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CHAPTER 23

Conservation status of corals in Malaysia

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Abstract: Malaysia, located within the Coral Triangle Initiative on Coral Reefs, Fisheries, and Food Security Implementation Area, is home to 1,687 km^2 of coral reefs that support 501 species of hard corals. These coral reefs host high biodiversity that plays a vital role in supporting fisheries, tourism, and coastal protection. Currently, the health of Malaysia's coral reefs is rated as fair, with an average live coral cover of 44.65%. However, recent data from Reef Check Malaysia's 2025 monitoring program show that coral reef health is in decline nationally, with average live coral cover dropping for the third consecutive year. This trend highlights that current coral reef conservation efforts are not sufficient to address ongoing threats. Key challenges include fragmented management, weak governance, limited stakeholder involvement, insufficient funding, poor waste management, and sporadic research. To protect and restore these coral reefs, Malaysia needs a coordinated national approach that unites State and Federal government agencies, scientists, local communities, and other stakeholders. Correspondingly, improving land-sea management integration is a crucial step toward securing the future of Malaysia's coral reefs.

INTRODUCTION

Malaysia is located in the South China Sea and sits within the Coral Triangle Initiative on Coral Reefs, Fisheries, and Food Security Implementation Area (Figure 1). The country has a coastline of 4,675 km and an Exclusive Economic Zone (EEZ) area of 334,671 km^2, which includes 1,687 km^2 of coral reefs (Coral Triangle Atlas 2025; Leong 2025). These reefs are home to an incredible variety of life, including 1,428 species of coral reef fish and 386 taxa of seaweed and algae (Phang *et al.* 2007; Chong *et al*. 2010). Coral reefs are not only rich in biodiversity, but they are also vital to the economy and the well-being of millions of Malaysians. They help support tourism and provide income for coastal communities (Academy of Sciences Malaysia 2022). With a population of about 34.2 million people (Department of Statistics Malaysia 2025), nearly all Malaysians live within 100 km of the coast (Asian Development Bank 2014), showing Malaysians are deeply connected to the sea.

Malaysia's coral reefs are under threat from various sources. Rising sea temperatures, coastal development, overfishing, pollution, and irresponsible tourism are damaging these fragile ecosystems. This leads to the loss of marine life, reduced income for local communities, and reduced food security, as well as making it harder for these coral reefs to recover from future environmental changes (Asian Development Bank 2014; Yu and Wee 2023; Reef Check Malaysia 2025). To help protect these coral reefs, Malaysia has established 51 marine protected areas, covering about 3,856 km^2 of its marine areas (Coral Triangle Atlas 2025).

Present status

Malaysia's coral reefs contain 501 species of hard corals (Scleractinia) recorded across the country. Out of the 501 species, only 56 species have been found in the Malacca Strait region, while 398 species have been found in the Sunda Shelf region, and 382 species in the North Borneo region (Figure 2). Although it might seem surprising that the Sunda Shelf has

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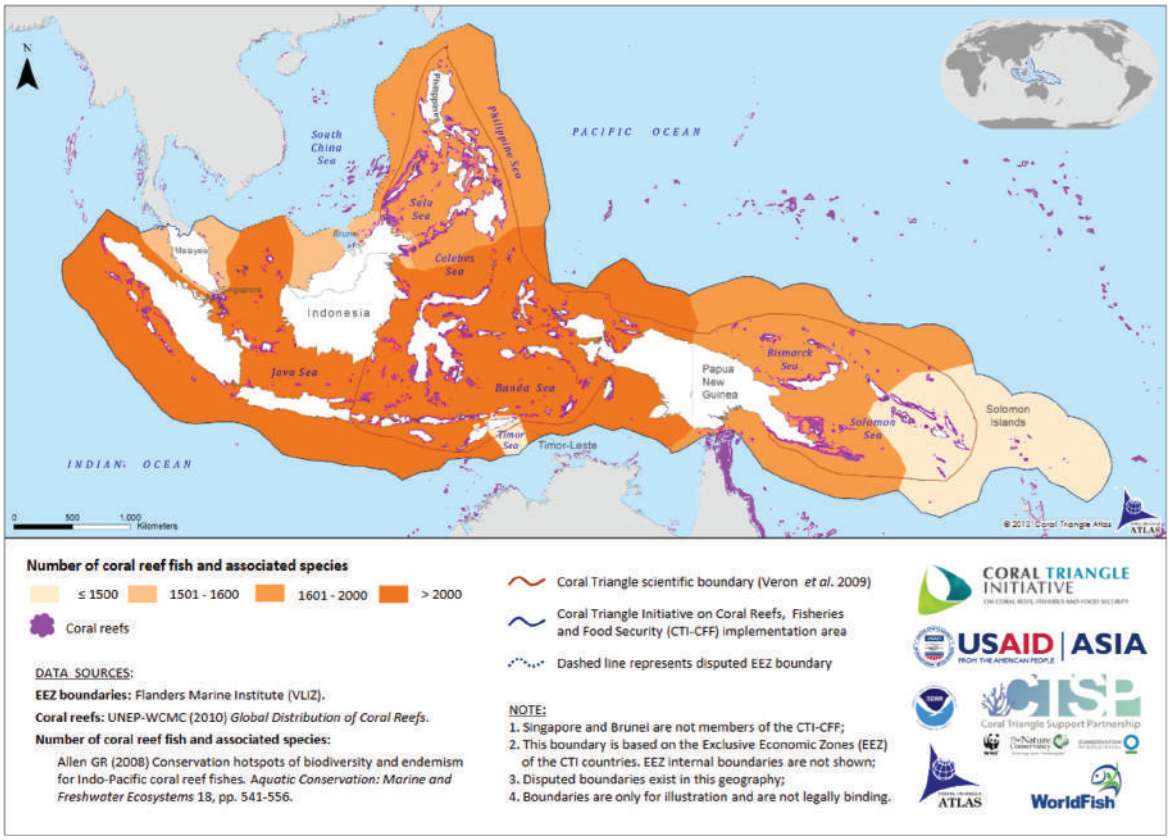

Figure 1. Map showing Malaysia situated within the Coral Triangle Initiative on Coral Reefs, Fisheries, and Food Security Implementation Area (Coral Triangle Atlas 2025).

more reef coral species than North Borneo, this may be due to limited research and data from the North Borneo region (Waheed 2016). In general, coral diversity decreases with increasing distance from the centre of the Coral Triangle (Carpenter *et al.* 2011). One of Malaysia's most important coral reef areas is Semporna, located in eastern Sabah. Semporna sits just inside the boundaries of the Coral Triangle and has the highest concentration of coral reefs in the country. It also boasts the richest variety of mushroom corals (Fungiidae), even more than some other areas within the Coral Triangle (Waheed and Hoeksema 2013).

In 2024, Reef Check Malaysia conducted its annual coral reef monitoring surveys at a total of 41 coral reef locations, covering 315 individual sites: 22 locations (157 sites) in the Sunda Shelf, five locations (22 sites) in the Malacca Strait, and 14 locations (136 sites) in North Borneo. These surveys covered both marine protected areas and non-protected areas, mostly around islands. Based on Reef Check Malaysia's 2024 coral reef monitoring surveys data and the classification system developed by Chou *et al*. (1994), Malaysia's coral reefs are currently in fair condition with an average of 44.65% live coral cover. When looking at different regions, Sunda Shelf reefs are in good condition with an average of 50.21% live coral cover, Malacca Strait reefs are in fair condition with 36.36% live coral cover, and North Borneo reefs are also in fair condition with 39.56% live coral cover. Across these locations, 39.02% were in good condition, 51.22% were in fair condition, and 9.76% were in poor condition. None were found to be in excellent condition. A breakdown by region shows over half (54.55%) of the coral reef locations surveyed in Sunda Shelf were in good condition and the rest in fair, 80% in Malacca Strait were in fair condition and 20% in good, and 50% in North Borneo were in fair condition, 28.57% in poor, and the remaining in good (Reef Check Malaysia 2025).

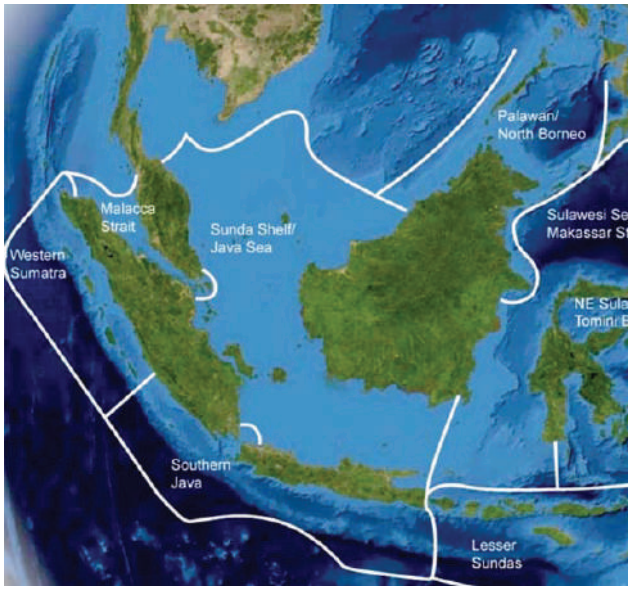

Figure 2. Map showing the Malacca Strait, Sunda Shelf and North Borneo marine ecoregions as defined in the Marine Ecoregions of the World (MEOW) classification scheme (Huffard *et al*. 2012).

Malaysia's coral reefs are facing threats from both human activities and environmental stress (Figure 3). According to Reef Check Malaysia's 2024 coral reef monitoring, about 83% of coral reef locations surveyed were heavily affected by discarded fishing nets and marine trash and 56% showed damage from boat anchors. In Sabah, a worrying 64% showed signs of dynamite fishing, an illegal practice that causes extensive reef destruction. High levels of disturbance indicators such as recently killed coral, rubble, and silt were found across all regions. Some of the worst affected coral reef locations include Tunku Abdul Rahman Park (over 50% disturbance indicators) and Pulau Redang (over 40%). Pulau Pangkor, Malacca, Port Dickson, Pulau Mantanani, Pulau Mataking, Pulau Penyu, Pulau Sipadan, and Tun Sakaran Marine Park recorded between 20% to 30% disturbance indicators. High pollution indicator levels were mainly found in the Malacca Strait and Sunda Shelf regions. Locations with notable pollution issues (over 10%) include Pulau Sembilan, Port Dickson, Lang Tengah, Aur and Dayang, Besar, Pemanggil, Sibu and Larapan.

While crown-of-thorns starfish, which feed on coral, are generally not a widespread issue in Malaysia, they are causing local problems in Pulau Tioman, Pulau Bidong and Yu, Pulau Pemanggil and Lahad Datu. Malaysia's coral reefs were also affected by the 4th Global Coral Bleaching Event in 2024, which impacted coral reefs around the world. Bleaching was reported at nearly 90% of all coral reef locations surveyed in Malaysia (Reef Check Malaysia 2025). A separate study by Szereday *et al.* (2025) found that the average coral mortality in Malaysia from the 4th Global Coral Bleaching Event was 34.1%. The Terengganu archipelago was the hardest hit, with an average mortality rate of 44.2%.

Preliminary findings from Reef Check Malaysia's 2025 coral reef monitoring show a continued decline in Malaysia's coral reef health, with live coral cover dropping for the third year in a row. This steady downward trend highlights a worrying reality: current reef conservation efforts are not enough or not effective to protect Malaysia's coral reefs. Without stronger action, these coral reefs and the communities that depend on them face increasing risks.

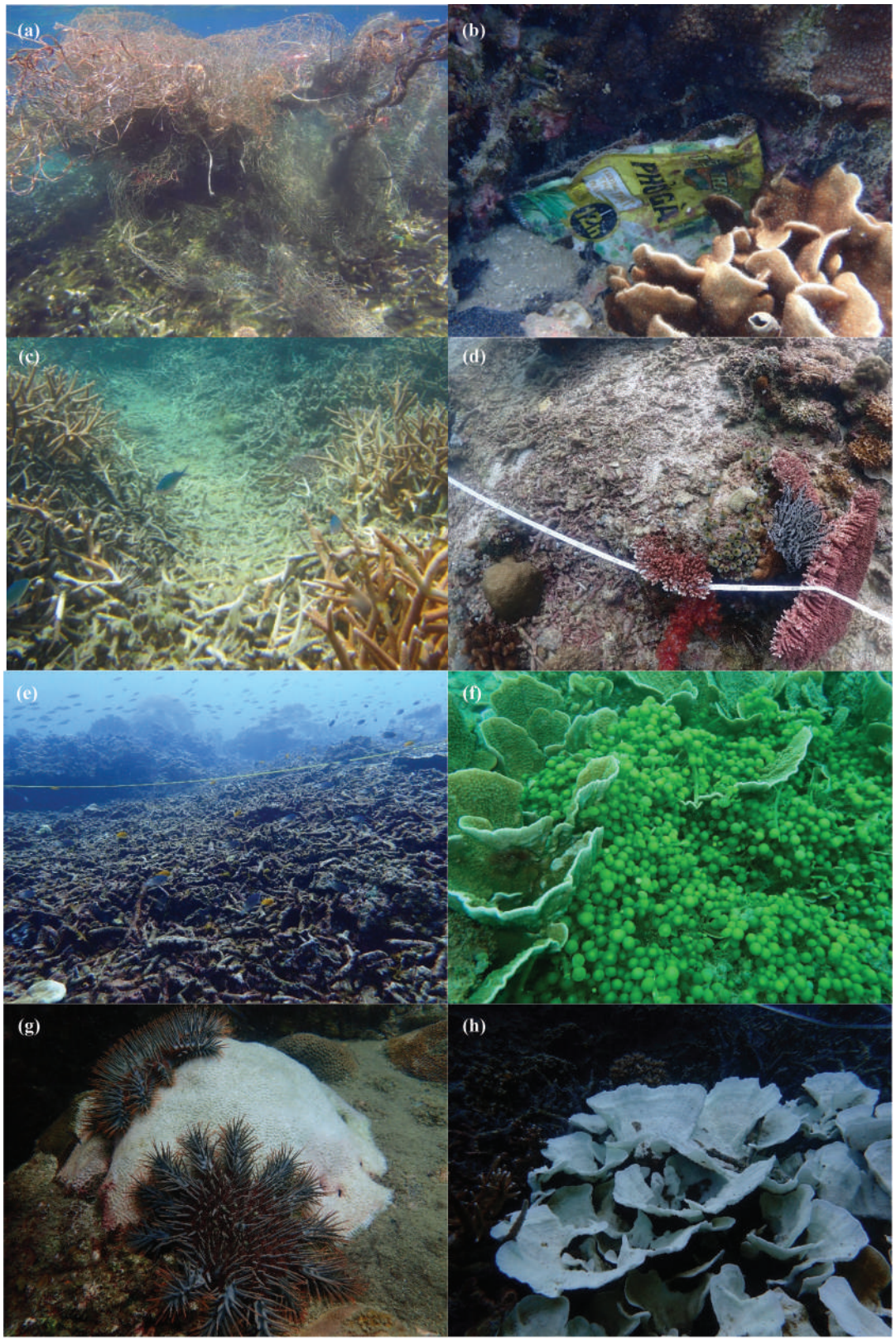

Figure 3. Threats to Malaysia's coral reefs – a) discarded fishing nets, b) marine trash, c) boat anchor damage, d) dynamite fishing, e) high level of disturbance indicators, f) high level of pollution indicators, g) crown-of-thorns starfish predation and h) coral bleaching.

CHALLENGES

Based on 18 years of data from coral reef surveys, as well as 10 years' experience working with local communities, Reef Check Malaysia has identified several key reasons why Malaysia is struggling to protect its coral reefs effectively. These problems include:

No central body to oversee and enforce marine protection efforts
Malaysia has made commitments to protecting the nation's coral reefs. The country is part of major global agreements such as the Convention on Biological Diversity and the United Nations Sustainable Development Goals. It is also a key partner in the Coral Triangle Initiative and has aligned its national policies with the Kunming-Montreal Global Biodiversity Framework through the National Policy on Biological Diversity (2022–2030). Malaysia has even pledged support for the UN Ocean Decade (2021–2030). However, despite these commitments, there is currently no single agency or national committee responsible for making sure marine policies are fully enforced and implemented across the country. This means that many good policies are not fully implemented, progress is not tracked, and no one is held accountable.

Governance issues
The lack of coordination between government agencies and other stakeholders stems from the country's institutional structure, as outlined in the Malaysian Constitution. According to Schedule 9 of the Constitution, power to make laws is divided between the Federal and State Governments. However, responsibility for environmental and biodiversity management is not clearly defined, which has led to confusion and overlapping responsibilities. The Federal Government manages Malaysia's Exclusive Economic Zone, which stretches up to 200 nm (nautical miles) from the coastline. The State Governments control land-based matters, including the seabed up to 3 nm from the low-water mark. In Peninsular Malaysia and Labuan, marine protected areas are managed by the Department of Fisheries Malaysia. In Sabah, they are overseen by Sabah Parks. In Sarawak, they fall under the Sarawak Forestry Corporation. While this governance structure allows for localised decision-making, it also makes it difficult to enforce consistent national standards. Without a cohesive and well-coordinated framework, management efforts often become fragmented, with agencies working in isolation, and missing opportunities for unified action.

Inadequate enforcement
In many marine protected areas, there are not enough resources or staff to properly enforce rules and regulations that protect marine life.

Limited involvement of local communities and stakeholders
Often, local communities and stakeholders are only given information, rather than being actively involved in making decisions. This means programmes are usually created based on assumptions about what communities need, instead of working together with them to understand their real needs. Because of this, local people often don't feel a sense of ownership or pride in these efforts, which makes it harder for management efforts to succeed in the long run. Also, the participation of local communities and stakeholders in management efforts is still limited. Coral reef management is mostly controlled from the top down by federal agencies, with little input from the people who rely on the coral reefs for their food security and livelihoods. This makes it difficult to develop management efforts that truly fit local needs and that can adapt over time.

Lack of reliable funding
There is a lack of well-planned or coordinated mechanisms to secure ongoing funding for coral reef protection, with little sign of efforts to create lasting financial support systems to keep coral reef management efforts going.

Uncoordinated research and development
Malaysia does not have a clear, coordinated plan for marine research and development. Many research groups and government agencies work separately and rarely share information or work together, which limits our understanding of the need for greater protection of coral reefs.

Lack of proper waste management systems
Many islands do not have proper systems to manage trash and sewage. In some places, these systems are completely missing, which means waste is often dumped directly or indirectly into the sea, harming coral reefs and marine life.

RECOMMENDATIONS

Coral reef conservation in Malaysia would be strengthened by the existence of a dedicated body or central coordinator whose role is to make sure policies are not only created but followed through. In Indonesia, the Ministry of Marine Affairs and Fisheries (MMAF) is the government body responsible for overseeing, formulating, and implementing marine and fisheries policies. It serves as a comprehensive institutional model that may be emulated by Malaysia in developing an effective framework for marine and fisheries governance. Malaysia government is also encouraged to take a more complete and connected approach to protecting coral reefs. This means understanding how land and sea environments are linked and managing them together. A key part of this approach should be to ensure that everyone who has a stake is engaged and able to contribute and work together. To make this happen, there should be one integrated management body with a clear role to oversee both the islands and the surrounding waters. This body would work together to make decisions in an open, fair, and coordinated way. Each member of this management body would represent a specific group or community, making sure their views are included in decision making. By giving certain responsibilities to these members, government agencies can work more closely with local communities and share everyday management tasks. This collaboration would free up government agencies to focus more on big-picture goals, like identifying and protecting new areas. Having different stakeholders involved encourages sustainable use of marine resources across the many industries on the islands. Working together, these groups can take a unified approach to managing both terrestrial and marine ecosystems. By forming strong partnerships, coral reef management can be better included in the State's overall plans for economic growth and environmental protection, ensuring efforts strike a balance between generating economic benefits and safeguarding coral reefs.

REFERENCES

Academy of Sciences Malaysia. 2022. *Position Paper on Blue Economy: Unlocking the Value of The Oceans*. Kuala Lumpur: Academy of Sciences Malaysia. pp. 210.

Asian Development Bank. 2014. *State Of the Coral Triangle: Malaysia*. pp. 126.

Carpenter, K.E., Barber, P.H., Crandall, E.D., Ablan-Lagman, M.C.A., Ambariyanto, Mahardika, G.N., Manjaji-Matsumoto, B.M. *et al*. 2011. Comparative phylogeography of the Coral Triangle and implications for marine management. *Journal of Marine Biology*: 396982. https://doi.org/10.1155/2011/396982

Chong, V.C., Lee, P.K.Y. and Lau, C.M. 2010. Diversity, extinction risk and conservation of Malaysian fishes. *Journal of Fish Biology* 76(9): 2009–2066. https://doi.org/10.1111/j.1095-8649.2010.02685.x

Chou, L.M., Wilkinson, C.R., Licuanan, W.R.Y., Alino, P., Cheshire, A.C., Loo, M.G.K., Tanjaitrong, S., Sudara, A., Ridzwan, A.R. and Soekarno, S.S. 1994. *Status of Coral Reefs in the ASEAN Region*. Proceedings of the third ASEAN-Australia symposium on living coastal resources. Queensland: Australian Institute of Marine Science.

Coral Triangle Atlas. 2025. Malaysia - Coral Triangle Atlas. Accessed on 23 September 2025. http://ctatlas.coraltriangleinitiative.org/Country/Index/MYS

Department of Statistics Malaysia. 2025. Demographic Statistics Malaysia First Quarter 2025. Accessed on 29 September 2025. https://www.dosm.gov.my/site/downloadrelease?id=demographic-statistics-first-quarter-2025&lang=English&admin_view=

Huffard, C.L., Erdmann, M.V., Gunawan, T.R.P. 2012. Geographic Priorities for Marine Biodiversity Conservation in Indonesia. Ministry of Marine Affairs and Fisheries and Marine Protected Areas Governance Program. Jakarta: Coral Triangle Initiative on Coral Reefs, Fisheries, and Food Security.

Phang, S.M., Wong, C.L., Lim, P.E., Ooi, J.L.S., Gan, S.Y., Melor, I., Yeong, H.Y. and Emienour, M.M. 2007. Seaweed Diversity in Malaysia. In *Status of Biological Diversity in Malaysia and Threat Assessment of Plant Species in Malaysia*, L.S.L Chua, L.G. Kirton and L.G. Saw (Eds.). Proceedings of the Seminar and Workshop, 28–30 June 2005. Kepong: Forest Research Institute Malaysia (FRIM).

Leong, P.K. 2025. Securing Malaysia's maritime environment using space-derived services. *Contemporary Issues in Air and Space Power* 3(1): bp42323989. https://doi.org/10.58930/bp42323989

Reef Check Malaysia. 2025. *Status of Coral Reefs in Malaysia, 2024*. Kuala Lumpur: Reef Check Malaysia.

Szereday, S., Chen, S.Y., Chew, K.L., Lee, L.K., Yusop, P.A.M., Fatta, A., Legada, C.J., Zainudin, N.B.F.B., Yaman, M.S.B. and Chelliah, A. 2025. The 4th global coral bleaching event in Malaysia: insights, outcomes, and paths forward. https://doi.org/10.5281/zenodo.15290515

Waheed, Z. 2016. Patterns of coral species richness and reef connectivity in Malaysia. PhD Dissertation. Nederland: Leiden University.

Waheed, Z. and Hoeksema, B.W. 2013. A tale of two winds: species richness patterns of reef corals around the Semporna peninsula, Malaysia. *Marine Biodiversity* 43: 37–51. https://doi.org/10.1007/s12526-012-0130-7

Yu, H.P. and Wee, H.B. 2023. A systematic review of climate change-related coral reef research trends in Malaysia. *IOP Conference Series: Earth and Environmental Science* 1167(1): 012012. https://doi.org/10.1088/1755-1315/1167/1/012012