

## Marine Research

**Marine Research (MR)** is a peer-reviewed open-access journal published by the National Academy of Marine Research (NAMR). Volume 5 Issue 2 is honored to present two special themes, each led by distinguished guest editors who have made significant contributions to their respective fields.

The first theme, "**Ports, Shipping and Navigation**," guest-edited by Dr. Solomon Chen (Taiwan Association of Maritime Safety and Security), highlights the key transformations shaping today's maritime industry. The papers in this section highlight three key priorities in modern port and shipping development: enhancing port resilience through digital and Industry 4.0 technologies, advancing liquefied CO<sub>2</sub> shipping for global decarbonization, and strengthening port security in line with international standards. Together, they offer a clear view of how innovation and governance are shaping the future of maritime operations.

Continuing from the previous volume, the second theme "**The Taxonomic Study of Fishes in Taiwan II**," is guest-edited by Dr. Hong-Young Yan (Research Fellow (Emeritus) of Institute of Cellular and Organismic Biology, Academia Sinica). This issue features new discoveries and updated records of freshwater and estuarine fishes in Kinmen, along with a review of the long-term conservation achievements of the Formosan landlocked salmon. These studies collectively offer a clear and accessible perspective on the continued progress of fish taxonomy and conservation in Taiwan.

In general, these two themes showcase the breadth of Taiwan's marine research from the operational and technological challenges of global shipping networks to the scientific and historical exploration of marine biodiversity. The dual-focus structure of this issue underscores MR's commitment to supporting diverse scholarship that reflects the dynamic and multifaceted nature of marine science.

MR is published in June and December. All articles are available Open Access through the MR official website (<https://marres.namr.gov.tw/>). Given your eminence and contribution to the field of marine research, we warmly invite you to submit your research for publication at MR. We look forward to receiving your manuscripts.

Best regards,

Chung-Ling Chen, Ph.D.

Editor-in-Chief, President of National Academy of Marine Research

*Chung-Ling Chen*

## Ports, Shipping and Navigation

The sea has never been silent. It carries the echoes of bustling trade routes and shelters the quiet persistence of centuries of seafaring. For me, it has never been merely a subject of study, but a lifelong companion—one that reveals humanity's ambitions, mistakes, and enduring desire to voyage onward. Having witnessed the consequences of regulatory gaps, the cost of technological complacency, and the fragility of maritime systems, I have come to believe that maritime safety is not solely a matter of engineering or governance. It is a moral undertaking: a commitment to coexist responsibly with the oceans that sustain us.

The three studies presented in this special issue resemble beacons illuminating the way forward for global maritime development.

The first paper, "*The Impact of Industry 4.0 Technologies on Port Resilience: A Review*," reminds us that when ports become 'smart', they are not merely becoming faster or more efficient. They are cultivating resilience—a quality that protects the livelihoods of seafarers and the pulse of international trade, particularly in times of disruption. Resilience is not an abstract metric; it is the warmth of a harbour that remains steadfast when storms set in.

The second contribution, "*Advancing Liquefied CO<sub>2</sub> Shipping: Technical Considerations for Ship Cargo System Design*," directs our attention to a deeper challenge. As humanity learns to capture, store and transport its own emissions, we are not only engineering new systems—we are attempting to mend the damage inflicted upon our shared planet. The development of LCO<sub>2</sub> shipping is, therefore, more than a technical enterprise. It represents a commitment to ensure the oceans are not treated as a repository for excesses, but as a partner we must protect.

The third study, "*Enhancing Port Security Management in Taiwan's International Commercial Ports*," resonates with the resilience of an island accustomed to uncertainty. Although Taiwan is excluded from formal membership within the IMO, it has long upheld the ISPS Code, insisting that maritime security and international trust require

no formal recognition to be honoured. This research offers more than a governance framework—it is a testament to an island state's determination to participate responsibly in global maritime affairs.

Together, these studies affirm that the future of ports and shipping will depend upon three intertwined commitments: to listen to the sea through technology, to repair our impact through sustainable action, and to respect the sea through robust maritime governance.

To all authors, reviewers and colleagues who have contributed to this issue, I extend my sincere appreciation. May every reader find, between these pages, not only analysis and data, but also a broader understanding of what the sea demands of us. For the ocean is:

not merely a resource, but a living presence;  
not a boundary, but a bridge;  
not a subject of study, but part of our shared future.

Best regards,  
Solomon Chen, Ph.D.  
Guest Editor, Taiwan Association of Maritime Safety and Security

A handwritten signature in black ink, appearing to read "Solomon Chen".