

Lingnan University 2024/2025 SDG Report

SDG 14 – LIFE BELOW WATER



28
Undergraduate Courses



120 Ocean Environmental
Pioneers (OEPs) Reached



78
Research Outputs



67
Research Projects and Grants

Lingnan University is dedicated to advancing SDG 14 – Life Below Water through research, education, and community engagement that promote the protection and sustainable use of marine and coastal ecosystems. Partnering with government agencies, non-governmental organizations, and international collaborators, Lingnan integrates ecological research with innovative, nature-based solutions to enhance ecosystem resilience and biodiversity conservation.

Through interdisciplinary programmes and experiential learning, the University equips students with the knowledge and skills to address marine protection, sustainable aquaculture, and coastal management challenges — reflecting Lingnan’s ongoing commitment to building a sustainable ocean future.

Research Projects and Publications

Supported by various funding sources, including Hong Kong SAR Government departments such as the Research Grants Council, Environmental Conservation Fund, Agriculture, Fisheries and Conservation Department, and Civil Engineering and Development Department; Lingnan University’s internal research funds (DG, FRG, LWRF); and non-governmental organizations including The ADM Capital Foundation Ltd., The Conservancy Association, and Shenzhen Shuanghuamu Biotechnology Co., Ltd., Lingnan University has undertaken extensive research and produced publications that raise public awareness and inform policymakers about the

importance of wildlife conservation. Three key ongoing research projects for 2024–25 are highlighted below:

1. Wise Use of Wetlands: Understanding Novel Community Assembly Processes Across Human-Modified Landscapes

This project investigates how coastal development influences wetland biodiversity, contributing to SDG 14 – Life Below Water. Drawing on a 24-year dataset on waterbirds from Hong Kong and Shenzhen, the study examines how bird communities respond to increasing human activities and environmental changes. By integrating historical ecological data with insights from local aquaculture and wetland management practices, the research aims to develop nature-based solutions that support both biodiversity conservation and sustainable aquaculture. The findings will inform more effective strategies for managing and restoring coastal wetlands, ensuring the long-term health and resilience of these vital ecosystems.

2. Forgotten Habitat: Physical Environments and Biodiversity Patterns of Hong Kong Intertidal Boulder Fields

This project investigates the physical environment, biodiversity, and their interactions in one of Hong Kong’s least studied yet common coastal habitats — the intertidal boulder fields. These habitats can be considered “soft” hard shores, as boulders provide solid surfaces for marine organisms while remaining subject to wave-induced disturbance. Biodiversity patterns within boulder fields depend not only on such physical disturbances but also on environmental factors including habitat availability and levels of physical stress. By utilizing the diversity of boulder fields across Hong Kong’s hydrological gradient, this project documents species diversity and quantifies how species richness and community structure vary in relation to environmental conditions. The findings contribute to SDG 14 – Life Below Water by advancing understanding of Hong Kong’s coastal biodiversity and the ecological processes shaping one of its key coastal habitats.

3. The Missing Link in Understanding Species Performance: The Role of Thermoregulatory Behaviours Under Early Warning Signals of Heat Stress

This project investigates a key process for species survival on physically harsh tropical rocky shores — behavioural thermoregulation. As global temperatures rise, coastal species are increasingly affected by heat stress and are shifting their distributions to track suitable thermal habitats. Slow-moving organisms such as snails, limpets, and chitons are especially vulnerable, as environmental temperatures in tropical regions already approach or exceed their physiological limits.

To cope with these conditions, such species actively seek thermal refuges during stressful

periods. This project focuses on understanding the causes and consequences of these behavioural responses. By modelling experienced thermal cues and assessing the energetic impacts of heat stress, the study contributes to SDG 14 – Life Below Water and SDG 13 – Climate Action, enhancing understanding of how intertidal organisms respond to climate change and predicting the broader ecological consequences of global warming on coastal biodiversity.

Highlighted on-going projects in 2024-25:

- 1) Exploring the hidden fish community and fishery value of estuarine mangroves in western Hong Kong waters through environmental DNA metabarcoding
- 2) Research and Monitoring on Rosy Bitterling *Rhodeus ocellatus* and freshwater fish at Ho Sheung Heung Area, Sheung Shui
- 3) Using eDNA metabarcoding to monitor the changes in fish communities after the deployment of artificial reefs in South Lantau Marine Park
- 4) Chromosome-level reference genome of the Golden Coin Turtle (*Cuora trifasciata*)
- 5) Environment and Conservation Fund Forgotten Habitat: Physical Environments and Biodiversity Patterns of Hong Kong Intertidal Boulder Fields
- 6) Environment and Conservation Fund Monitoring and Eradication of Invasive Crayfish Using Mark-recapture and eDNA Methods

Educational programmes and courses

The Master of Science in Sustainability and Environmental Analytics (SEA)

Lingnan launched the Master of Science in Sustainability and Environmental Analytics (SEA) in 2024-25, accumulative with a total of approximately 80 students enrolled in the programme. The programme includes courses centered on sustainability, environmental science, and data analysis, designed to provide students with the essential knowledge and skills to address the challenges of sustainable development and environmental management. The programme offers courses that emphasize achieving SDG14 Life below water from an interdisciplinary approach, such as SCI503 Sustainability and Environmental Communication explore the complexities of various coastal issues facing society today, while SCI508 Practical and Research Training: Topics in Environment, Society, and Sustainable Future provides students with the opportunity to conduct ecological surveys using appropriate sampling tools in Hong Kong's coastal and terrestrial ecosystems.

Minor in Environmental and Scientific Literacy

In response to the rapid growth of the human population and ongoing technological advancements, Lingnan introduced the Minor in Environmental and Scientific Literacy in 2020–21. This minor programme emphasizes the development of “science literacy” as an

essential lifelong skill, equipping students to address a range of scientific and technological issues. The curriculum offers non-science students the opportunity to engage with topics related to sustainable development through two required courses and three elective courses, including areas such as environmental science, conservation, biodiversity, and climate change. Furthermore, the practicum course SCI3008 Internship in Environment and Sustainability in 2024–25, has fostered partnerships with 15 distinguished organizations across various sectors, including A Plastic Ocean, the Hong Kong Maritime Museum, and the Hong Kong Science Museum. These collaborations provide students with hands-on experiential learning opportunities, enabling them to gain a deeper understanding of marine conservation through diverse fieldwork activities.

MPhil and PhD in Environmental Science

To equip students with a strong theoretical background in environmental sciences, as well as provide a diversity of hands-on, experiential experiences needed to be successful in this field. Lingnan established the MPhil and PhD Programmes in Environmental Science in 2020-21 and 2023-24 respectively. Students are supervised by a team of eight distinguished faculty members and undertake individual research projects across diverse areas, including (1) Evolution, Ecology, and Conservation; (2) Geographic Information Systems, Urban Climate; and (3) Environmental Health, Renewable Energy, and Applications. 9 students have graduated from the programme and are now working in various NGOs and government sectors focused on biodiversity and environmental conservation, thereby playing a vital role in promoting public education on sustainable environmental practices.

Some students specializing in Freshwater and Intertidal Ecology within the field of Evolution and Ecology concentrate their research on marine ecology topics, such as examining the marine environment, exploring the interactions between introduced and native species, and assessing endangered turtle populations in Hong Kong's freshwater ecosystems. Upon completing their research, students will present their findings in a public seminar. This initiative aims not only to enhance the MPhil students' expertise in marine ecology, while also raising public awareness about marine habitats in Hong Kong.

Undergraduate courses

Among the courses recently offered in Lingnan, 28 undergraduate level courses address SDG14 Life Below Water, with 8 out of the 28 highly focus on marine pollution and environmental conservation. The courses with content highly related to SDG14 are as follows:

- Life Sciences: The Way Life Works
- Understanding Evolution
- Ecology:SciEnvironmentalIssues
- Blue Planet
- Human-Animal Relationship in History

- Conservation and Biodiversity
- Earth Science
- Community Engage Service-Learning