



>> Text—江婉如 (Wan-ru Jiang) Photographer—陳佩綺 (Pei-Chi Chen)
Resource—中華民國溪流環境協會理事長 張崑雄 (Kun-hsiung Chang, chairman of Society of Streams, R.O.C.)
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Brilliant
People
精采
人物



細說福爾摩沙的海洋奧妙

國寶級海洋專家——張崑雄

Plumbing the depths with marine biologist Kun-hsiung Chang



墾丁海景
Seascape of Kenting

時而澎湃洶湧、時而恬靜輕柔，站在臨海的高雄港灣，每一刻都能感受來自海洋的諸多風情。在高雄長大的張崑雄，傾盡情感、細數海洋的美，在他眼中，四面環海的台灣，隨手拈來，每一隅都有動人的故事。

It swells, it subsides, it sweeps gently along the shore. Standing on the breakwater at Kaohsiung Harbour, one can see so many different faces of the sea from moment to moment. Growing up in Kaohsiung, Kun-hsiung Chang is passionate about the sea. In his eyes, life on the island of Taiwan has an endless ocean of stories to share in all its different corners.



位於太魯閣的清水斷崖緊鄰太平洋
Cingshui Cliff of Taroko overlooks the Pacific Ocean

張崑雄，對海洋文化稍有涉獵的人，應該都對他不陌生。被稱為老師的老師，現為中華民國溪流環境協會理事長，同時也是台灣海洋大學、中山大學等多所學校的教授，更是內政部國家公園計畫委員會委員、國家公園學會顧問等。

很難一一細數張崑雄的學經歷，因若真要詳列，恐怕需要更多的篇幅。畢竟，每一項傲人的資歷，都是他在這數十年內，為台灣海洋保育竭盡心力、無悔付出的表徵。

Kun-hsiung Chang, whom people often respectfully refer to as a teacher among teachers, has an enviable reputation in the field of marine studies. He is the Chairman of the Society of Streams (R.O.C.), professor at both National Taiwan Ocean University and National Sun Yat-Sen University, member of the National Park Planning Commission under the Ministry of Interior, and consultant for the National Park Association in Taiwan.

It's hard to list all his professional experience, as he has spent decades working in the field, dedicating himself to marine ecology conservation issues. His efforts and accomplishments have made significant contributions for Taiwan.



親海、愛海、研究海

從小就住在高雄西子灣旁的張崑雄，海洋就像是他的活動操場。「我自己都不知道我是幾歲學會游泳的」，張崑雄笑著說，和同伴悠游於蔚藍的大海，是與生俱來的天賦，自然暢快的程度，絕非長期生活在陸地上的我們可以想像。也因為張崑雄的親海、愛海，才讓他發現台灣蘊藏著珍貴的海洋資源，更讓他以此為志，在求學路上，一頭鑽進浩瀚無垠的海洋領域。

「台灣是海島，有獨特海洋資源，豐富的程度值得研究資源利用」。張崑雄早在學生時期，就認為台灣應以海洋資源為發展主軸，因此從台大動物系畢業後，便決心到日本潛心研究海洋生物資源。

45年前的張崑雄，就懂得用宏觀的思維看台灣，大膽一反到美國留學的潮流，選擇到同是島國的日本學習海洋科學教育。「捨棄和同學一樣都報考醫學、電機等較有『錢』途的科系，一點也不遺憾，家人也很支持」，懂得以寬廣的心胸看大環境，張崑雄盼從學術研究為出發點，為台灣海域盡一份力。

A Vast Love for the Ocean

Kun-hsiung Chang has lived in Xizi Bay in Kaohsiung since he was a child, and so the sea to him is his playground. "I don't really remember at what age I learned how to swim," he confesses. To him, swimming is as natural a skill as walking, and it might be hard for others to imagine the intensity of the joy which comes to him through his relationship with the ocean. It is this deep love of the ocean which led him to explore the richness of Taiwan's marine resources and eventually develop an academic career in the field of marine studies.

"As an island, we have unique and rich marine resources, and they deserve proper study so we can make best use of them," Kun-hsiung Chang teaches. In his early days, he already had the insight that Taiwan should make marine resources a central component of national development. With these thoughts in mind, he graduated from the zoology department of National Taiwan University and headed to Japan to further his studies on marine biotechnology and resource management.

That was 45 years ago. At that time it would have been more common and easier to pursue a mainstream career and further his education in the U.S.A., but he had a broader vision for Taiwan, and he chose to pursue his advanced studies in another island nation - Japan. "I have never regretted my decision to pass up a more promising career like medicine or electronic engineering. And, thankfully, I have always had my family's full support." Clearly, he looks at the world with a different perspective than most people, and devoted his distinguished academic career to research and development of Taiwan's national marine resources.

七星山是陽明山國家公園最具代表性的錐狀火山，凹陷處是小油坑的爆裂口

Mt. Cising is a typical volcanic cone in the Yangmingshan National Park





海蛞蝓(王慶華 攝)
Sea slug (by Cing-hua Wang)



班卡拉蝸牛(蔡百峻 攝)
Pancala batanica (by Bai-jun Tsai)

得天獨厚的天然條件

小學開始就在地理課本上求得的知識，對張崑雄來說，是另一股驅使他深入探訪的動力。要論及福爾摩沙的海洋奧妙，他亮著眼、滔滔不絕的從台灣特有氣候與地理位置談起。

經地殼擠壓隆起浮出海面的台灣，島嶼上盡是高低起伏的地表現象，更有北迴歸線當分界，在地理上將台灣劃分成亞熱帶與熱帶海洋性氣候，加上島內各處山巒起伏，高聳垂直的山脈，最高海拔幾近4,000公尺，熱帶、溫帶及寒帶氣候的分布，讓山野間滿是百變的植物林相。

然而，台灣不只是植物生態多元，就連海洋生物物種也是琳瑯滿目，張崑雄認為，最特別的是，四面濱海的台灣島擁有1,600公里的海岸線，西部是沙岸、東部為岩岸、南部的鵝鑾鼻海域還有珊瑚礁，北部頂端更可見到珊瑚礁與岩岸的蹤跡。

張崑雄更補充道，台灣西部海域還有北方來的「親潮」洋流；東部海域有從菲律賓海域往日本流動的「黑潮」，一寒、一溫在台交會，讓海底的各式魚類趨之若鶩，一同齊聚在此，才造就台灣海域生物的多樣面貌。

Geography of Taiwan

The basic lessons he learned in geography class at elementary school triggered his desire for deeper knowledge. Picking the mysteries of Taiwan's marine world as a conversation topic with Professor Chang, you see how his eyes shine, and he talks non-stop, beginning with the basics of climate and geography.

After violent earth movements, Taiwan surged up from the bottom of the ocean, creating a land of exquisite variety, from snowy mountain highs to fertile lowlands. Extensive mountain ranges run north-south down the spine of the island, with the highest peaks reaching nearly 4,000 meters. Conversely, the coastal lowlands offer extensive plains for agriculture and industry. The Tropic of Cancer crosses directly through Taiwan, meaning the island has officially got both tropical and subtropical climates. There is a wide range of weather affecting the lush wet island, with both warm and surprisingly cold micro-climates created by the varied landscape.

Taiwan also shows great variety in ecology. Kun-hsiung Chang believes the 1,600km long coastline perimeter of Taiwan makes the island a unique place for marine life. The west coast has sandy beaches, but the eastern shores are more rocky. The southern tip of Eluanbi area has coral reefs, while the northern end has a combination of coral reefs and rocky points.

Kun-hsiung Chang describes how natural ocean currents traveling along the coast also enrich the diversity of marine life for Taiwan. The Oyashio Current travels from north to south along the western coastline, while the Kuroshio Current moves from the Philippines in the south, along eastern coast of Taiwan, and continues north to Japan. These two currents distribute cold and warm waters along the coastline of Taiwan, attracting a wide variety of fish and creating a rich underwater world for Taiwan.



從破壞中建設

台灣海域擁有的萬種風情，理應永續珍藏保育，但張崑雄在實地進行研究4、5年後，發現沿海魚種日益稀少，顯示海底資源正持續惡化中，為保護資源，張崑雄做了一項轉變。

在1968年自日本東京大學農學系所學成歸國的他，起初選擇專攻海洋生物資源研究，鎖定帶動漁業生物與海洋生態學，並力求學術理論與國民生計相結合。但到1972年時，張崑雄發現海洋資源流失、體認應回歸基礎，因此在隔年正式跨足海洋生態的研究與教學，甚至開始針對台灣海洋冷門但卻重要的議題，著手研究。

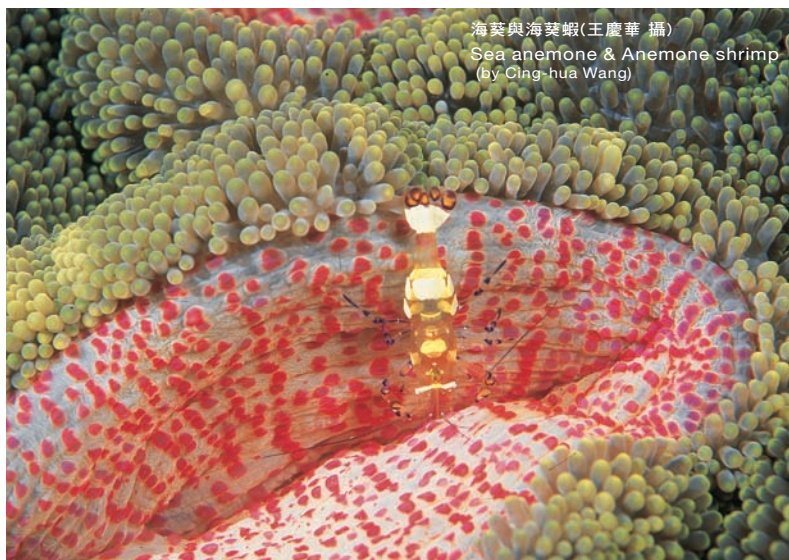
不想只在岸上做研究的他，堅持一定要親身經驗，所以在1971年時，他跑到美軍顧問俱樂部學潛水，目的只是想親眼看見更底層的海底生態。1972年，張崑雄帶頭潛入深海，為有效遏止資源面臨匱乏的窘境，他主張因時因地，適度施放人工魚礁，更不辭辛勞的躍進海底，親自監測、拍照，以最直接寫實的參與，督促行動的執行，另外也主張建立海洋牧場，培育沿岸海洋生物資源以增加漁獲。

Saving our Living Sea

It should be an easy job to maintain the marine treasures that we were blessed with in Taiwan. Unfortunately, after years of detailed study, Professor Chang has come to realize that the diversity and quantity of fish stocks in Taiwan are facing a grave risk of decline. To better understand the challenges of preserving Taiwan's marine resources, he turned the focus of his research to marine ecology.

Kun-hsiung Chang returned to Taiwan in 1968, after finishing his studies at the Bio-resource and Agriculture Department of the University of Tokyo, Japan. He contributed to the economic development of Taiwan by working in the field of marine biotechnology and resource management. Till 1972, he discovered how the fishing resources of Taiwan were being poorly managed, and he realized that a better understanding of the fundamentals was needed. The following year, he began to focus on a variety of little known but important issues in Taiwan's marine field.

He didn't confine his efforts to laboratory research. To gain a deeper and more direct perspective for his studies of the ocean, he became a certified scuba diver through lessons at the American Club in 1971. He became very active underwater, spending much time documenting threats to fisheries resources. He proposed setting up artificial reefs and marine farms to provide breeding grounds for unique species and to increase the volume of fisheries. While monitoring and surveying the underwater world, he took many photos, developing effective eyewitness evidence to support his recommendations.



海葵與海葵蝦(王慶華 攝)
Sea anemone & Anemone shrimp
(by Chng-hua Wang)



台灣櫻花鈎吻鮭(溫國彰 攝)
Oncorhynchus masou formosan
(by Kuo-Chang Wen)



優游墾丁海域的珊瑚魚群
(王慶華 攝)

The coral fish in the Kenting's
ocean (by Cing-hua Wang)

1977年，他也曾針對台灣東北部海域發生的布拉格油船污染事件，提出災害評估與具體補救之道；1981年，台灣出現蝦米螢光劑事件，造成社會大眾人心惶惶，張崑雄為此還主動進行研究，最後證實那僅是甲殼類原有的螢光反應化解疑慮。1984年，他更主持台灣國寶魚「櫻花鉤吻鮭」研究保護小組，全面禁絕捕獲櫻花鉤吻鮭，創下第一件為台灣保育面臨絕種危機動物的史例。1983年時，張崑雄更首度深入海疆，探查南沙海底的魚類資源，揭開海底的奧祕。

In 1977 there was a major oil spill when the Kuwaiti oil tanker Borag hit a reef and sank, leaking its 30,000-ton cargo of oil near Keelung Harbor in northeast Taiwan. Kun-hsiung Chang investigated the damage and participated in the evaluation report, which proposed a practical plan to minimize the impact on Taiwan's marine life. In 1981, when Taiwanese people became suspicious that shrimp sold in local fish markets had been polluted by chemicals which produce fluorescence, it was Kun-hsiung Chang who conducted the research into this event, proving that fluorescence was actually a natural biochemical process for this species of shrimp, and ending the social panic. In 1984, he was the chief of a commission for conservation of the *Oncorhynchus masou formosan* and supported legislation to forbid any catching of this endangered fish, considered to be a national treasure of Taiwan. It was the very first example of legislation to protect an endangered species in Taiwan's ecology conservation history.



海洋資源的科技外交

總是走在先鋒的張崑雄，因對海洋的努力，還曾榮獲代表國際青商會十大傑出青年的「金手獎」，也以《台灣沿海魚類生態》的紀錄短片獲得「金穗獎」、《海洋牧場之開發》得「金馬獎」最佳紀錄片，而《台灣自然大系—台灣珊瑚魚類》的圖書著作則勇奪「金鼎獎」。

Great Minds of Science

Kun-hsiung Chang has always been a pioneer, dedicated to conserving the beauty and significance of the life force of the sea. Because of his continuous advocacy, he has been honoured with many awards. He was once selected as one of the “Ten Outstanding Young Persons” of the year and he was also presented with the “Golden Hand Award” by the Junior Chamber International Taiwan. He won the “Golden Harvest Award for Film and Digital Video Film” for a documentary he produced called “The Fisheries Ecology in Taiwan”. Another documentary film he made, “The Establishment of a Marine Farm”, won him the “Best Documentary of the Year” in Taipei’s Golden Horse Film Festival. One of his books, titled “Ecology in Taiwan: Coral and Fish”, brought him a “Golden Tripods Award”.

圓管星珊瑚
Tubastraea aurea



變化多端的海岸地形構成一幅幅美麗的風景
The changeable coastal constitutes a beautiful scenery



數不盡的獎項，都是張崑雄對海洋無私奉獻的勳章，但張崑雄並不以此而自滿，對他來說，如何保育並善用資源，才是此生唯一的目標。接下來的張崑雄，認為「海洋政策」是未來要更著力的方向，而整合台灣海洋的保育單位導向務實面，也是當務之急，更重要的是，利用台灣獨特的海洋資源，以學術研究的方式走進國際，做好科技外交，更是海域價值所在，畢竟「不是政治往往就是最好的政治」。

套句張崑雄現指導研究生潘宇翔的話，「溯古至今，能精確達到學術與實務並重的人，非國寶級張崑雄老師莫屬」，但張崑雄卻自謙的說，「台灣的海域資源，學無止境」。

張崑雄為美麗的福爾摩沙海域，闢建一條寬廣的路，致力於薪火相傳與永續發展的他，也期盼有心人士，能一同加入。

Kun-hsiung Chang's many awards and accolades are just one indication of his selfless contribution to the study of Taiwan's ocean resources. Professor Chang doesn't feel limited by the relatively narrow focus of his hard work. For him, dedication of his energy to the conservation and management of marine resources is a lifetime business and his only goal. As his next step, Kun-hsiung Chang thinks Taiwanese people should focus more on establishing a better national marine policy, organizing all maritime conservation organizations and related government departments and directing their combined efforts towards more coordinated and practical actions. Most important, to maximize Taiwan's marine resources, we should combine the expertise of our domestic organizations with the efforts and knowledge of the global international community.

One of his undergraduate students, Yu-xiang Pan, speaks highly of Professor Kun-hsiung Chang, calling him a national treasure, a scholar who is not only focused on academics, but also capable in the practical field. Kun-hsiung Chang believes that the field of oceanographic studies is limitless, like the ocean itself, and a lifetime of study will never reach the end.

Kun-hsiung Chang has pioneered the study of the oceans for Taiwan, building a foundation from which he encourages others to continue to expand his work, contributing their own efforts to the perpetuity of our marine resources.



張崑雄小檔案 Kun-hsiung Chang



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Ph.D. Agriculture Department of the University of Tokyo.
The chairman of Society of Streams (R.O.C.), Once was appointed the committee chairman of International Union of Biological Science (IUBS) and so on.