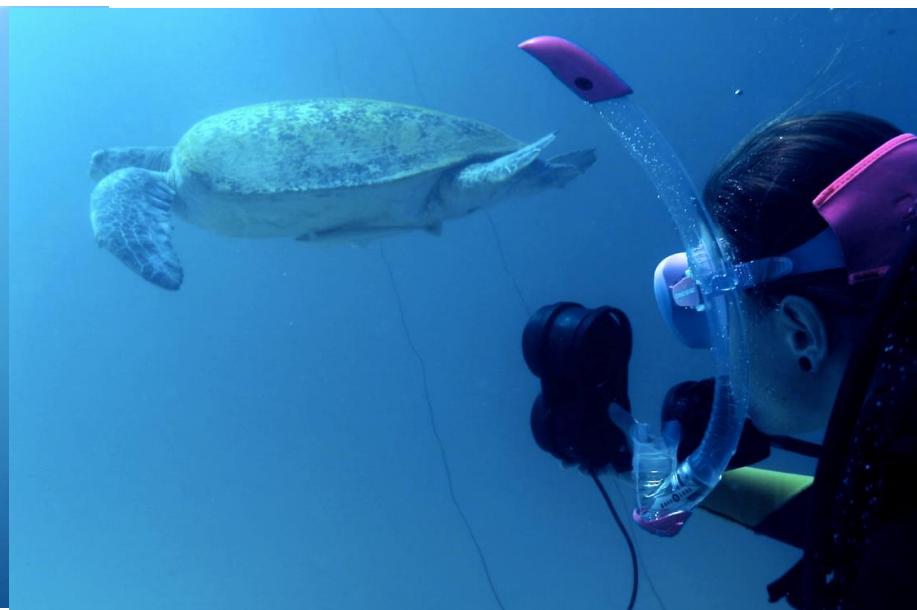
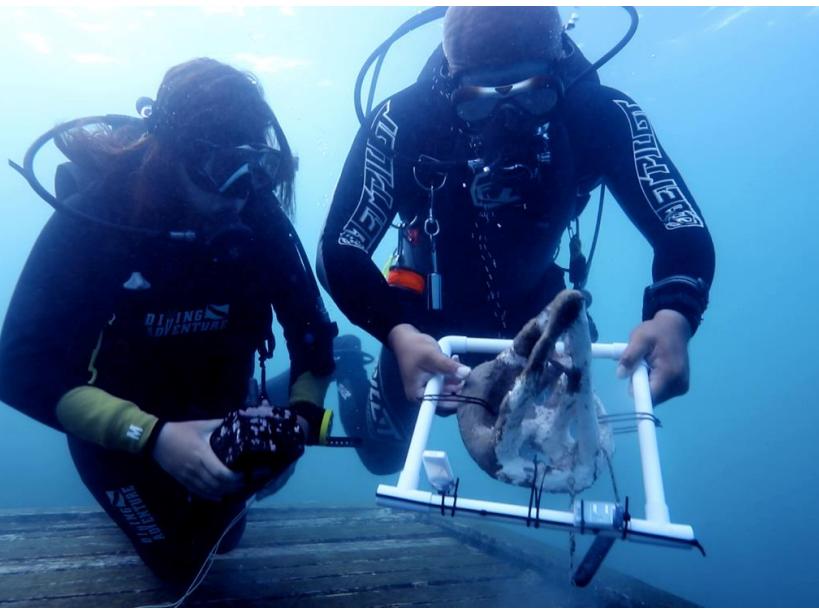
February - March 2017



CityU students' voyage of discovery to the Coral Triangle
城大學生探索珊瑚大三角的歷奇旅程



調查全球氣候變化下珊瑚生態系統的健康狀況以及底棲和附生有毒微藻（BETA）的分佈



利用開創性的高科技創意媒體藝術來呈現和闡釋環境、生態和社會學資料

你在岸上看大海，但你不知道海底在哭泣！
Seeing is believing 眼見為實

Just because you can't see it, doesn't mean it isn't there



Ocean Pollution: Plastic, Plastic Everywhere 海洋污染：塑料，塑料無處不在

2.5 BILLION

METRIC TONS OF SOLID
WASTE IS PRODUCED
ALL AROUND THE WORLD

AND WITHIN THAT
275M
METRIC TONS IS
PLASTIC WASTE

2 BILLION PEOPLE WITHIN
30 MILES OF THE COAST CREATE

100M

METRIC TONS
OF COASTAL
PLASTIC WASTE

WHAT WE
CAN DO

REDUCE
PLASTIC IN
WASTE STREAM

IMPROVE
SOLID WASTE
MANAGEMENT

INCREASE
CAPTURE &
REUSE

HEALTHY
OCEANS



AND EVERY YEAR,

8 MILLION
METRIC TONS
OF PLASTIC GOES
INTO THE OCEAN

JAMBECK ET AL., SCIENCE 2015

*PLASTICS EUROPE, "PLASTICS—THE FACTS 2013" (2010 DATA)

**COZAR ET AL., 2014; ERIKSEN ET AL., 2014



Ocean Pollution: Plastic, Plastic Everywhere

海洋污染：塑料，塑料無處不在



Stranded Whale with 'Mouth Full of Garbage'

Dies in Guangdong

擋淺的鯨魚嘴裡滿是垃圾，
死在廣東

By Matthew Bossons, March 16, 2017



Dead Whale in Guangdong Was Pregnant, Researchers Find 研究人員發現，位於廣東的死鯨在生前懷孕了

By Bailey Hu, March 17, 2017



Stranded Whale with 'Mouth Full of Garbage'

Dies in Guangdong

擋淺的鯨魚嘴裡滿是垃圾，
死在廣東

By Matthew Bossons, March 16, 2017



The fetus was well-developed; experts said that if the mother hadn't died prematurely, the baby might have been born in a few days. 胎兒發育良好；專家說，如果母親沒有過早死亡，寶寶可能會在幾天內出生。

Dead Whale in Guangdong Was Pregnant, Researchers Find 研究人員發現，位於廣東的死鯨在生前懷孕了

By Bailey Hu, March 17, 2017



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一條被發現已死亡的鯨魚，其胃部有超過30個塑料袋 - 專家說“並不感到意外”

A whale is found dead with more than 30 PLASTIC BAGS in its stomach – and experts say it's 'not surprising'

Site C

- The whale had been put down by wardens off the coast of western Norway
- Researchers dissected its stomach and found huge amounts of plastic
- The whale was also emaciated with little blubber suggesting it was malnourished



Do
iPhone



© University of Bergen



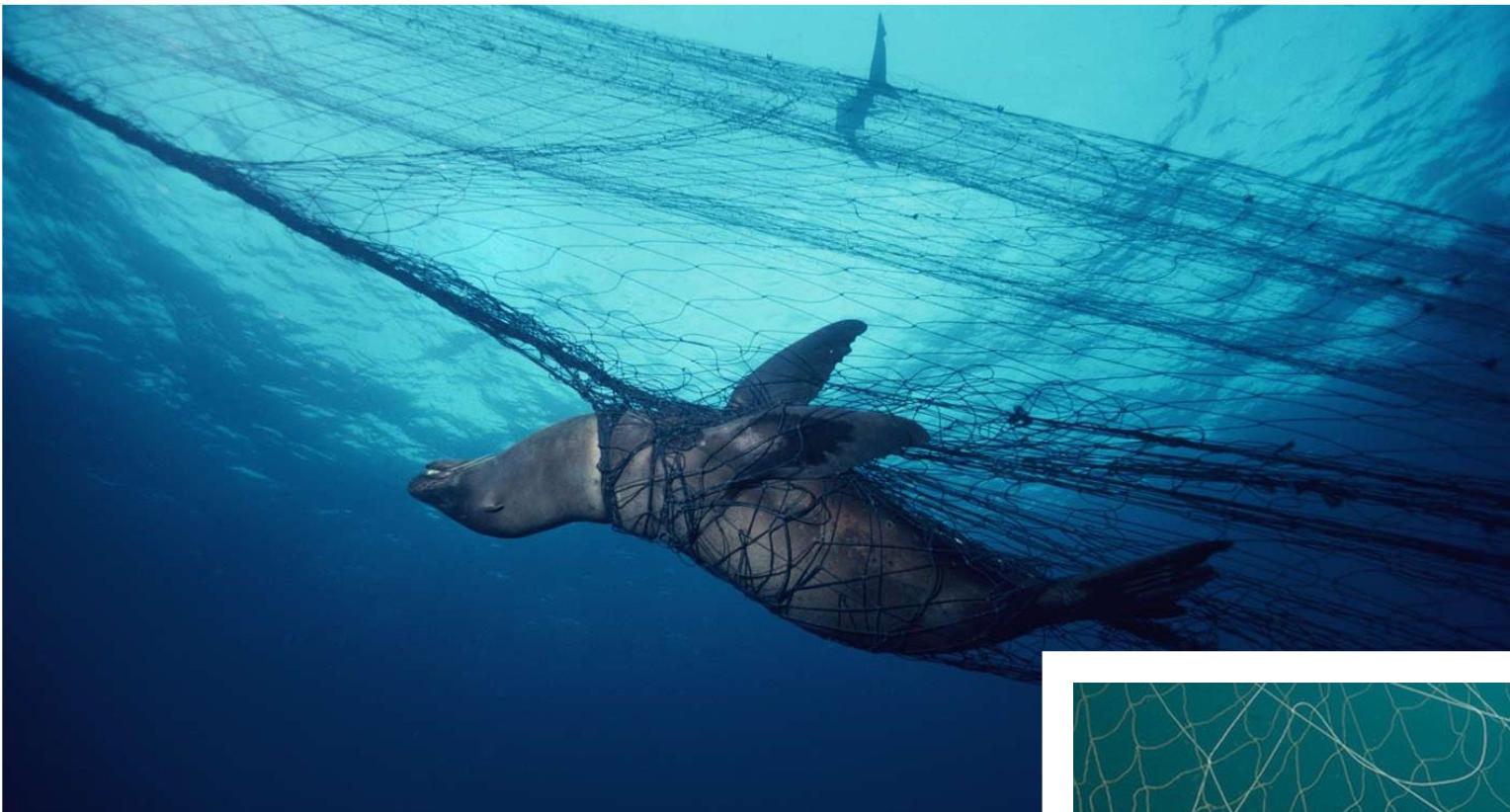
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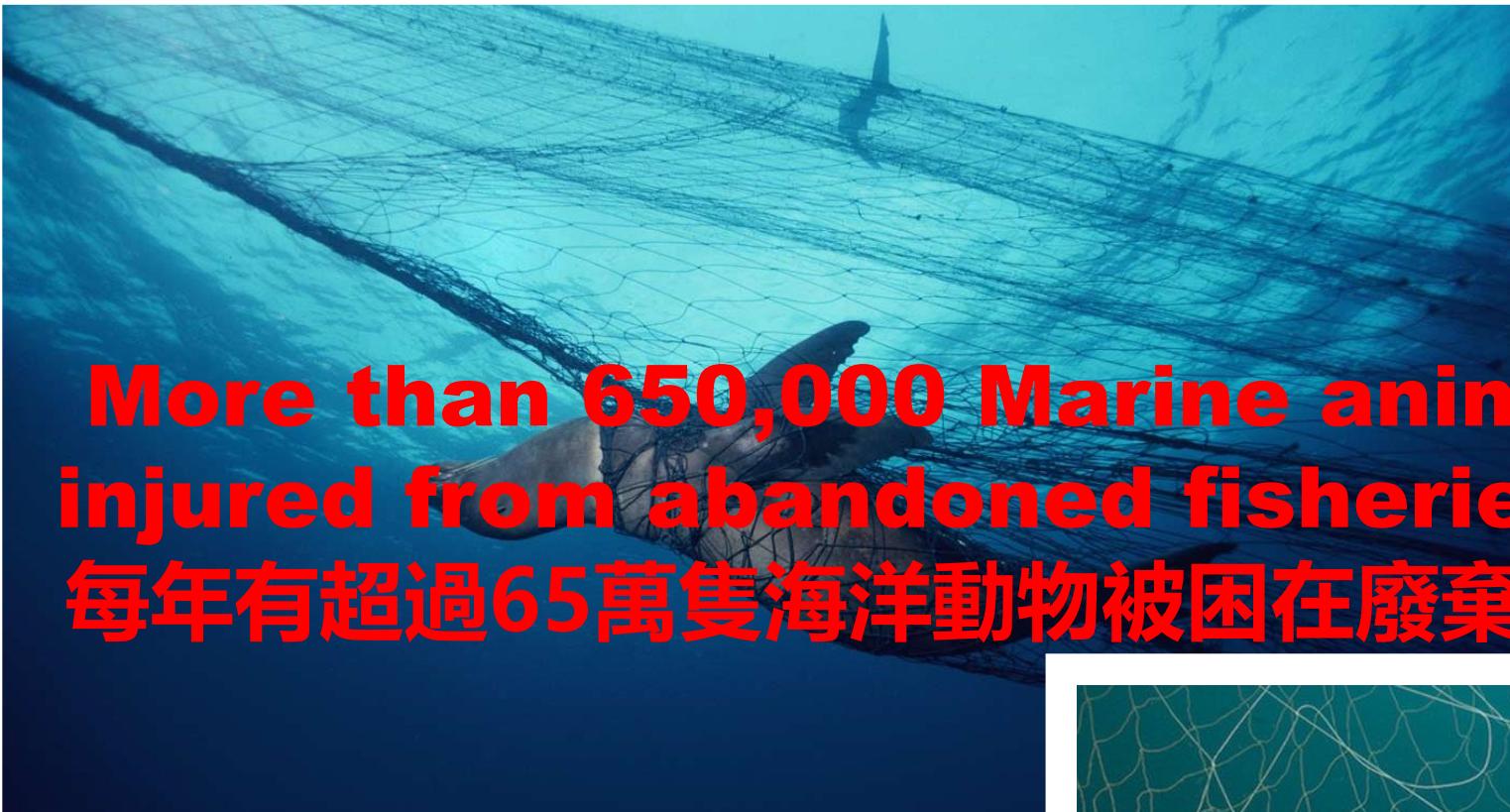
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More than 650,000 Marine animals are killed or injured from abandoned fisheries nets each year
每年有超過65萬隻海洋動物被困在廢棄的漁網中喪生或受傷





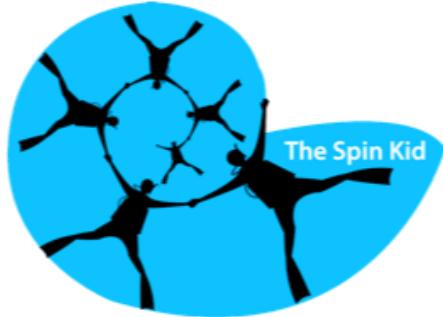
More than 650,000 Marine animals are killed or injured from abandoned fisheries nets each year
每年有超過65萬隻海洋動物被困在廢棄的漁網中喪生或受傷



More than 600,000 tonnes of fishing gear are lost each year
每年丢失的漁具超過60萬噸



“The Spin Kid” and “Ocean Citizenship” projects 哪吒計畫 及 浩海公民 計畫 (2011-2021)



**To ignite passion for the protection of the marine environment;
and the pursuit of interest in the importance of marine science**

傳播保護海洋環境資源火種；點燃下一代追求海洋科學的興趣

**To nurture general public as “Citizen Marine Scientists” for the
protection of marine environment**

培養「市民海洋科學家」；普及海洋生態保育

**There are 200
participants, with 60 and
30 trained as certified
Open Water Divers and
Advanced Open Water
Divers, respectively.**

兩個
計畫共計成功培養開放水域潛水員60名，開放水域進階潛水員30名，參與活動人數累積超過200人次。





Mr. Lawrence CHAN
陳朗先生

- **BSc in Bioveterinary Sciences, The Royal Veterinary College of University of London**
- 倫敦大學皇家獸醫學院生物獸醫學學士



President and Founder of Sea Dweller Underwater Academy
潛者水下學院總裁兼創始人

Dr. Lilian CHAN 陳昕醫生

- **Bachelor of Medicine and Bachelor of Surgery, Faculty of Medicine of The Chinese University of Hong Kong**
- 香港中文大學醫學院醫學士及外科學士
- **Medical Health Officer of Princess Margaret Hospital**
- 瑪嘉烈醫院醫療衛生主任



Scuba Diving Instructor 水肺潛水教練



游泳、潛水、對於肢體及智力健全的人士而言，可能稍為學習一下就能做到。然而，享受水上運動的機會並非健全人士的專利！原來，經過努力、通過訓練、健體人士也可在水中游出水面。國際傷殘潛水協會（香港）成立已達六年，由最初為了讓傷健人士初嘗潛水之樂，時至今日，失明、失聽、智障人士都在協會會籍之列。

每個星期的星期日，協會都會在西島中學的上課廳舉行三小時的訓練活動：游泳或浮潛課程，太極拳或在岸上做暖身運動。副領隊會帶領的單人洗衣、整理行李和洗廁所衛生間。——參加訓練後便換上乾淨衣裳，在游泳池裡游個幾圈——是參加訓練後最重大的改變。在訓練前我們常常用手擦，在訓練後用清水（Dish Master）噴頭下，參加者便放下水，感受水中的無重量。雖然他們在中場報到，但這種猶如重生的感覺，是他們在中場報到時，並非領隊們能夠傳達給他們的。

為了確應用性和挑戰性，協會堅持在水底設置攀爬架能的情境，讓學員是學會擺在水中揮全身的技巧，逐步培養出水員的專業。

時至今日，協會已經將版權下放到社羣人士。身為教師，每次接觸不同的學員，Aui都希望得到一次學習的機會。「以工作為主，我只會當一個健全的棋盤，但爲了與這裏的棋子溝通，我學會了手語，亦同時更懂得站在他人的角度思考。例如拍掌，」

四肢癱瘓不認命 繼續追尋海洋夢 珊瑚礁普查體現傷健共融

瑚是不少生物賴以為生的家園，但生長緩慢，受損後要很多年才能康復，有些更可能永不復元。因此，漁護署每年都會進行珊瑚礁普查，了解珊瑚礁生長情況；共有60多支潛水隊伍參加，在33個地點考察珊瑚種類和生長情況，推動海洋保育。其中，圓融衛健潛水社會已連續三年派員參與，包括多位殘疾人士，體現助弱扶弱共融。主席葉健強表示，海洋使他重拾自信，在同一海底，同齊心合作，看到的世界同樣美麗。

香港關部報章



■葉健強多年前因意外引致四肢癱瘓，在義工協助下，同樣能享受潛水樂趣。

“Embrace Challenge Together” - by working hand-in-hand to demonstrate and reach out to others to promote the benefit and enjoyment of being underwater

對培訓不同類別的殘障人士具備豐富的心得和經驗，透過“共勉，迎挑戰”，一同攜手實踐傷健共融的理念，及推廣潛水給與殘障人士的益處及樂趣。



Digitized by srujanika@gmail.com



隊的表現有時還比普通團隊好。他們溝通和合作能力很強，在水裏的浮控能力也較好，可避免破壞珊瑚。」

義務潛水63隊逾600人

在每年一度的珊瑚礁普查，潛水員在海床指點範圍內記錄珊瑚、魚類和無脊椎生物的資料和數據，之後交由護謹會分析整合。丘志財覺得活動很有意義，認為參與珊瑚礁普查屬於潛水人士的公民責任，而他更享受過程中的無盡驚喜。「在海底世界，你可能遇上一大群一大群的魚，那情景震憾極了。幾萬條魚團團圍繞，而你就在其中。」

漁護署高級海洋護理主任周永權指出，珊瑚礁普查講求團隊合作，確能體現復健共融的精神。「我們觀察到，復健團

A photograph of two scuba divers in an underwater coral reef environment. One diver is in the foreground, facing away from the camera, while the other is in the background, facing towards the camera. They are both wearing scuba gear, including wetsuits, fins, and oxygen tanks. The water is clear, and the coral reef is visible in the background.

Ocean Citizenship: 浩海公民
Creating a new generation of professional divers from
institutional to citizen-science
為學術機構及大眾市民訓練新一代專業科學潛水員



Being Ocean Guardians, we're committed to the international solidarity built around the sustainable management of the ocean. 作為海洋守護者，我們致力於可持續海洋管理建立的國際團結。

We pledge to adopt sustainable habits – to say NO to single-use plastics and shark fins– to preserve the health of the ocean so that future generations will continue to benefit from the resources it provides. 我們承諾採用可持續的習慣 - 對一次性塑膠和鯊魚鰭說“不” - 保護海洋的健康，以便後代將繼續從其提供的資源中獲益。

**We're committed to love and protect the ocean.
我們致力於熱愛和保護海洋。**

**ONE WORLD, ONE OCEAN and ONE HEALTH
同一個世界，同一個海洋和同一個健康**



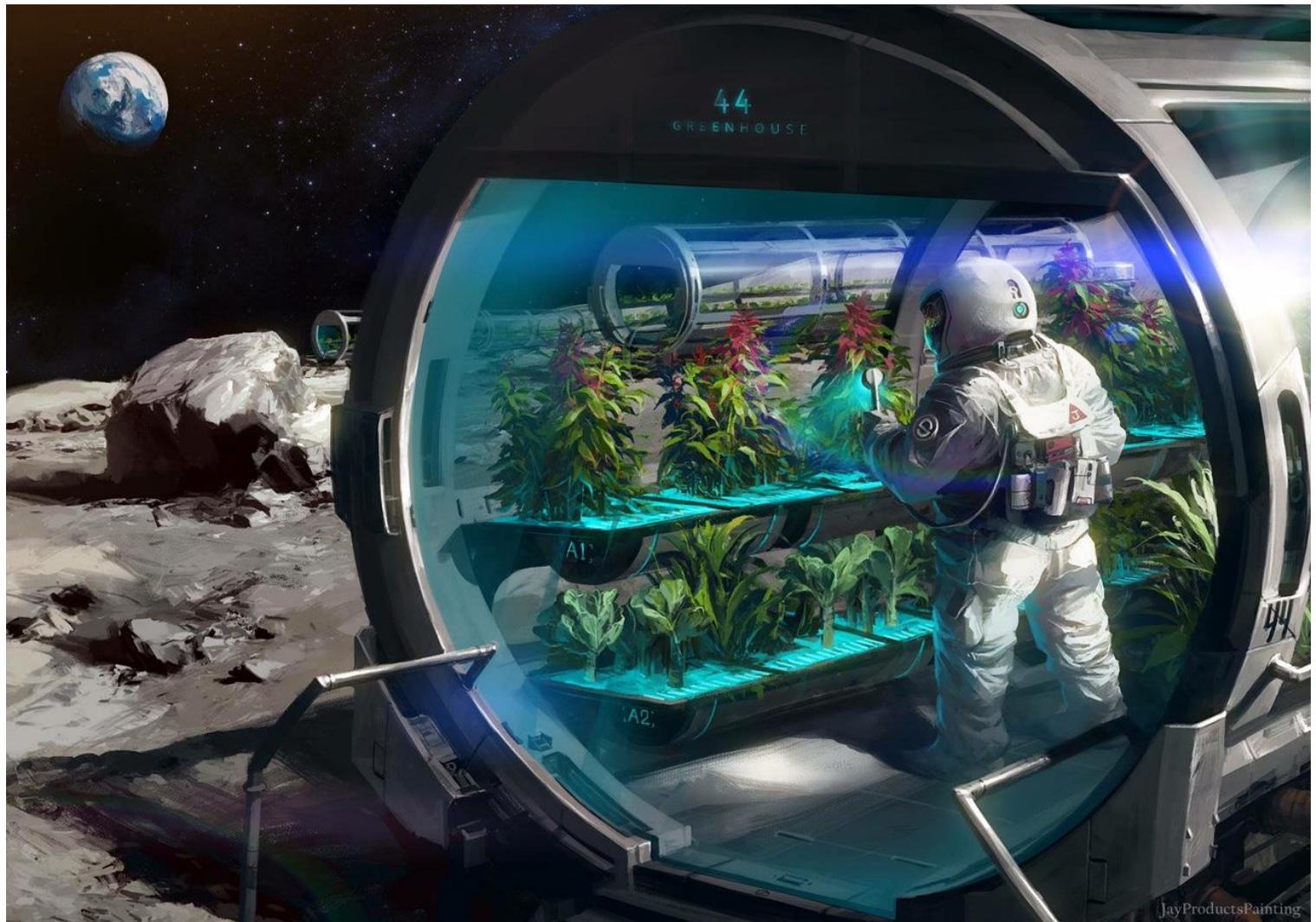
Mission To Mars

**Some people look for a
better planet!**

有些人在尋找更好的星球！

**We make our place
beautiful, safer and
healthier**

**而我們卻努力將我們的家園
變得更美麗、安全與健康.**



Hong Kong Reef Check 香港珊瑚礁普查

Hong Kong Reef Check is a part of global programme to promote sustainable management of coral reefs

香港珊瑚礁普查是全球計畫的一部分，促進珊瑚礁的可持續管理



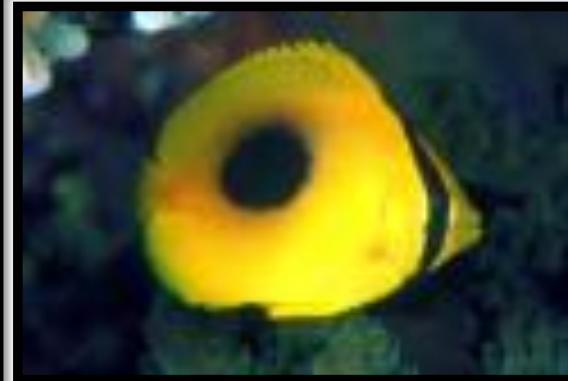
Monitoring of Coral Communities in Hong Kong



Setting survey transect



Reef Check



Fish

Invertebrates

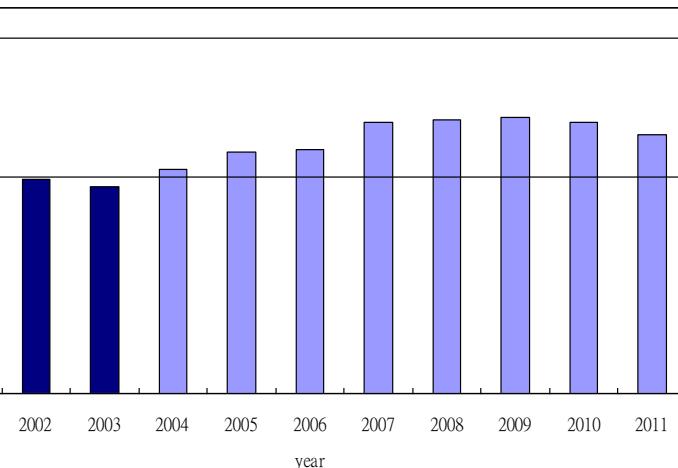
Scientific data

Reliable scientific data is obtained for future conservation and management



Coral

| Site | Indicator Species (Observation) | | | | | | | | | |
|--------------------------|---------------------------------|----------------------------|-----------------------------|--------------------|----------------------------|---------------------------------|--------|------------|--------|--|
| | Sea Urchin Dermatophagoides | Sea Urchin Other Urchin | Starfish Common Starfish | Starfish Edible | Starfish Other Starfish | Starfish Banded Coral Shrimp | Cowrie | Nudibranch | Others | |
| Coral Beach | 238 | — | 31 | 1 | — | — | — | — | — | |
| Wong Chuk Kok Hui | 299 | 81 | — | — | — | — | — | — | — | |
| As Is West | 2 | 4 | 21 | — | — | — | — | — | — | |
| Shore Island Kook | — | — | — | — | — | — | — | — | — | |
| Lai Chi Wo | 111 | 70 | 41 | 7 | 2 | — | 14 | — | — | |
| Coconut Island South | — | — | — | — | — | — | 15 | — | — | |
| Shore Island | 52 | 52 | 37 | — | — | — | — | — | — | |
| Town Island | 137 | 9 | 14 | — | — | — | — | — | — | |
| Pui Oi Hoi Wan | 14 | 16 | 44 | 3 | — | — | 17 | 1 | — | |
| Li Ya Wan | 10 | 6 | 2 | — | — | — | — | — | — | |
| Tau Shek Wan | 2 | 6 | 3 | 3 | — | — | — | — | — | |
| Tin Hau Kei O | 240 | 110 | 121 | — | — | — | — | — | — | |
| Gor Head | 996 | 105 | — | — | — | — | 6 | — | — | |
| Blue Island | 12 | 14 | 10 | — | — | — | 9 | — | — | |
| Lantau Kei Wan | 37 | 43 | 5 | 2 | — | — | — | — | — | |
| Ngong Ping Wa Wan | — | — | — | — | — | — | — | — | — | |
| Port Island | — | — | — | — | — | — | — | — | — | |
| Aka Yee Wan | 73 | 5 | 55 | — | — | — | 5 | 1 | — | |
| Kai Chung Wan, Kit O | — | — | — | — | — | — | — | — | — | |
| Shore Island North | 2 | — | 8 | — | — | — | 3 | — | — | |
| Town Island | — | — | — | — | — | — | — | — | — | |
| Wu Pui, Crescent Island | 150 | 50 | 5 | 2 | — | — | 1 | — | — | |
| Shore Island | — | — | — | — | — | — | — | — | — | |
| Shore Island South | — | 68 | 30 | — | — | — | 1 | — | — | |
| Pak A | 8 | 12 | 3 | — | — | — | 4 | — | — | |
| South Nengpo | 215 | 20 | — | — | — | — | — | — | — | |
| Shore Island | 476 | 48 | 131 | — | — | — | 3 | — | — | |
| Pak Lai Wan | 24 | 12 | — | — | — | — | 3 | — | — | |
| Sea Long Ke | — | — | — | — | — | — | — | — | — | |
| Crescent Island West | 4 | 50 | 3 | — | — | — | — | — | — | |
| Tin Hau | — | — | — | — | — | — | — | — | — | |
| Shore Island East | 10 | 31 | 7 | — | — | — | 8 | — | — | |
| East Dam | 35 | 51 | 30 | — | — | — | 1 | — | — | |
| Kai Sui Chan East | — | — | 29 | — | — | — | — | — | — | |
| Tin Hau | 41 | 65 | 23 | — | — | — | 6 | — | — | |
| Kai Sui Chan, Kap Lo Kok | 145 | 80 | 11 | — | — | — | — | — | — | |
| Kai Sui Chan West | 50 | 43 | 2 | — | — | — | 2 | — | — | |
| Tin Hau, Pak Ma | 3 | 20 | 15 | — | — | — | — | — | — | |
| Total | — | — | — | 29 | 28 | 7 | 4 | 1 | 21 | |

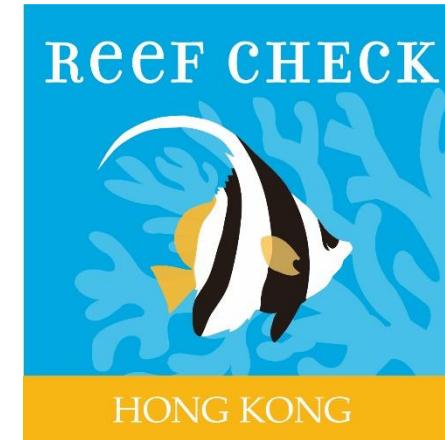


Hong Kong Reef Check, AFCD

香港珊瑚普查, 漁農自然護理署

HKRC 2019 Summary 香港珊瑚普查2019總結

- **Total of 88 teams, involving over 900 volunteer divers;**
共有88個潛水隊，涉及900多名志願潛水員；
- **33 sites were surveyed in 4 months;**
在4個月內完成了33個網站；
- **Coral coverage ranged from 10.0%-82.5% among the 33 study sites;**
在33個調查點中錄到了從10.0%到82.5%的珊瑚覆蓋；
- **Sharp Island North was the site with the highest coral coverage (82.5%),**
在橋咀洲北錄得最高的珊瑚覆蓋範圍(82.5%)；
- **15 out of the 33 study sites had high coral cover (over 50%);**
在33個普查地點中，有15個錄得相當高的珊瑚覆蓋範圍(超過50%)；
- **5 out of 9 survey sites within Marine Parks (i.e. Hoi Ha Wan, Yan Chau Tong and Tung Ping Chau Marine Parks) recorded high coral coverage (i.e. >50%);**
海岸公園內的9個調查地點中有5個（海下灣，印洲塘及東平洲海岸公園）錄得高珊瑚覆蓋率（即> 50%）；
- **No destructive fishing practices, but ghost nets were found in 10 sites**
所有普查地點均沒有破壞性捕魚作業的痕跡，但有10個地點錄得有棄置漁網的情況
- **Minor localized bleaching in 2 study sites**
2個地點錄得局部珊瑚白化的現象
- **Public Results 公開結果**
- **Scientific Database 科學資料庫**
- **Educational and publicity activities 教育和宣傳活動**



漁農自然護理署

Agriculture, Fisheries and
Conservation Department



iPhone



Android



珊瑚白化報告 Coral Bleaching Reporting



- **A new reporting system setup by AFCD**
- 漁護署建立了新的珊瑚白化報告系統
- **Follow up and monitor the bleached coral colonies**
- 跟進及監察發現白化的珊瑚個體
- **Accessible through Reef Check App or QR code**
- 可以透過珊瑚普查軟體或掃描QR碼進入



<https://www.jotform.com/form/200558542131447>

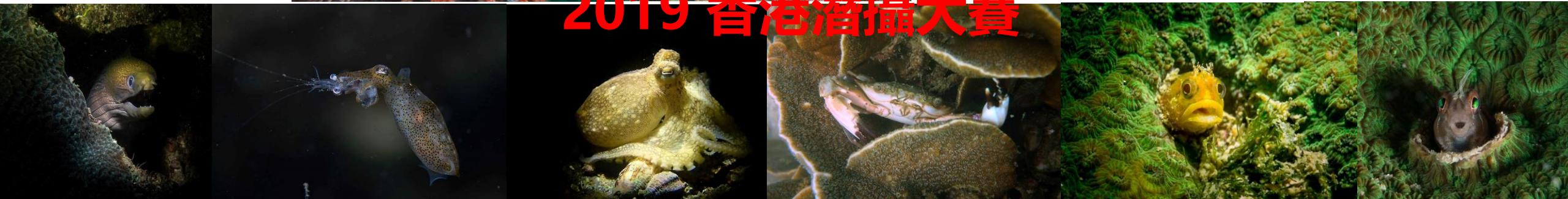
漁農自然護理署
Agriculture, Fisheries and
Conservation Department





Hong Kong Underwater Photo & Video Competition 2020

2019 香港潛攝大賽







Hong Kong Underwater Photo & Video Competition 2020

2020 香港潛攝大賽





Enhance community awareness, knowledge and promote long-term engagement of the public in coral conservation and restoration through workshops, public seminars and citizen science programmes

Supported by: AFCD, WWFHK, Ocean Park Hong Kong and PEW Fellowship in Marine Conservation

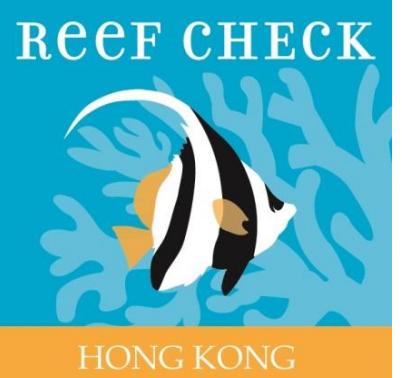


<http://coralacademy.hk>



PEW Marine Fellow 2019 and GGEF Women Eco Game Changer Awards 2019 - Eco star of China





Coral Restoration Workshop

Mr. Keith KEI



Hong Kong Baptist University



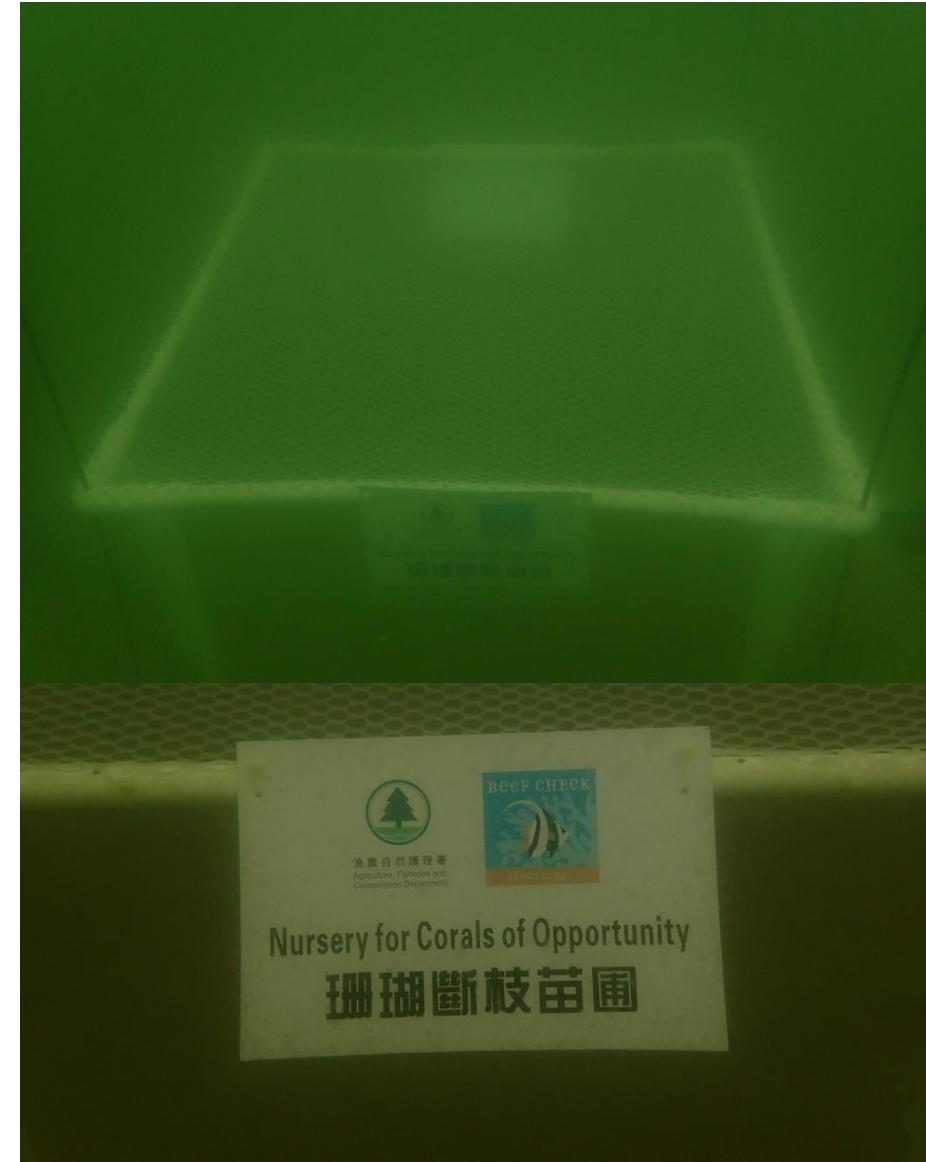
Underwater Epoxy



**Broken fragments (Corals of Opportunity)
will die if they were covered by Sand**

**Saving fragments by
fixing them on the rocks**

Nursery for Corals of Opportunity





漁農自然護理署
Agriculture, Fisheries and
Conservation Department



Workshop on Abandoned Fisheries Nets and Diving Safety

廢棄漁網和潛水安全研討會





- **Understanding how abandoned fisheries nets affect marine life and the oceans and how to conduct underwater clean-up safely**
- 瞭解**廢棄漁網**如何影響海洋生物和海洋以及如何安全地進行**水下清理**





香港城市大學
City University of Hong Kong

專業 創新 胸懷全球
Professional · Creative
For The World



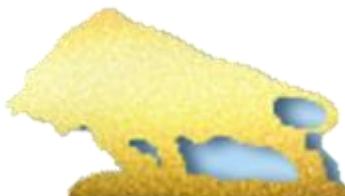
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True success is not in the learning but in its applications to benefit mankind and nature!
真正的成功不在於學習本身，而在於如何去應用造福人類及自然！



Thank you for your attention!

