SDG 14

Conserve and sustainably use the oceans, seas and marine resources for sustainable development

Courses **5**

Researchers **3**

Research Outputs **168**
FWCI:1.26

Outreach **11** events
890 participants

The Education University of Hong Kong is dedicated to the conservation and sustainable use of our oceans, seas, and marine resources. Through targeted research, preventative operational measures, and specialised educational outreach, the University is actively contributing to the protection of marine ecosystems and fostering a deeper understanding of the vital role they play for our planet.

Fostering Environmental Stewardship Through Innovative Education

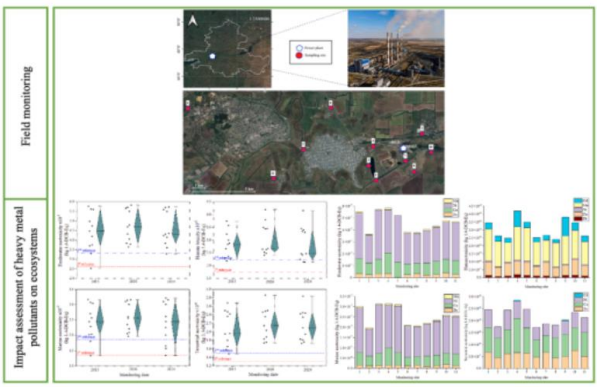
In support of Sustainable Development Goal 14 (Life Below Water) and broader environmental objectives, The University is at the forefront of cultivating environmental literacy and action through pioneering educational initiatives.

A key component of this strategy is the course on **Environmental Science and Urban Sustainability**, which equips future educators with a comprehensive understanding of ecological systems, urban environmental challenges, and sustainable practices. The course integrates real-world case studies and data interpretation to build critical thinking skills, empowering students to translate theoretical knowledge into practical solutions for a more sustainable future.

Furthering this commitment, the Department of Curriculum and Instruction has launched a new **Senior Primary Science Curriculum**, developed to align with the Education Bureau's latest framework. Titled '**From Arctic Exploration to Marine Ecological Sustainable Development and Global Citizenship**', this innovative curriculum moves beyond traditional classroom learning. It incorporates diverse teaching methods, including insights from Arctic research expeditions, to connect scientific concepts with real-world exploration and foster a deeper understanding of global marine ecological challenges.

Scheduled for a pilot in the 2024/25 academic year, the curriculum uses illustrated journals from Arctic explorations, English-medium science lessons, and social service activities to spark curiosity and a sense of global citizenship among pupils. This approach is designed not only to enhance scientific literacy but also to empower students to devise strategic conservation plans and to prepare them for a seamless transition to secondary education.

Informing Policy to Safeguard Aquatic Ecosystems from Industrial Pollutants



Research excellence at EdUHK contributes vital knowledge to the global effort to protect marine and aquatic ecosystems. A 2025 study published in the Journal of Hazardous Materials, co-authored by Professor M.H. Wong of EdUHK, investigates the environmental and health risks posed by heavy metal contamination from industrial activities.

The research focused on soils surrounding a coal power plant, revealing that concentrations of lead, zinc, copper, nickel, manganese, cadmium, and chromium exceeded established safety thresholds. Although primarily examining terrestrial ecosystems, the findings have profound implications for marine environments. The study highlights that heavy metals can leach from contaminated soil into water bodies, posing a significant threat to aquatic biodiversity. This contamination can enter the food chain, leading to bioaccumulation that ultimately affects human health. The life cycle assessment within the research indicated that ecotoxicity in marine and freshwater environments increased by over 30% compared to average pollutant levels, with nickel being the main contributor.

This research underscores the critical necessity for stringent monitoring and management of pollutant emissions from industrial sources. By providing robust scientific evidence on the long-term consequences of heavy metal accumulation, this work directly supports the objectives of Sustainable Development Goal 14—to conserve and sustainably use the oceans, seas, and marine resources—and informs strategies to protect these vital ecosystems.

Source: Kravchenko, E., Minkina, T., Mandzhieva, S., Bauer, T., Lacynnik, E., Wong, M. H., & Nazarenko, O. (2025). Ecological and health risk assessments of heavy metal contamination in soils surrounding a coal power plant. *Journal of Hazardous Materials*, *484*, Article 136751

Advancing Marine Science and Conservation through Research

The University is dedicated to advancing marine conservation and the sustainable use of aquatic resources through pioneering research. This commitment is reflected in the global standing of our researchers, with 49 EdUHK scholars named in Stanford University's 2024 list of the world's top 2% most-cited scientists. This cohort includes leading experts such as Professor Rudolf Wu Shiu-sun, the inventor of the groundbreaking 'artificial mussels' used to monitor radioactive contamination in waters worldwide, underscoring our institutional focus on protecting life below water.

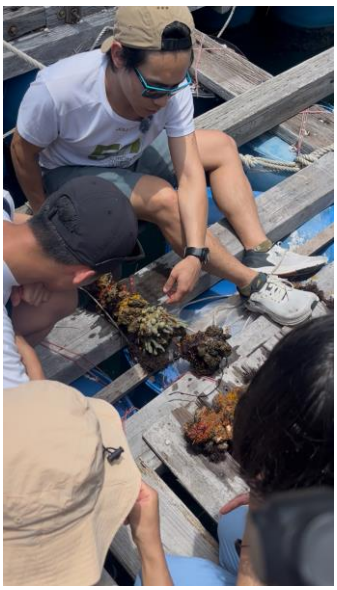
This research excellence translates into practical, award-winning solutions. At the 3rd Asia Innovation and Invention Exhibition, a gold medal was awarded to a project 'Rapid Quantification of Microplastics Using Total Organic Carbon Analysis with Simple Sample Pretreatment' by Dr Tsang Yiu-fai for a device that rapidly quantifies microplastic pollution in water. A silver medal was awarded to a 'Nano-Sensor System for Meat and Seafood Monitoring' developed by Professor Stephen Chow Cheuk-fai, which monitors seafood freshness to help reduce waste. These achievements highlight our commitment to developing tangible solutions that protect our oceans and contribute to a sustainable future.

Fostering Marine Stewardship Through Citizen Science

The University is actively fostering a deeper community connection to marine conservation through interdisciplinary dialogue and hands-on citizen science. A key initiative is the "**Citizen Science Sustainability Dialogue and Practice**" stream, part of the University's Sustainable Humanities Project (SUSHUM). This project, generously funded by EdUHK's Central Reserve Allocation Committee, brings together humanities scholars and natural scientists to address the urgent challenges of climate change.

Under this framework, the "**Waters Will Know: Inter-disciplinary Citizen Science Workshop**" series was launched in 2024. Held across May, July, and August, these workshops focus specifically on Hong Kong's water biodiversity under climate change. In partnership with a local NGO, the project features three fieldwork sessions studying the coastal ecology and marine environments of Hong Kong's offshore islands.

This initiative provides a vital platform where community members, university students, and researchers collaborate to monitor and understand fragile aquatic ecosystems. Through hands-on fieldwork, participants are empowered to contribute directly to conservation efforts while gaining a greater understanding of the threats posed by climate change and biodiversity loss. By bridging scientific research with community engagement, EdUHK not only enhances scientific literacy but also inspires meaningful public action to safeguard our precious marine resources.



14 LIFE BELOW WATER

Nurturing Environmental Stewards through Community Action

The University, through its Student Affairs Office, actively fosters environmental responsibility through the **EdUTeer "Eco Master!" programme**. This green volunteer and community education initiative is designed to cultivate a profound understanding of ecological issues and promote conservation action among our students.

In collaboration with expert organisations such as Outdoor Wildlife Learning Hong Kong (OWLHK), the programme provides students with immersive, hands-on learning experiences. Recent activities included a '**Forest Ecology Activity Day**' and a '**Free Ocean Day**', which combined theoretical knowledge with practical fieldwork.

During the 'Forest Ecology Activity Day', students participated in thematic talks on biodiversity and engaged with interactive learning tools before undertaking a field trip to the Tai Po Kau Nature Reserve. A key component of this initiative was equipping our students with pedagogical theories on environmental education, empowering them to design and deliver effective, engaging activities for primary school pupils.

The 'Free Ocean Day' focused on marine conservation, taking students to the ecologically significant mudflats of Ting Kok, a designated Site of Special Scientific Interest. Participants studied coastal wildlife and the detrimental impact of plastic pollution on marine habitats. The day culminated in a shoreline clean-up and a marine debris survey, where students collected and analysed waste to better understand the sources of local ocean pollution and reflect on solutions.

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From Campus to Coastline: Cultivating Champions for Marine Conservation

The University is committed to fostering a profound understanding of and sense of responsibility for our marine environments. This commitment is vividly demonstrated through the impactful careers of our alumni, who translate their academic learning into tangible conservation action.

A compelling example is Kelvin So, a graduate of EdUHK's Bachelor of Arts (Honours) in Education for Sustainability programme. Now serving as the Manager of Ocean Conservation at WWF-Hong Kong, Kelvin is at the forefront of local marine protection efforts. His work involves advocating for the government to designate 30% of Hong Kong's waters as Marine Protected Areas (MPAs) by 2030, a significant increase from the current 5%.

Inspired by a SCUBA diving experience during his studies at EdUHK, Kelvin actively raises awareness about the surprising richness of Hong Kong's marine biodiversity. He highlights that local waters, such as those around the Ninepin Group in Sai Kung, host vibrant and diverse coral communities comparable to renowned international diving locations. Through the dedication of alumni like Kelvin, EdUHK's influence extends beyond the campus, empowering a new generation of leaders to protect and preserve our vital marine ecosystems for a sustainable future.

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