

14 LIFE BELOW WATER



Research & Innovation

Revitalising Marine Ecosystems through Oyster Reef Rehabilitation

With research grants totalling **around HK\$1.2 million, supported by the Pew Charitable Trusts, the Hong Kong Offshore Liquefied Natural Gas Terminal Project Fisheries Enhancement Fund, and Hang Seng Bank**, the Department of Food Science and Nutrition led a project focuses on restoring Hong Kong's historic pearl oyster reefs to enhance marine biodiversity, improve water quality, and revive the local pearling industry through sustainable aquaculture. Overharvesting in the past led to the disappearance of these reefs, affecting both marine ecosystems and the livelihoods of local fishermen. Hatchery-sourced pearl oysters are used to rebuild reefs in **more than five local aquaculture zones**. Furthermore, pearl oysters have the unique ability to extract carbon from

seawater through the formation of calcareous shells and pearls, contributing to carbon neutrality initiatives.

To foster awareness about marine conservation, advanced 3D technologies that supported reef reconstruction also facilitated the development of engaging educational tools. Students can participate in guided farm tours, hands-on internships, and STEM-focused programmes centred on oyster ecology and sustainable aquaculture, deepening their understanding of marine conservation. Contributing to community development and ecological sustainability, fostering environmental awareness and resilience, the project also contributes to Zero Hunger (SDG2) and Climate Action (SDG13) by promoting sustainable aquaculture and supporting nature-based carbon sequestration efforts.



Mapping Microplastic Distribution to Safeguard Aquatic Ecosystems

With a funding of **nearly HK\$1.4 million from the Environmental Protection Department of the Government of the HKSAR**, the Department of Food Science and Nutrition conducted a baseline survey to assess microplastic pollution in Hong Kong's rivers, covering sampling sites across 10 major rivers and streams that represent diverse geographical and environmental conditions and varying levels of human activity. The study generated up-to-date data on microplastic prevalence, revealing critical insights into the distribution and severity of pollution in freshwater systems. By analysing these patterns, the research provides policymakers with evidence to implement targeted pollution control and mitigation strategies, supporting healthier aquatic ecosystems and sustainable river management.



Teaching & Learning

Advancing Sustainable Diets for Marine Biodiversity and Aquatic Ecosystems

The subject “The Environmental Impact of the Dietary Culture in China”, offered by the Department of Food Science and Nutrition, introduces students to the environmental and ecological implications of dietary culture in Chinese Mainland, with a particular focus on marine resources. Students examine the live reef food fish trade and learn how overfishing and unsustainable harvesting practices threaten biodiversity, thus leading to species extinction, and disrupting aquatic ecosystems.

By exploring the intersection of traditional food practices, food chemistry, and nutrition, students gain a deeper understanding of the social responsibilities associated with human consumption. The course encourages critical reflection on how dietary choices influence the sustainability of marine resources and overall biodiversity.

Through seminars and applied discussions, students are empowered to identify alternative food options and production methods that minimise environmental impacts. Importantly, the subject fosters an awareness of responsible consumption and equips students with the knowledge and skills to advocate for sustainable practices that protect biodiversity and support the long-term health of marine ecosystems.

Bridging Marine Health and Food Sustainability

Offered by the Department of Food Science and Nutrition, the subject “Environmental Health and Food Sustainability” engages students in understanding the intricate links between food production, environmental health, and ecosystem sustainability. By examining fisheries from environmental, ecological, nutritional, and social sciences perspectives, students gain insight into how human practices affect aquatic ecosystems and the broader environment. The subject emphasises the importance of preserving biodiversity and responsibly managing marine resources to ensure long-term sustainability.

Students investigate the consequences of overfishing and other unsustainable practices on marine life and the environment. Through analysis of current fishery methods and case studies, they explore ways to mitigate environmental harm while maintaining food supply. Topics, such as coral reefs which are crucial ecosystems supporting biodiversity and food sustainability are also discussed.

By the end of the course, students are equipped to critically evaluate the environmental impacts of food systems and to propose solutions that support both ecosystem health and sustainable food supply. The learning experience fosters a sense of responsibility for conserving biodiversity and managing marine resources, empowering students to advocate for practices that balance human needs with ecological integrity.

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External Engagement

Turning Plastic Waste into Ocean Protection

The Material Resource Centre of the School of Design hosted a mini-exhibition in collaboration with #tide ocean material®, spotlighting how plastic waste collected from coastlines and waterways can be transformed into durable, high-quality products. Rather than polluting oceans and harming marine life, this waste is repurposed into items ranging from watches and apparel to furniture, flooring, and even construction materials.

The exhibition not only promoted the idea of reducing ocean-bound plastic to protect the ocean but also demonstrated how innovative design and circular business models can reshape the way communities view waste. By showing how plastic waste can be reintroduced into the value chain as granules, yarn, and filament for a variety of industries, it inspired visitors to rethink everyday consumption habits.

The initiative highlighted the wider environmental and social benefits of tackling marine plastic pollution: reducing threats to biodiversity, preventing the creation of microplastics, and mitigating the economic harm caused to fisheries and tourism. Through collaboration and knowledge sharing, the exhibition engaged **around 2,000 visitors**, encouraging collective action towards healthier oceans and a more sustainable future. Importantly, #tide's work also supports vulnerable communities by partnering with local non-profits and social enterprises in the first mile of its supply chain.



Governance & Operations

Championing Marine Protection with Eco-Conscious Dining Initiatives

PolyU has been taking progressive steps to minimise the use of single-use plastics and to promote sustainable dining practices across campus. The University first introduced the "NO STRAW Every Day" arrangement, and since April 2024, all catering outlets have complied with the new Regulation of Disposable Plastic Tableware, which prohibits the distribution of plastic straws, cutlery, and plates for both dine-in and takeaway services.

To further reduce plastic waste, PolyU discontinued the sale of single-serving, less than a litre bottled water in vending machines, convenience stores, and catering outlets starting from 2017. The same restriction applies to University activities and events, encouraging the community to embrace the use of reusable water containers and reinforcing environmentally responsible habits.

The University has also pledged to promote eco-conscious food consumption in official functions. By supporting WWF-Hong Kong's Sustainable Seafood Week and signing the "Say No to Shark Fin" pledge, the University actively excludes shark fin, bluefin tuna, humphead wrasse, wild-caught Hong Kong grouper, sturgeon caviar, black moss and other threatened species from its menus.

