

MARINE RESOURCE GOVERNANCE: A SYSTEMATIC LITERATURE REVIEW OF POLICY TRENDS AND COLLABORATIVE MANAGEMENT APPROACHES

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Abstract

This study aimed to analyze the development of marine resource governance research through a Systematic Literature Review (SLR) based on bibliometric analysis. The study examined publication trends, major contributors, geographical distribution, and the intellectual structure of the field. Data were collected from the Scopus database using keywords related to marine resource governance and ocean governance. An initial search identified 1,266 documents, which were filtered to 473 articles published between 2016 and 2023. Data analysis employed Scopus Analyze Search Results and VOSviewer through co-occurrence, overlay, and density visualizations. The findings indicate a significant increase in publication output and reveal that marine resource governance has become an increasingly interdisciplinary field dominated by Environmental Science and Social Sciences. The United States, Australia, and the United Kingdom emerged as the leading contributors. Research themes have shifted toward climate change, biodiversity conservation, blue economy, and collaborative governance approaches, highlighting the growing importance of adaptive and participatory ocean governance.

Keywords: collaborative governance; marine governance; ocean governance; policy; sustainability

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INTRODUCTION

Marine resources constitute one of the most valuable assets supporting ecological sustainability, economic development, food security, and human well-being. However, increasing pressures from overexploitation, marine pollution, biodiversity loss, and climate change have intensified the complexity of managing marine ecosystems, making marine resource governance an increasingly important issue in achieving sustainable development (Giannopoulos, 2019; Kelly et al., 2019; Greenhill et al., 2020). Consequently, governments, international organizations, and scientific communities have devoted greater attention to developing governance mechanisms capable of ensuring the long-term sustainability and resilience of marine socioecological systems (Dalton et al., 2020; Fanning et al., 2021).

Marine resource governance extends beyond conventional resource management by emphasizing the institutions, policies, and interactions among stakeholders involved in the use and conservation of marine resources. Recent developments indicate a shift from fragmented and sectoral approaches toward integrated and adaptive governance systems that acknowledge the interconnectedness of environmental, social, and economic dimensions (Rochette et al., 2015; Mahon & Fanning, 2019; Gjerde & Yadav, 2021). Such transformation reflects the recognition that contemporary marine challenges require coordination among multiple actors and governance levels to balance

conservation objectives with economic development (Giannopoulos, 2019; Fanning et al., 2021).

The growing importance of marine governance has been reinforced by global agendas such as the Sustainable Development Goals and the increasing prominence of concepts such as ecosystem-based management, marine spatial planning, and the blue economy. Simultaneously, climate change, ocean acidification, and marine biodiversity degradation have created new challenges that require more adaptive and collaborative governance arrangements (Keen et al., 2018; Greenhill et al., 2020; Enright et al., 2021). These developments have stimulated increasing scholarly interest in understanding how governance systems can support sustainable ocean management while responding to complex environmental and socioeconomic changes (Das et al., 2024; Sun, 2025).

Previous studies have examined various dimensions of marine resource governance, including legal frameworks, institutional arrangements, marine biodiversity conservation, and ecosystem-based management. Research has highlighted the importance of regional cooperation, integrated coastal management, and governance mechanisms in improving the effectiveness of marine conservation and resource utilization (Kelly et al., 2019; Enright et al., 2021; Franco et al., 2025). In addition, studies have emphasized the importance of science-policy interactions and institutional innovation in addressing increasingly complex marine governance challenges (Weiland et al., 2021; McAteer & Flannery, 2025).

Alongside institutional and regulatory issues, collaborative management approaches have become one of the most prominent themes in contemporary marine governance research. Concepts such as co-management, adaptive governance, polycentric governance, and knowledge co-production have increasingly emerged as mechanisms for dealing with uncertainty and complexity in marine socioecological systems (Greenhill et al., 2020; Gjerde & Yadav, 2021). Furthermore, stakeholder participation, indigenous knowledge, community engagement, and science-policy interfaces are increasingly recognized as essential components of effective governance systems (Parsons et al., 2021; Weiland et al., 2021; O'Connor et al., 2024). Consequently, marine governance has gradually shifted from state-centered approaches toward more participatory and collaborative frameworks (Dalton et al., 2020; McAteer & Flannery, 2025).

The rapid growth of scientific publications on marine governance reflects the increasing recognition of the strategic role of oceans in sustainable development. Recent studies have expanded their focus toward issues such as blue economy governance, digital infrastructures, autonomous observation technologies, and inclusive governance frameworks for vulnerable coastal communities (Das et al., 2024; Pastra et al., 2025; Sun, 2025). These developments demonstrate that marine governance has become an increasingly interdisciplinary field characterized by interactions among ecological, institutional, technological, social, and economic dimensions (Fanning et al., 2021; Franco et al., 2025).

Despite the growing body of literature, previous studies have generally focused on specific issues and geographical contexts, resulting in fragmented understandings of the broader evolution of marine resource governance research. Existing reviews have predominantly examined particular themes, such as marine protected areas, fisheries governance, ecosystem-based management, or regional cooperation, with limited attention devoted to mapping the overall intellectual structure and emerging trends within the field (Rochette et al., 2015; Enright et al., 2021; Franco et al., 2025). Consequently,



information regarding publication trends, major contributors, and the evolution of collaborative management approaches remains relatively scattered.

Bibliometric analysis provides a comprehensive approach for examining the development of scientific knowledge by identifying publication characteristics, major contributors, and thematic relationships within a research field. Moreover, visualization tools such as VOSviewer facilitate the exploration of intellectual structures, thematic clusters, and emerging topics through keyword co-occurrence analysis (Van Eck & Waltman, 2010; Donthu et al., 2021). Therefore, combining a Systematic Literature Review with bibliometric analysis offers a valuable framework for understanding the evolution and future directions of marine resource governance research (Kitchenham & Charters, 2007; Donthu et al., 2021).

Accordingly, this study aims to analyze the development of marine resource governance research through a Systematic Literature Review based on bibliometric analysis. Specifically, the study seeks to identify publication trends and bibliometric characteristics, examine major contributors and geographical distributions, and explore the main themes, emerging issues, and collaborative management approaches underlying the intellectual structure of the field. By providing a comprehensive overview of the evolution of marine governance research, this study contributes to a deeper understanding of policy trends and collaborative governance approaches that can support sustainable ocean management and the achievement of global sustainability goals.

METHOD

This study employed a Systematic Literature Review (SLR) approach based on bibliometric analysis to map the development of research on marine resource governance. This approach enables the systematic and measurable identification of publication trends, research characteristics, and the intellectual structure of the field (Kitchenham & Charters, 2007; Donthu et al., 2021). Research data were obtained from the Scopus database using the search query: TITLE-ABS-KEY(("marine resource governance" OR "marine governance" OR "ocean governance")). The search was limited to publications between 2016 and 2023 and initially yielded 1,266 documents. Subsequently, a filtering process was conducted based on document eligibility and relevant subject areas to ensure the relevance and quality of the dataset. After the screening process, 473 documents were retained and used as the data sources for further analysis.

Data analysis was conducted descriptively using the Analyze Search Results feature in Scopus and VOSviewer software. Scopus analysis was employed to identify publication characteristics based on year of publication, source title, document type, author, affiliation, country or territory, and subject area. Furthermore, VOSviewer was used to visualize the intellectual structure of the field through co-occurrence analysis, overlay visualization, and density visualization to identify keyword relationships, thematic clusters, and emerging topics related to marine resource governance and collaborative management approaches (Van Eck & Waltman, 2010; Donthu et al., 2021). The results of the analysis were subsequently presented in the form of tables, graphs, and visualization maps and interpreted descriptively to provide insights into publication trends, major contributors, thematic developments, and future research directions in marine resource governance.



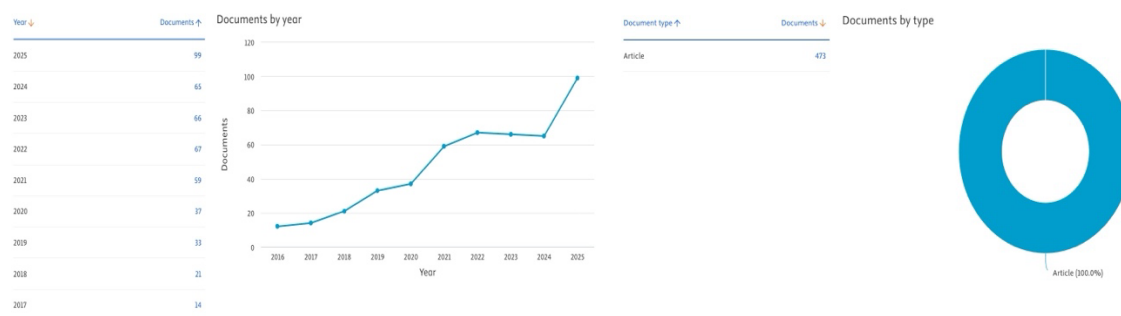
RESULT AND DISCUSSION

To answer the first research question concerning the publication trends and bibliometric characteristics of studies on digital ethics among vocational high school students, an analysis was conducted using the Analyze Search Results feature in the Scopus database. This analysis aims to provide an overview of the development and characteristics of publications in this field during the 2019–2025 period. Bibliometric analysis enables the identification of publication growth patterns and provides information regarding document types, publication sources, and subject areas that have contributed to the development of research on digital ethics and educational practices in vocational education. Accordingly, the bibliometric characteristics of the selected studies were examined through four indicators, namely documents by year, documents by type, documents by source, and documents by subject area. The results of these analyses are presented in the following figures.

What are the publication trends and bibliometric characteristics of research on marine resource governance??

Figure 1.

Documents by Year and by Type



Source: Scopus database, 2026

Figure 1 illustrates the publication trends and document types of studies on marine resource governance based on the articles analyzed during the 2019–2025 period. Overall, the number of publications demonstrates a generally increasing trend, although some fluctuations are evident across the years. Research output remained relatively limited during the early period, but the number of publications increased considerably after 2020 and reached its highest level in 2025. In addition, the analysis of document types indicates that all publications included in this study were journal articles (100%), suggesting that research on marine resource governance has predominantly been disseminated through peer-reviewed journals. This finding reflects the growing maturity of the field and indicates that scholarly discussions on marine governance are supported by rigorous empirical and conceptual investigations.

The upward trend in publications reflects increasing global attention to the governance challenges associated with marine resources, particularly in response to climate change, biodiversity loss, transboundary marine issues, and the implementation of Sustainable Development Goal 14 (SDG 14). Earlier studies mainly emphasized integrated marine management and the institutional barriers hindering governance transformation. For example, Kelly et al. (2019) argued that persistent institutional



problems and path dependency often constrain the implementation of integrated coastal and marine management approaches. Likewise, Giannopoulos (2019) highlighted the importance of strengthening international legal standards and enhancing synergies among environmental instruments to address governance gaps in marine resource management. During the same period, increasing concern regarding climate-related pressures led researchers to advocate adaptive governance mechanisms capable of responding to uncertainty and ecological change. Greenhill et al. (2020) demonstrated that adaptive and collaborative governance arrangements are essential for enhancing the resilience of marine ecosystems and supporting sustainable responses to ocean acidification.

As research expanded, scholarly attention shifted toward collaborative and multi-level governance approaches. Dalton et al. (2020) emphasized the importance of marine-related learning networks in facilitating knowledge exchange, building institutional capacity, and supporting policy innovation in ocean governance. Similarly, Weiland et al. (2021) showed that stakeholder dialogue processes and science-policy interfaces play a critical role in strengthening cooperation among diverse actors and promoting transformative ocean governance. At the regional level, Fanning et al. (2021) reported that effective management of shared marine resources requires coordinated governance mechanisms, capacity building, and strong political leadership. Enright et al. (2021) further demonstrated how regional cooperation frameworks can contribute to the conservation and sustainable use of marine biodiversity despite challenges associated with fragmented governance systems. These studies collectively indicate that marine governance research has gradually evolved from institution-centered perspectives toward more collaborative, participatory, and ecosystem-based approaches.

More recent publications reveal a growing emphasis on inclusiveness, equity, and technological innovation in marine governance. O'Connor et al. (2024) highlighted the importance of participatory science and community engagement in marine protected areas, arguing that equitable power-sharing mechanisms are necessary to strengthen local participation and improve governance outcomes. Meanwhile, McAteer and Flannery (2025) critically examined the role of community science in marine governance and demonstrated how power relations influence knowledge production and policy processes. Contemporary studies have also increasingly focused on ecosystem-based management and decision-support tools to enhance governance effectiveness. Franco et al. (2025) emphasized that ecosystem-based management requires flexible and context-specific assessment tools to support sustainable marine resource management. Furthermore, Pastra et al. (2025) illustrated how emerging technologies and autonomous observation systems present new legal and policy challenges that necessitate coordinated multi-stakeholder governance arrangements. In addition, Sun (2025) highlighted the importance of regional cooperation, adaptive capacity, and inclusive governance frameworks in ensuring sustainable marine resource governance, particularly for small island developing states.

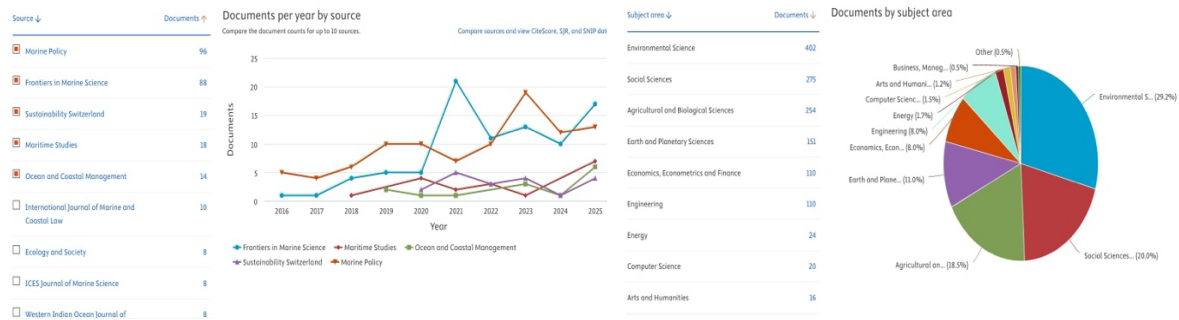
The dominance of journal articles further indicates that research on marine resource governance is characterized by evidence-based inquiry and strong scientific foundations. Across the reviewed studies, a common theme is the increasing recognition that sustainable marine resource governance cannot rely solely on traditional top-down management but instead requires collaborative, adaptive, and participatory approaches involving governments, communities, scientific institutions, and international organizations. Consequently, the increasing publication trend and the predominance of



journal articles suggest that marine resource governance has emerged as a dynamic and rapidly developing field of research. This growth is expected to continue as global concerns regarding biodiversity conservation, climate change adaptation, blue economy development, and ecosystem resilience become increasingly central to international policy agendas and sustainable ocean governance initiatives.

Figure 2.

Documents per Year by Source and by subject area



Source: Scopus database, 2026

Figure 2 presents the distribution of publications by source titles and subject areas of studies on marine resource governance during the 2019–2025 period. The analysis reveals that research on marine resource governance has been disseminated across various scientific journals, indicating the multidisciplinary nature of the field. Among the publication sources, Marine Policy contributed the highest number of articles, followed by Frontiers in Marine Science, Ocean and Coastal Management, Marine Pollution Bulletin, and several other journals. Furthermore, the subject area analysis demonstrates that Environmental Science constituted the largest proportion of publications, followed by Social Sciences and Agricultural and Biological Sciences. Smaller contributions originated from Earth and Planetary Sciences, Energy, Economics, Engineering, and Decision Sciences. This distribution highlights that marine resource governance is not only an environmental issue but also encompasses social, economic, technological, and policy dimensions.

The dominance of Marine Policy and Frontiers in Marine Science indicates that scholarly discussions on marine resource governance are strongly connected to policy development and ecosystem sustainability. Previous studies published in these journals have emphasized the importance of integrated governance frameworks and adaptive approaches in addressing increasingly complex marine challenges. Kelly et al. (2019) argued that institutional inertia and policy fragmentation often impede the implementation of integrated marine management, while Greenhill et al. (2020) highlighted adaptive governance as a mechanism for dealing with uncertainty arising from climate change and ocean acidification. Likewise, Dalton et al. (2020) demonstrated that marine learning networks contribute significantly to knowledge exchange and capacity building, thereby strengthening collaborative governance processes.

The substantial contribution of Environmental Science reflects the growing concern regarding biodiversity conservation, ecosystem resilience, and sustainable utilization of



marine resources. Studies by Fanning et al. (2021) and Weiland et al. (2021) emphasized that ecosystem-based management and multi-stakeholder collaboration are essential for maintaining marine ecosystem sustainability and achieving Sustainable Development Goal 14 (SDG 14). Similarly, Franco et al. (2025) highlighted the importance of ecosystem-based management tools in supporting effective decision-making processes and improving governance outcomes. These findings suggest that environmental sustainability remains the central theme within marine resource governance research.

The considerable representation of Social Sciences demonstrates that governance issues increasingly extend beyond ecological concerns toward institutional arrangements, stakeholder participation, and social equity. O'Connor et al. (2024) showed that meaningful community participation and participatory science approaches are crucial for improving the effectiveness of marine protected areas. Likewise, McAteer and Flannery (2025) argued that power relations and governance structures significantly influence the capacity of community science initiatives to generate transformative change. These studies indicate that social dimensions, including inclusiveness, trust building, and collaborative processes, have become integral components of marine governance research.

Meanwhile, the presence of Agricultural and Biological Sciences and Earth and Planetary Sciences reflects the interdisciplinary character of marine resource governance. Biological and ecological perspectives are essential for understanding ecosystem functioning and marine biodiversity, whereas Earth and Planetary Sciences provide insights into climate variability, oceanographic processes, and environmental changes that affect marine resources. In addition, the contribution of Economics, Energy, Engineering, and Decision Sciences indicates increasing scholarly interest in blue economy development, technological innovation, renewable energy, and evidence-based policy formulation. Recent studies by Pastra et al. (2025) and Sun (2025) demonstrate how emerging technologies, digital observation systems, and international cooperation frameworks are becoming increasingly important for supporting sustainable and adaptive governance systems.

Overall, the distribution of publications across source titles and subject areas suggests that marine resource governance has evolved into a highly interdisciplinary research domain. Initially dominated by environmental and ecological perspectives, the field has progressively incorporated social, institutional, economic, and technological dimensions. The predominance of journals such as *Marine Policy* and *Frontiers in Marine Science*, together with the strong representation of *Environmental Science and Social Sciences*, indicates that future research is likely to focus increasingly on integrated governance frameworks, ecosystem resilience, stakeholder engagement, and innovative approaches that support sustainable ocean development in the context of the blue economy and global environmental change.

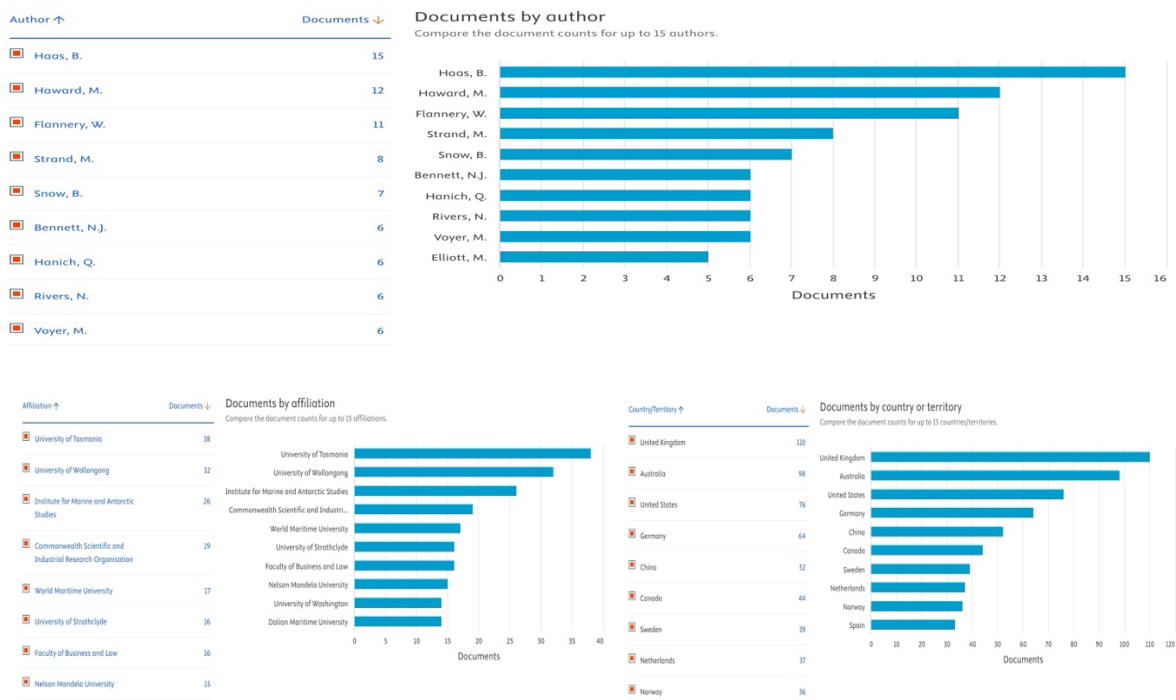
Who are the main contributors and what is the geographical distribution of research on marine resource governance?

To answer the second research question concerning the main contributors and geographical distribution of research on marine resource governance, an analysis was conducted using the Analyze Search Results feature in Scopus. This analysis seeks to identify the most productive authors, leading institutions, and countries that have shaped the development of marine governance studies. Understanding the distribution of scientific contributions is important for revealing the centers of expertise and the extent



of international collaboration in addressing marine governance challenges. Furthermore, this analysis provides insights into the global and interdisciplinary nature of the field and highlights the regions and institutions that play a crucial role in advancing policy innovation, ecosystem-based management, and collaborative governance approaches for the sustainable management of marine resources. The results of the analysis based on authors, affiliations, and countries or territories are presented in the following figure.

Figure 3.
Documents by author, affiliation and by country or territory



Source: Scopus database, 2026

Analysis based on author productivity shows that **Kelly, R.** is the most productive author in the field of marine resource governance, followed by **Fanning, L.M.** and several other scholars who have made substantial contributions to the development of this area. Meanwhile, in terms of institutional affiliation, **University of Washington** and the **University of Rhode Island** emerge as the leading institutions, followed by several universities and research organizations from Europe, North America, and Oceania. Regarding geographical distribution, the **United States** occupies the first position with the highest number of publications, followed by **Australia**, the **United Kingdom**, and several other countries, including Canada, Germany, and Norway. The dominance of these countries indicates that research on marine resource governance is largely concentrated in developed maritime nations with strong traditions in marine science, environmental policy, and ocean governance. This pattern also reflects the increasing international



attention devoted to sustainable marine management and collaborative governance approaches in response to growing environmental and socio-economic challenges.

The contributions of these leading scholars and institutions primarily focus on policy innovation, ecosystem-based management, stakeholder participation, and collaborative governance mechanisms. Earlier studies emphasized the persistence of institutional barriers and governance fragmentation that hinder effective marine management (Kelly et al., 2019; Giannopoulos, 2019). Subsequent research increasingly highlighted the importance of adaptive governance and cross-sectoral collaboration in addressing complex environmental challenges such as climate change and ocean acidification (Greenhill et al., 2020). Likewise, Dalton et al. (2020) demonstrated the significance of marine learning networks and knowledge-sharing mechanisms in strengthening governance capacity, while Fanning et al. (2021) emphasized the role of regional cooperation and integrated ocean governance in promoting sustainable resource management. These findings suggest that marine resource governance is increasingly understood not merely as a regulatory issue but as a multidimensional process involving institutions, stakeholders, and diverse knowledge systems.

Furthermore, the diversity of institutions and countries involved demonstrates that marine resource governance has evolved into a highly international and interdisciplinary field. Recent studies have increasingly focused on participatory governance, stakeholder dialogue, and science-policy interfaces as essential components of effective marine management (Weiland et al., 2021; Enright et al., 2021). More contemporary contributions have explored issues related to equity, community engagement, and the role of local knowledge in marine governance systems (O'Connor et al., 2024). In addition, emerging studies highlight the influence of technological innovation and ecosystem-based approaches on governance effectiveness. Franco et al. (2025) emphasized the importance of decision-support tools for ecosystem-based management, whereas Pastra et al. (2025) discussed the governance implications of autonomous observation technologies and digital infrastructures. Similarly, McAteer and Flannery (2025) argued that power relations and participatory mechanisms significantly shape the outcomes of community-based marine governance. These developments indicate that marine resource governance research is gradually shifting from traditional state-centered approaches toward more adaptive, collaborative, and technology-supported governance arrangements.

Overall, the distribution of authors, affiliations, and countries reflects the global and collaborative character of marine resource governance research. The predominance of institutions and countries from North America, Europe, and Oceania demonstrates the strong capacity of these regions in generating scientific knowledge and policy innovation related to marine sustainability. At the same time, the increasing diversity of contributors suggests that marine resource governance is becoming an increasingly interdisciplinary field that integrates ecological, social, institutional, and technological perspectives. Consequently, future research is likely to place greater emphasis on collaborative governance, stakeholder participation, ecosystem resilience, and innovative policy



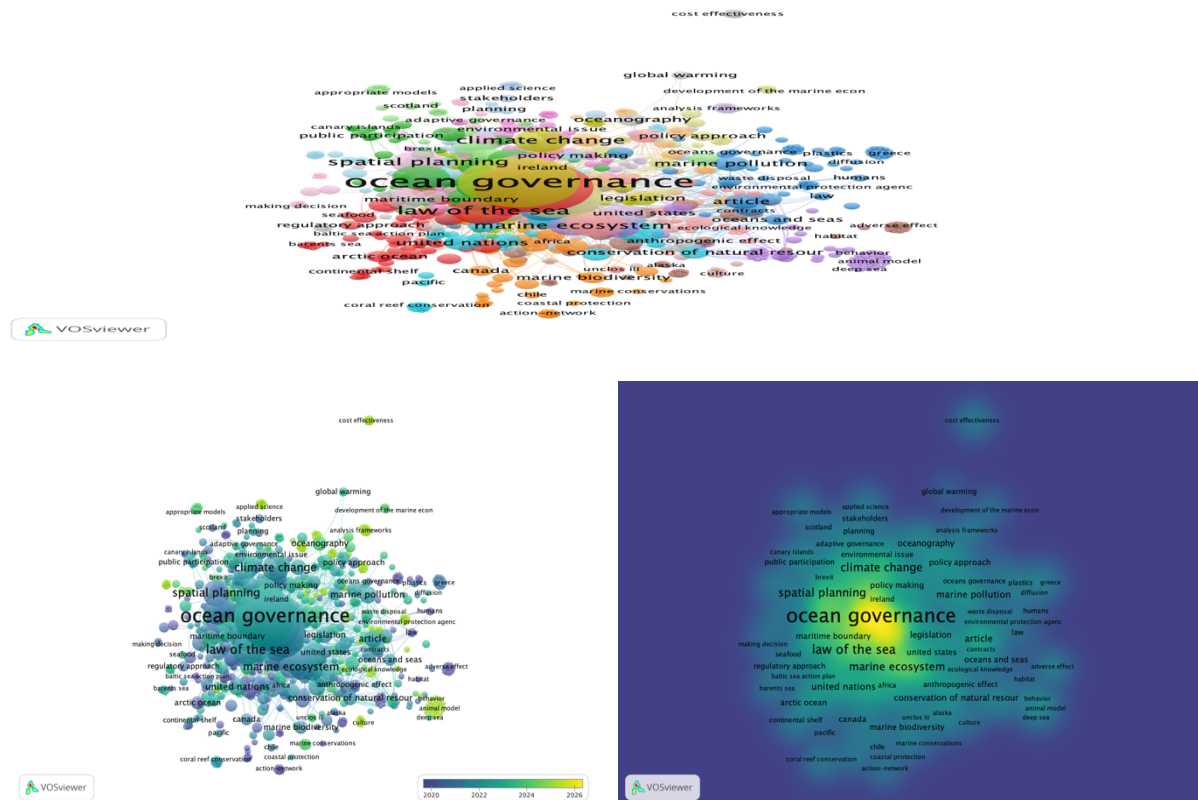
approaches that support the sustainable management of marine resources in the context of global environmental change and the blue economy.

What are the key themes, emerging issues, and emerging collaborative management approaches in research on marine resource governance?

To answer the third research question concerning the main themes, emerging issues, and collaborative management approaches in studies on marine resource governance, an analysis was conducted using VOSviewer version 1.6.20. This analysis aims to identify relationships among concepts, map thematic clusters, and illustrate the evolution of topics that characterize this field of study. The intellectual structure of the literature was examined through three complementary visualizations. Co-occurrence analysis was employed to identify relationships among keywords and determine the dominant themes and policy-related issues within the field. Furthermore, overlay visualization was used to reveal the temporal evolution and emerging trends of research topics, while density visualization was applied to identify the intensity and concentration of research activities on specific themes. Together, these analyses provide a comprehensive overview of the intellectual structure, emerging issues, policy trends, and collaborative management approaches that have shaped the development of marine resource governance research. They offer insights into how governance frameworks, stakeholder participation, ecosystem-based management, and cross-sectoral collaboration have evolved in response to increasing environmental and socio-economic challenges. The results of the VOS viewer visualizations are presented in the following figure.

Figure 4.

Co-occurrence of keywords , Overlay visualization, and Density visualization



Source: VOSViewer Output, 2026



Analysis of the keyword co-occurrence network demonstrates that *ocean governance* constitutes the central theme within the marine resource governance literature, closely linked with issues such as *spatial planning*, *law of the sea*, *climate change*, *marine pollution*, and biodiversity conservation. This pattern indicates that earlier studies primarily focused on strengthening legal frameworks, institutional arrangements, and policy coordination mechanisms for the sustainable use of marine resources. The prominence of themes related to regional ocean governance and polycentric governance further suggests that governance systems increasingly rely on coordination among multiple institutions and scales of management. Previous studies have emphasized the importance of integrating regional mechanisms and promoting polycentric arrangements to address complex marine challenges (Mahon & Fanning, 2019; Rochette et al., 2015; Gjerde & Yadav, 2021). Consequently, contemporary marine governance is no longer viewed solely as a regulatory issue but as a multidimensional process requiring institutional integration and cross-sectoral cooperation.

The overlay visualization reveals an evolution of policy trends from traditional regulatory approaches toward broader concerns involving sustainability, climate change adaptation, and blue economy development. Emerging themes associated with climate governance, marine biodiversity beyond national jurisdiction, and ecosystem resilience indicate that marine governance research has become increasingly responsive to global environmental pressures and international sustainability agendas. In parallel, studies on the blue economy have highlighted the necessity of balancing economic development with ecological sustainability and social equity. Research conducted by Keen et al. (2018) emphasized lessons from Pacific Ocean governance in defining blue economy principles, while Das et al. (2024) demonstrated that blue economy governance requires more inclusive, decentralized, and knowledge-based institutional arrangements to avoid marginalizing coastal communities. These findings suggest that current policy trends increasingly emphasize adaptive governance frameworks capable of responding to environmental change while simultaneously promoting equitable and sustainable development.

The density visualization further highlights the growing importance of collaborative management approaches within marine resource governance. Recent studies indicate a gradual transition from conventional top-down governance models toward participatory and multi-stakeholder arrangements. Stakeholder dialogue, knowledge co-production, and science-policy interfaces have been recognized as essential mechanisms for strengthening regional ocean governance and accelerating progress toward Sustainable Development Goal 14 (Weiland et al., 2021). Likewise, research on indigenous involvement in marine governance emphasizes the significance of co-governance, co-management, and ecosystem-based management to ensure equity and environmental justice (Parsons et al., 2021). Furthermore, previous studies have identified fragmented governance structures, power asymmetries, and limited stakeholder participation as major barriers to effective collaboration, while trust-building, inclusiveness, and continuous interaction have been identified as key enabling factors for successful governance transformation. Overall, these findings demonstrate that collaborative management approaches have emerged as a dominant direction in marine resource governance, reflecting a broader shift toward integrated, participatory, and adaptive governance systems capable of supporting long-term marine sustainability.



CONCLUSION

Based on the results of the bibliometric analysis, this study concludes that research on marine resource governance has experienced substantial growth and evolved into an increasingly interdisciplinary field encompassing environmental, social, economic, institutional, technological, and policy dimensions. The findings indicate that publication output has increased significantly, with developed maritime countries such as the United States, Australia, the United Kingdom, Canada, Germany, and Norway serving as the leading contributors, reflecting the global and collaborative nature of this research area. Furthermore, VOSviewer analysis reveals that ocean governance represents the central theme of the literature, closely linked to climate change, marine pollution, biodiversity conservation, spatial planning, and the law of the sea, while recent studies show a shift from traditional regulatory approaches toward sustainability-oriented and adaptive governance frameworks. More importantly, collaborative management approaches, including stakeholder participation, co-management, ecosystem-based management, knowledge co-production, science-policy interfaces, and polycentric governance, have emerged as dominant directions in contemporary marine resource governance. These findings suggest that future marine governance will increasingly rely on inclusive and adaptive governance systems capable of integrating multiple actors and knowledge systems to support sustainable ocean management and achieve global sustainability goals.

REFERENCES

- Dalton, T. M., Galdies, C., Holland, D. S., Kasperski, S., Kerr, L. A., Longo, C., ... & White, C. (2020). Marine learning networks: Building capacity and fostering collaboration for ocean governance. *Frontiers in Marine Science*, 7, 595054. <https://doi.org/10.3389/fmars.2020.595054>
- Das, S., Ghosh, S., & colleagues. (2024). Blue economy governance and inclusive institutional arrangements. *Marine Policy*, 163, 106131. <https://doi.org/10.1016/j.marpol.2024.106131>
- Donthu, N., Kumar, S., Mukherjee, D., Pandey, N., & Lim, W. M. (2021). How to conduct a bibliometric analysis: An overview and guidelines. *Journal of Business Research*, 133, 285–296. <https://doi.org/10.1016/j.jbusres.2021.04.070>
- Enright, S. R., Boteler, B., & colleagues. (2021). Regional cooperation frameworks for marine biodiversity governance. *Frontiers in Marine Science*, 8, 703451. <https://doi.org/10.3389/fmars.2021.703451>
- Fanning, L. M., Mahon, R., McConney, P., Angulo, J., Burrows, F., Chakalall, B., ... & Toro, C. (2021). Challenges to regional ocean governance in the Wider Caribbean Region. *Frontiers in Marine Science*, 8, 634718. <https://doi.org/10.3389/fmars.2021.634718>
- Franco, C., et al. (2025). Ecosystem-based management tools for marine governance. *Ocean and Coastal Management*, 262, 107578. <https://doi.org/10.1016/j.ocecoaman.2025.107578>
- Giannopoulos, A. (2019). International legal standards and synergies among environmental instruments for marine governance. *Marine Policy*, 106, 103392. <https://doi.org/10.1016/j.marpol.2018.12.011>



- Gjerde, K. M., & Yadav, S. S. (2021). Polycentric governance and regional cooperation in ocean governance. *Marine Policy*, 132, 104673. <https://doi.org/10.1016/j.marpol.2021.104673>
- Greenhill, L., Putnam, K., & colleagues. (2020). Adaptive and collaborative governance for marine ecosystem resilience under ocean acidification. *Frontiers in Marine Science*, 7, 557546. <https://doi.org/10.3389/fmars.2020.557546>
- Kelly, R., Pecl, G. T., Fleming, A., Haward, M., & colleagues. (2019). Institutional barriers and path dependency in integrated coastal and marine management. *Ocean and Coastal Management*, 177, 200–212. <https://doi.org/10.1016/j.ocecoaman.2019.04.009>
- Keen, M. R., Schwarz, A. M., & Wini-Simeon, L. (2018). Towards defining the Blue Economy: Practical lessons from Pacific Ocean governance. *Marine Policy*, 88, 333–341. <https://doi.org/10.1016/j.marpol.2017.03.002>
- Kitchenham, B., & Charters, S. (2007). Guidelines for Performing Systematic Literature Reviews in Software Engineering. Keele University and Durham University Joint Report.
- Mahon, R., & Fanning, L. M. (2019). Regional ocean governance and polycentric arrangements. *Marine Policy*, 101, 33–38. <https://doi.org/10.1016/j.marpol.2018.12.019>
- McAteer, B., & Flannery, W. (2025). Community science and power relations in marine governance. *Environmental Science and Policy*, 173, 104221. <https://doi.org/10.1016/j.envsci.2025.104221>
- O'Connor, S., et al. (2024). Participatory science and community engagement in marine protected areas. *Marine Policy*, 165, 106190. <https://doi.org/10.1016/j.marpol.2024.106190>
- Parsons, M., Fisher, K., Nalau, J., & colleagues. (2021). Indigenous involvement, co-governance, and ecosystem-based management in marine governance. *Humanities and Social Sciences Communications*, 8, 52. <https://doi.org/10.1057/s41599-021-00729-6>
- Pastra, A., et al. (2025). Autonomous observation technologies and digital infrastructures in marine governance. *Journal of Marine Science and Engineering*, 13, 1677. <https://doi.org/10.3390/jmse13091677>
- Rochette, J., Billé, R., & Molenaar, E. J. (2015). Regional oceans governance mechanisms: A review. *Marine Policy*, 60, 9–19.
- Sun, Y. (2025). Inclusive governance frameworks and adaptive capacity for small island developing states. *Innovation and Green Development*, 4(4), 100274. <https://doi.org/10.1016/j.igd.2025.100274>
- Van Eck, N. J., & Waltman, L. (2010). Software survey: VOSviewer, a computer program for bibliometric mapping. *Scientometrics*, 84(2), 523–538. <https://doi.org/10.1007/s11192-009-0146-3>
- Weiland, L., Glaser, M., Dobbins, E. L., Gregor, E. J., Ota, Y., & colleagues. (2021). Science-policy interfaces and stakeholder dialogue for transformative ocean governance. *Frontiers in Marine Science*, 8, 637938. <https://doi.org/10.3389/fmars.2021.637938>

