

Collaboration Among Key Regulatory Agencies for the Sustainable Management of Belize's Coastal and Marine Resources

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Abstract

Seas and coastal areas offer communities numerous ecosystem services hence requiring open space access. Tourism, a major industry in Belize, requires healthy coastal and marine ecosystems for economic prosperity. However, marine and coastal areas face challenges due to their complexity and conflicting interests between public and private sectors, leading to biodiversity losses from unsustainable practices. To maximize the efforts of conservation organizations, there is a need to evaluate the collaboration, cooperation, and communication between key stakeholders responsible for marine conservation in Belize; hence the goal of this study. The objectives of this study included identifying the key regulatory agencies, challenges these entities face in collaboration, their legal framework, agreements/policies, and completing a key stakeholder survey. Using convenience sampling, five government agencies and four non-governmental institutions tasked with marine conservation agreed to participate. Each institution provided one representative to complete the survey using Microsoft Forms. Data from the study shows that 56% of institutions have formalized Memorandums of Understanding, (MOUs) promoting co-management and collaboration in marine reserves. However, only 33% of the surveyed institutions have established internal policies facilitating stakeholder cooperation, highlighting a significant area for improvement. Improving internal guidelines for collaboration among key stakeholders in Belize could strengthen conservation strategies, reduce costs, and ease financial constraints for regulatory agencies, helping achieve broader conservation objectives more effectively.

Keywords: Marine Conservation, coastal and marine ecosystems, stakeholder collaboration, biodiversity loss, sustainable management

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Introduction

The increasing exploitation of marine resources globally has caused fish stocks that are within biologically sustainable levels to continue to decrease, from 90% in 1974 to 66.9% in 2015 (United Nations Food and Agriculture Organization, 2018). Seas and coastal areas provide communities with numerous ecosystem goods and services, such as tourism opportunities, commercial fisheries, and socio-cultural benefits, including leisure opportunities and access to open space (Eales et al., 2021). Additionally, in many parts of the world, seafood supplies most of the protein and livelihood for large populations (Clark et al., 2000). However, many countries have experienced declining fish landings at ports over several decades (Kemp et al., 2023). This is due to improper management and protection of marine resources. Therefore, a protection mechanism must be implemented to better manage these resources. Hence, many countries have recognized the deficiencies of sectoral planning for coastal zone management and have identified the need for a national cooperative approach to achieving ecologically sustainable development (Coastal Zone Management Authority and Institute, 2014). Likewise, global advocacy highlights the importance of marine protected areas as a tool for conserving marine biodiversity, providing refuge for harvested species, and mitigating the negative impacts of human activities in marine ecosystems (Xuereb et al., 2019). Nonetheless, because protected areas may provide a refuge for predatory species, an open-minded approach to developing alternative management solutions within them is warranted (Chapman et al., 2013).

Globally, the interest in coastal and marine biodiversity conservation research has grown in the last couple of decades. Tolochko & Vadrot (2021) reported an increase in research articles from 11 in 1990 to 2581 in 2018 with the keywords “marine biodiversity”. Likewise, global awareness of our marine environment's myriad challenges is increasing, and communities are increasingly willing to act against ecological degradation (Grimsditch, 2020). However, marine and coastal conservation is challenging because of its complexity and the competing interests of the public and private sectors. For example, research in Southeast Asia concluded that the lack of quantitative comparative studies has implications for researchers planning studies in certain areas because causal effects are difficult to attribute without an appropriate comparator (Eales et al., 2021). Furthermore, local users alone can hardly manage most natural resources in the complex contemporary world and there is overwhelming evidence that centralized management of local resources is problematic (Carlsson & Berkes, 2005). Therefore, collaboration between government agencies, non-governmental organizations (NGO), and the private sector is needed to build a set of rights that will work in practice (Charles & Wilson, 2008). This partnership and collaboration will make available resources, technology, scientific expertise, research, and a diversity of information to better protect the marine environment and marine biodiversity.

Co-management is best described as aligning with evolving notions of people-centred governance, in which management responsibility is shared among partners (Berkes, 2009). As a result of interconnectivity, governments, and organizations need help in being successful in the sustainable management of natural resources alone because biodiversity has no political boundary. Therefore, as the world races to become more sustainable, participatory modelling has emerged as a tool for stakeholder involvement in scientific modelling to govern natural resources (Röckmann et al., 2012). Likewise, partnerships and collaboration have increased as these enhance the likelihood and scope of policy agreements by increasing the credibility of commitments to fulfill the agreements (Schneider et al., 2003.). Notably, in marine conservation, co-management agreements have been implemented between governments and non-governmental institutions because these collaborations increase the legitimacy and effectiveness of management decisions (De Nooy, 2013). Additionally, numerous advantages can be attributed to the formation of alliances: enhanced enforcement of marine protected areas (MPAs); more cost-effective management of MPAs; improved design of MPAs; better coordination of responses to threats to marine ecosystems; facilitation of conflict resolution; and empowerment of communities and institutions (Horigue et al., 2012). These benefits have made marine conservation and collaboration between key stakeholders attractive and effective in marine resource management.

In recent years, Belize has become an increasingly popular tourist destination due to its many attractions, such as the Belize Barrier Reef, earning the country the reputation of one of the premier sites for marine ecotourism in the world (Diedrich, 2007). As a result, tourism has become a major sector in Belize's economy, underscoring the importance of healthy coastal and marine ecosystems to Belize's economic well-being (Casey & Schuhmann, 2019). Similarly, in a nation like Belize which is becoming increasingly dependent on the health of its marine ecosystems for economic prosperity, a shift from extractive uses to

their preservation is both necessary and logical (Diedrich, 2007). Therefore, in the 1990s, the Government of Belize (GOB) initiated efforts to establish marine protected areas, adopting a multi-sectoral approach and the principles of integrated coastal zone management to account for marine and land-based activities (Cho, 2005). As a testimony to its conservation commitments, GOB passed into force the Coastal Zone Management Act in April 1998, which directed the preparation and implementation of a plan as the vehicle to effectively operationalize the concept of integrated coastal zone management in Belize (Coastal Zone Management Authority and Institute, 2016). Additionally, over the years, GOB has established partnerships with several NGOs and international financial institutions to help manage marine protected areas and finance marine conservation efforts. Notably, in 2021 GOB restructured its sovereign debt (super bond) with a face value of \$553 million through a partnership with The Nature Conservancy (TNC) and the US Development Finance Corporation (USDFC) where Belize agreed to use part of the debt relief to support marine conservation (Chamon et al., 2022). To accomplish its commitments under the agreements, GOB developed a framework that includes a wide range of stakeholders including government departments, non-governmental organizations, and other partners interested in marine conservation.

Unfortunately, there continues to be evidence of biodiversity loss; for example, the reef health index has once again dropped to 2.3 which is poor (McField et al., 2022). These losses can be attributed to threats to biodiversity and ecosystems, including unsustainable exploitation of natural resources, unsustainable tourism practices, pollution, and transboundary incursions (Belize National Biodiversity Strategy and Action Plan, 2016). To address these threats, marine conservation and research efforts in Belize have increased. Historically, much of the research published on Belize's coastal and marine resources has been led by foreign researchers, largely due to the financial constraints faced by local scientists (Young, 2008). Although this trend is gradually changing, with increasing contributions from Belizean scientists and non-governmental organizations in data collection, reporting, and scientific publication, important knowledge gaps remain. In particular, limited research has examined the extent of collaboration, coordination, and communication among the key regulatory agencies responsible for the sustainable management of Belize's coastal and marine resources. Likewise, governmental regulatory and enforcement agencies need more financial resources, personnel, and technical capacity to manage natural resources sustainably and effectively in Belize (Young, 2008). These challenges still remain in Belize (Murray, 2021; Alves, 2021). For example, in its end-of-year report, the Ministry of Blue Economy and Civil Aviation (2022) identified financial constraints as a challenge to its operations in the 2021 financial year. Achieving ecological and social conservation goals in marine conservation requires coordination and collaborative governance among multiple partners (Watson et al., 2021). Evaluating collaboration, cooperation, and communication among key regulatory agencies can provide insight into how to improve efficiency and use scarce resources more effectively in marine conservation in Belize. Consequently, this study aimed to evaluate the collaboration, cooperation, and communication between key regulatory agencies for the sustainable management of coastal and marine resources in Belize. The objectives of this study were to identify the key regulatory agencies, the challenges faced in collaboration with other agencies, the legal framework for cooperation and the conservation of marine resources, and the agreements and policies governing cooperation.

Methodology

This study employed an applied research approach to evaluate collaboration, cooperation, and communication among key regulatory agencies for the sustainable management of coastal and marine resources in Belize. Two management systems were included in the research and participants were selected using convenience sampling. Four NGOs including the Sarteneja Alliance for Conservation and Development (SACD), Belize Audubon Society (BAS), Toledo Institute for Development and Education (TIDE), and Turneffe Atoll Sustainability Association (TASA) and five government departments, including Department of the Environment (DOE), Belize Coast Guard (BCG), Belize Fisheries Department (BFiD), Forest Department (FD) and Coastal Zone Management Authority and Institute (CZMA/I) who are tasked with marine conservation, were willing to participate in the key stakeholder survey. The participants were recruited by contacting institutions through emails and phone calls asking them if they were interested in a study involving evaluating the collaboration, cooperation, and communication between key regulatory agencies for the sustainable management of coastal and marine resources in Belize. The individuals representing the institutions were senior managers such as the head of the department/organization, the deputy, or a senior manager with knowledge of the institution. The survey was conducted online.

Results

Legal framework and legal mandate

The conservation and management of Belize's coastal resources falls under various jurisdictions and government levels, both local and national. The National Biodiversity Office (NBIO) and the Forest and Fisheries Departments oversee the co-management of protected areas, which is governed by the National Protected Areas System Act (2015) and the Fisheries Resources Act (2020). Environmental protection, on the other hand, is governed by the Environmental Protection Act (2020), Pollution Regulations (2003), Environmental Protection (Effluent Limitations) Regulations (2003), and Environmental Impact Assessment Regulations (2003); under the mandate of the Department of the Environment. However, for solid waste in particular, the Solid Waste Management Authority is responsible for arranging the collection and disposal of all solid waste within a service area (Solid Waste Management Authority Act, 2000) or under any regulations made thereunder. Forest resources, including mangroves, are under the mandate of the Forest Department and are governed by the Forests Act (2020), the Forests (Protection of Mangroves) Regulations (2018), the Forest Fire Protection Act (2000), and the Private Forests (Conservation) Act (2011). The management of wildlife resources falls under the mandate of both the Forest and Fisheries Departments. The Wildlife Protection Act (2000) seeks to protect both terrestrial and aquatic species and is under the mandate of the Forest Department. The Trade in Endangered Species (CITES) Act (2023), which seeks to control the trade of endangered species, is under the mandate of both the Fisheries and Forest Departments. The management of fishery resources, both commercial and non-commercial species, and marine reserves management falls under the mandate of the BFiD under the Fisheries Resources Act (2020) and fisheries regulations. The BCG enforces marine resource protection regulations under the Coast Guard Act (2020). The CZMA/I recommends policies for the coastal zone under the Coastal Zone Management Act (2020). While all the 9 organizations interviewed carried out their mandate, 67% did not have internal policies to guide their cooperation, collaboration, and communication with partner institutions and stakeholders while 33% had such policies.

Cooperation among organizations.

Belize's marine and environmental conservation efforts are supported by a network of organizations and government agencies that collaborate extensively to protect the country's biodiversity and natural resources. SADC, BAS, TIDE, TASA, DOE, BFiD, BCG, and CZMA/I frequently partner with each other and with various government departments such as the FD, BFiD, NBIO, Lands Department, Ministry of Blue Economy and Marine Conservation (MBEMC), Ministry of Economic Development (MED), and Belize Port Authority (BPA). These organizations also engage with international and local environmental groups, including the Belize Marine Protected Area Network (BMPAN), Wildlife Conservation Society (WCS), World Wildlife Fund (WWF), The Nature Conservancy (TNC), Southern Environmental Association (SEA), Blue Ventures (BV), MAR Alliance, Wildtracks, Crocodile Research Coalition (CRC), Bonefish and Tarpon Trust (BFTT), Rainforest Environmental Conservation Organization (RECO), and various fisher cooperatives. Additionally, they work alongside the Belize Police Department (BPD), Belize Defence Force (BDF), Customs and Excise Department (CED), Belize Agriculture Health Authority (BAHA), Protected Areas Conservation Trust (PACT), Belize Tourism Board (BTB), Caribbean Community Climate Change Center (CCCCC), Belize Blue Bond Unit (BBBU), and the University of Belize (UB) to promote environmental protection, sustainable development, and marine conservation across Belize.

Memorandums of Understanding by organizations.

The SADC has signed MOUs with the NBIO for co-management agreements involving the Corozal Bay Wildlife Sanctuary (CBWS) in 2023 (Government of Belize Press Office, 2023) and Bacalar Chico National Park (BCNP) in 2024 (SADC, 2024), as well as with BV for Lionfish management in Bacalar Chico Marine Reserve (BCMR) in 2025 (Blue Ventures, 2025). TIDE holds MOUs and collaborative and strategic partnerships with various organizations, including the BFiD, NBIO, MBECA in 2023 (Government of Belize Press Office, 2023), BMPAN, SEA, TASA, BAS, and SADC. The DOE has collaborative partnerships with the BDF and BFiD. The BFiD has agreements with the WCS, WWF, TNC, TIDE, TASA, SEA, and Environmental Conservation Organization Marine (ECOMAR). Lastly, the FD has a collaborative partnership with the Caye Caulker Group for Environmental Sustainability (CCGES).

Challenges faced by regulatory agencies.

Key regulatory agencies responsible for sustainable marine resource management face many challenges, each of which impacts their ability to collaborate effectively. Primarily, these agencies encounter limitations in both human and financial resources, which restrict their capacity to administer and implement joint projects. Another challenge is that overlapping responsibilities and functions within and between organizations often result in duplication of efforts and confusion regarding mandates (Jones, 2025). For instance, Jones (2025) highlighted the actors with overlapping responsibilities in the marine sector. Examples include coastal and mangrove Governance where institutional mandates governing coastal development and mangrove conservation overlap among multiple agencies. The Belize Tourism Board (BTB) promotes tourism infrastructure and beachfront development, while the FD and the CZMAI are responsible for the protection and sustainable management of mangrove ecosystems. The absence of clearly delineated regulatory responsibilities can result in conflicting development objectives, inconsistencies in permitting processes, and challenges in enforcement. In protected areas governance: The governance of Belize's protected areas is characterized by a multi-agency institutional framework involving the National Protected Areas Secretariat, the Fisheries Department, the Forest Department, and co-managing non-governmental organizations, including the Belize Audubon Society. Overlapping statutory responsibilities and jurisdictional boundaries may create administrative complexities, particularly with respect to visitor fee administration, regulatory enforcement, and management authority. In Environmental Impact Assessment (EIA) Governance, Environmental Impact Assessments are coordinated by the DOE through the National Environmental Appraisal Committee (NEAC). However, the sequencing of sectoral approvals is not always harmonized across government agencies. In some instances, land allocations, leases, or tourism concessions administered by line ministries may proceed concurrently with, or prior to, the completion of the environmental review process, creating institutional inconsistencies, regulatory uncertainty, and potential legal challenges. In Cruise Tourism Governance, strategic planning and regulation of the cruise tourism sector involve multiple institutions, including the Ministry of Tourism and Diaspora Relations, local government authorities, and the BPA. The absence of an integrated governance framework may contribute to overlapping planning responsibilities, duplication of strategic initiatives, and inconsistencies in decision-making related to port infrastructure development, passenger capacity management, and associated transportation systems.

Moreover, disparities in resource allocation among government agencies compound these challenges, as entities with higher allocations are expected to carry out their full mandates due to these perceived advantages. In sooth, all agencies are expected to carry out their mandate and these perceived advantages can lead to delays and unmet expectations. Additionally, the unavailability of human resources such as officers or backing out of commitments disrupts planned activities, underscoring the importance of reliable partnerships. Given the diverse ecosystems they manage, agencies often rely on local knowledge for less-travelled areas, necessitating robust cooperation and information-sharing networks. Meanwhile, ensuring the safety of officers traversing seas remains a paramount concern, requiring meticulous planning and resource allocation. Differences in management approaches and policies among agencies present additional hurdles, fostering competition for resources and undermining alignment efforts. Overcoming these challenges demands a concerted effort to enhance collaboration, communication, and resource allocation strategies, ultimately enabling agencies to achieve their shared goal of sustainable marine resource management more effectively.

Discussion

Cooperation, collaboration, and communication among key regulatory agencies responsible for marine conservation in Belize are essential for effectively managing marine resources, marine reserves, and marine protected areas. Belize's National Environmental Action Plan (2022-2026) calls for the strengthening of policy cohesion within the sustainable management of coastal and marine resources in Belize through improved collaboration and communication between key regulatory agencies. Likewise, the Belize Integrated Coastal Zone Management Plan (2016) calls for integrated management approaches with an emphasis on collaboration among key regulatory agencies and stakeholders to address coastal issues effectively. The National Biodiversity Strategy and Action Plan (2016) also considered cooperation and collaboration among various governmental agencies, NGOs, and stakeholders to achieve biodiversity

conservation goals, with an emphasis on the need for coordinated efforts in marine protected area management and enforcement.

These policies and strategies seek to improve collaboration between key stakeholders in Belize to increase efficiency in managing marine resources. Governmental agencies and NGOs have been given legal mandates and the authority to improve marine resource protection. These agencies increased their collaborative efforts to achieve conservation goals and stakeholders involving governmental agencies such as the Fisheries Department, Forest Department, and Belize Coast Guard, along with NGOs like the Belize Audubon Society and the Toledo Institute for Development and Environment participate in collaborative efforts. This collaborative network spans across multiple sectors, including research, enforcement, and community engagement, reflecting a unified approach to marine conservation efforts in Belize. Most institutions (56%) have advanced in their collaborative efforts and formalized partnerships through MOUs. These MOUs encompass agreements for co-management, research, and collaboration on specific marine reserves, demonstrating a concerted effort among governmental agencies, NGOs, and other stakeholders to address marine conservation challenges collectively.

Nonetheless, more can be done to improve efficiency in collaboration, cooperation, and communication between regulatory agencies. For instance, of the nine institutions that participated in the survey, only 33% have an internal policy that guides them to collaborate and cooperate with other stakeholders. The majority (67%) lacked an internal policy. It is increasingly acknowledged and agreed that collaborative conservation actions can lead to improved efficiency and economic savings (Rodrigues and Gaston 2002). This can be beneficial for Belize as one of the major challenges faced by these regulatory agencies is financial constraints which hinder their ability to fulfill their legal mandates effectively. By collaborating and cooperating with other agencies responsible for marine conservation, costs can be minimized, and resources can be shared to enhance conservation efforts efficiently and effectively.

Conclusion / Recommendations

The institutional model of coastal and marine conservation in Belize includes organizations operating under various legal frameworks and mandates. While progress has been made in fostering collaboration and cooperation in coastal marine conservation efforts in Belize, including the National Enforcement and Conservation Monitoring Strategy and Action Plan to safeguard its ocean future under the Blue Bond program (Government of Belize Press Office, 2025), there is still much work to be done. Despite this, cooperation among institutions is evident, facilitated through formalized MOUs and collaborative efforts in co-managing marine reserves and enforcing regulations. However, key challenges persist, including resource limitations, overlapping responsibilities, and disparities in resource allocation, hindering effective collaboration. Addressing these challenges is crucial for enhancing coordination and achieving sustainable marine resource management goals. For this, it is recommended that organizations develop internal policies that provide clear direction and guidelines on how to collaborate, cooperate and communicate with other conservation organizations. This will facilitate the establishment of formal and regular communication channels among partners to ensure all parties are informed, aligned, and able to provide input on ongoing projects and strategies. Mediums such as joint online and face-to-face training sessions and workshops, for staff from different organizations to foster a shared understanding of conservation goals, techniques, and challenges can be used to strengthen this effort. Likewise, these platforms can be used to share information, learn from each other's successes and failures, and adjust strategies in real-time to improve conservation outcomes. Improved collaboration, cooperation and communication can lead to policy harmonization to reduce conflict and create a supportive regulatory environment that considers the contributions and needs of all stakeholders.

References

- Alves, C. (2021). Marine resource management and fisheries governance in Belize exhibit a polycentric, decentralized, and nested institutional structure. *Ocean & Coastal Management*, 211, Article 105742. <https://doi.org/10.1016/j.ocecoaman.2021.105742>
- Belize National Biodiversity Strategy and Action Plan. (2016). *Belize national biodiversity strategy and action plan*. Ministry of Agriculture, Forestry, Fisheries, the Environment and Sustainable Development.
- Berkes, F. (2009). Evolution of co-management: Role of knowledge generation, bridging organizations and social learning. *Journal of Environmental Management*, 90(5), 1692–1702. <https://doi.org/10.1016/j.jenvman.2008.12.001>
- Blue Ventures. (2025). *Our partners: Sarteneja Alliance for Conservation and Development*. <https://blueventures.org/partner/sarteneja-alliance-conservation-development/>
- Carlsson, L., & Berkes, F. (2005). Co-management: Concepts and methodological implications. *Journal of Environmental Management*, 75(1), 65–76. <https://doi.org/10.1016/j.jenvman.2004.11.008>
- Casey, J. F., & Schuhmann, P. W. (2019). PACT or no PACT are tourists willing to contribute to the Protected Areas Conservation Trust in order to enhance marine resource conservation in Belize? *Marine Policy*, 101, 8–14. <https://doi.org/10.1016/j.marpol.2018.12.002>
- Chamon, M. D., Klok, E., Thakoor, V. V., & Zettelmeyer, J. (2022). *Debt-for-climate swaps: Analysis, design, and implementation* (IMF Working Paper No. 2022/162). International Monetary Fund.

- Chapman, J., Gough, C., Hudson, J., Humber, F., & Harris, A. (2013). All boom and no bust as the lionfish invasion progresses in Bacalar Chico Marine Reserve, Belize. *Proceedings of the Gulf and Caribbean Fisheries Institute 66th Annual Conference*, 4–8.
- Charles, A., & Wilson, L. (2008). Human dimensions of marine protected areas. *ICES Journal of Marine Science*, 66(1), 6–15. <https://doi.org/10.1093/icesjms/fsn182>
- Cho, L. (2005). Marine protected areas: A tool for integrated coastal management in Belize. *Ocean & Coastal Management*, 48(11–12), 932–947.
<https://doi.org/10.1016/j.ocecoaman.2005.10.001>
- Clark, J., Salm, R., & Siirila, E. (2000). *Marine and coastal protected areas: A guide for planners and managers* (3rd ed.). IUCN. <https://doi.org/10.1604/9782831705408>
- Coast Guard Act, Cap. 131-01, Rev. Ed. (2020).
- Coastal Zone Management Act, Rev. Ed. (2020).
- Coastal Zone Management Authority & Institute. (2014). *State of the Belize coastal zone report 2003–2013*. CZMAI.
- Coastal Zone Management Authority and Institute. (2016). *Belize integrated coastal zone management plan*. CZMAI.
- De Nooy, W. (2013). Communication in natural resource management: Agreement between and disagreement within stakeholder groups. *Ecology and Society*, 18(2), Article 44.
- Diedrich, A. (2007). The impacts of tourism on coral reef conservation awareness and support in coastal communities in Belize. *Coral Reefs*, 26(4), 985–996.
<https://doi.org/10.1007/s00338-007-0224-z>

Eales, J., Bethel, A., Fullam, J., Olmesdahl, S., Wulandari, P., & Garside, R. (2021). What is the evidence documenting the effects of marine or coastal nature conservation or natural resource management activities on human well-being in South East Asia? A systematic map. *Environment International*, 151, Article 106397.

<https://doi.org/10.1016/j.envint.2021.106397>

Environmental Impact Assessment Regulations, Subsidiary Laws of Belize (2003).

Environmental Protection Act, Cap. 328, Rev. Ed. (2020).

Environmental Protection (Effluent Limitations) Regulations, Subsidiary Laws of Belize (2003).

Fisheries Resources Act, No. 7, Laws of Belize (2020).

Forest Fire Protection Act, Rev. Ed. (2000).

Forests Act, Cap. 213, Laws of Belize (2020).

Forests (Protection of Mangroves) Regulations, Subsidiary Laws of Belize (2018).

Food and Agriculture Organization of the United Nations. (2018). *The state of world fisheries and aquaculture: Meeting the sustainable development goals*. FAO.

Government of Belize Press Office. (2023, May 15). *GOB continues signing of protected areas co-management agreements with conservation partners*.

<https://www.pressoffice.gov.bz/gob-continues-signing-of-protected-areas-co-management-agreements-with-conservation-partners/>

Government of Belize Press Office. (2025). *Belize advances national enforcement and conservation monitoring strategy and action plan to safeguard its ocean future under the Blue Bond program*. <https://www.pressoffice.gov.bz/belize-advances-national->

enforcement-and-conservation-monitoring-strategy-and-action-plan-to-safeguard-its-ocean-future-under-the-blue-bond-program/

- Grimsditch, G. (2020). The UN decade on ecosystem restoration. *The Magazine of the Marine Biological Community*, 14, 15.
- Hinds, K. K. (2025). *Between the land and the sea: Belizean voices in environmental governance* [Doctoral dissertation, University of South Florida]. USF Tampa Graduate Theses and Dissertations.
- Horigue, V., Aliño, P. M., White, A. T., & Pressey, R. L. (2012). Marine protected area networks in the Philippines: Trends and challenges for establishment and governance. *Ocean & Coastal Management*, 64, 15–26. <https://doi.org/10.1016/j.ocecoaman.2012.04.012>
- Jones, L. (2025). *Maritime sector baseline assessment report: A Belizean perspective*. Belize City.
- Kemp, P., Subbiah, G., Barnes, R., Boerder, K., O’Leary, B., Stewart, B., & Williams, C. (2023). The future of marine fisheries management and conservation in the United Kingdom: Lessons learnt from over 100 years of biased policy. *Marine Policy*, 147, Article 105075. <https://doi.org/10.1016/j.marpol.2022.105075>
- McField, M., Soto, M., Craig, N., Giro, A., Drysdale, I., Guerrero, C., Rueda, M., Kramer, P., Canty, S., & Muñiz, I. (2022). *2022 Mesoamerican reef report card*. Healthy Reefs Initiative. <http://www.healthyreefs.org>
- Ministry of Blue Economy and Civil Aviation. (2022). *Annual report 2021*. Ministry of Blue Economy and Civil Aviation.

Murray, R. (2021). A governance analysis of three MPAs in Belize: Conservation objectives compromised by tourism development priorities? *Marine Policy*, 127, Article 104243.

<https://doi.org/10.1016/j.marpol.2020.104243>

National Protected Areas System Act, Laws of Belize (2025).

Pollution Regulations, Environmental Protection, Subsidiary Laws of Belize (2003).

Private Forests (Conservation) Act, Cap. 217, Rev. Ed. (2011).

Röckmann, C., Ulrich, C., Dreyer, M., Bell, E., Borodzicz, E., Haapasaari, P., Hauge, K. H.,

Howell, D., Mäntyniemi, S., Miller, D., Tserpes, G., & Pastoors, M. (2012). The added value of participatory modelling in fisheries management – What has been learnt? *Marine Policy*, 36(5), 1072–1085. <https://doi.org/10.1016/j.marpol.2012.02.027>

Rodrigues, A. S., & Gaston, K. J. (2002). Rarity and conservation planning across geopolitical units. *Conservation Biology*, 16(3), 674–682. <https://doi.org/10.1046/j.1523-1739.2002.00388.x>

Sarteneja Alliance for Conservation and Development. (2024). *Bacalar Chico co-management agreement*. <https://sacdbelize.org/bacalar-chico-co-management-agreement/>

Schneider, M., Scholz, J., Lubell, M., Mindruta, D., & Edwardsen, M. (2003). Building consensual institutions: Networks and the National Estuary Program. *American Journal of Political Science*, 47(1), 143–158. <https://doi.org/10.1111/1540-5907.00010>

Solid Waste Management Authority Act, Cap. 224, Rev. Ed. (2000).

Tolochko, P., & Vadrot, A. B. (2021). The usual suspects? Distribution of collaboration capital in marine biodiversity research. *Marine Policy*, 124, Article 104318.

<https://doi.org/10.1016/j.marpol.2020.104318>

Watson, M. S., Jackson, A. M., Lloyd-Smith, G., & Hepburn, C. D. (2021). Comparing the marine protected area network planning process in British Columbia, Canada and New Zealand – Planning for cooperative partnerships with indigenous communities. *Marine Policy*, 125, Article 104386. <https://doi.org/10.1016/j.marpol.2020.104386>

Xuereb, A., D'Aloia, C., Daigle, R., Andrello, M., Dalongeville, A., Manel, S., Mouillot, D., Guichard, F., Côté, I., Curtis, J., Bernatchez, L., & Fortin, M. (2019). Marine conservation and marine protected areas. In *Population Genomics* (pp. 423–446). Springer. https://doi.org/10.1007/13836_2018_63

Young, C. A. (2008). Belize's ecosystems: Threats and challenges to conservation in Belize. *Tropical Conservation Science*, 1(1), 18–33.

<https://doi.org/10.1177/194008290800100102>