

Waves of progress: a bibliometric analysis of the current status and emerging trends in maritime security research

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Abstract

Purpose – Maritime security is a crucial aspect of national security. In recent years, it has become a vital factor in safeguarding maritime rights and interests, developing maritime power, and strengthening global ocean governance. This paper aims to review the current status and research hotspots of maritime security in Chinese journals, compare these findings with relevant studies from foreign-language journals, and propose directions and references for future research.

Design/methodology/approach – By employing CiteSpace visualization software and bibliometric visualization analysis from the China National Knowledge Infrastructure (CNKI), this paper conducts a visual analysis of 879 relevant publications in the CNKI database. The visualization results are then compared with research findings reported in foreign-language journals.

Findings – The analysis shows that maritime security has received increasing attention, with research activity rising sharply after 2004. Key research areas include global ocean governance and maritime security, Sino-Japanese maritime security issues, China's maritime security under the Indo-Pacific Strategy, and response strategies based on the evolving maritime security situation. The evolution of research themes has followed distinct stages, influenced by international dynamics, China's surrounding security environment, and shifts in national strategies.

Research limitations/implications – This study relies solely on data from CNKI, excluding sources from English databases such as Web of Science and Scopus. As a result, it mainly reflects maritime security research in China and may not offer a comprehensive view of global research trends.

Originality/value – This paper systematically reviews China's maritime security research output, identifies major research topics and emerging trends, and provides directions and references for future research. It also compares Chinese findings with significant international research priorities in maritime security, highlighting similarities and differences. Thus, it serves as a useful reference for international audiences seeking to understand Chinese research on maritime security.

Keywords Bibliometric analysis, Maritime governance, Maritime rights, Maritime security

Paper type Literature review

1. Introduction

Maritime security is a vital component of national security, and safeguarding maritime interests is key to establishing a strong maritime power (Zhang, 2022a, b). Currently, various

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ethnic groups, countries, regions, and the international community as a whole face a host of serious and complex maritime security challenges. These challenges include the use of the seas, maritime military competition, the evolution and construction of maritime order, maritime disputes, the protection of maritime rights and interests, marine ecological conservation, sustainable ocean development, and balancing land-sea as well as human-ocean relationships. Geopolitical rivalry in maritime spaces has intensified, making maritime security governance increasingly difficult (Liu, 2024a, b). For example, the recurring Somali piracy issue, offshore oil spill incidents, and escalating tensions among countries in the South China Sea all highlight the global significance of maritime security. In response, various countries and international organizations have introduced relevant security strategies. Notably, the United States launched a national Maritime Security Policy in 2004. In 2014, the United Kingdom, the European Union, and the African Union (AU) introduced their own maritime security strategies. The Maritime Safety Committee (MSC) of the International Maritime Organization also incorporated maritime security into its core tasks (Christian, 2015). The 21st century is often referred to as the “century of the oceans.” Like other nations, China must address the interplay of traditional and non-traditional maritime security risks (Zhang, 2022a, b). Research on maritime security can offer valuable insights to better protect China’s maritime interests and to tackle global ocean governance issues.

Before conducting further research, it is necessary to explore the concept of maritime security, which continues to evolve and lacks a universally accepted definition. One way to approach this topic is by examining how existing studies address both traditional maritime security and non-traditional maritime security. Traditionally, maritime security is viewed from a military perspective, focusing on whether a country’s territory faces invasion from the sea and whether it has a strong navy to protect itself against military threats. This perspective is closely tied to seapower and politics. The concept of seapower is related to maritime security in several ways. It first concerns the fact that naval forces are one of the major actors in maritime security. Moreover, discussions of “seapower” address how far state forces should act outside their territorial waters, engage in regions other than their own, and have a presence in international waters (Christian, 2015). Firmly based on a traditionalist understanding of national security as the protection of the survival of states, the concept of “seapower” aims at laying out the role of naval forces and at elaborating strategies for their use (Till, 2013). With ongoing scientific and technological advancements, and as human capacity to utilize ocean resources increases, non-traditional security concerns have also become intertwined with maritime security. For example, threats to marine resources, marine ecological damage and pollution, illegal fishing, and maritime crime now pose significant challenges (Ioannis *et al.*, 2019; Sardain *et al.*, 2019; Crain *et al.*, 2009; Richardson and Poloczanska, 2008; Sosnowski *et al.*, 2024). At present, threats stem from both traditional and ever-evolving non-traditional maritime security issues. Consequently, the concept of maritime security examined here remains broad, lacking a fixed, unchanging definition.

Traditional literature research methods struggle to comprehensively and accurately capture the broader landscape, emerging hotspots, and evolving patterns within maritime security research, primarily due to the sheer volume of available data. In recent years, bibliometric analysis has emerged as an effective method for understanding the research status and developmental trends in a given field. Consequently, this article employs a bibliometric approach using CiteSpace and data from the China National Knowledge Infrastructure (CNKI) to examine publication trends, prominent authors, major publishing institutions, and thematic evolution in maritime security research. The primary goal is to uncover the current status, key research areas, and emerging trends in this field, thereby offering a reference for future maritime security studies.

2. Data sources and research methods

2.1 Data sources and limitations

This study uses the China National Knowledge Infrastructure (CNKI) database as its data source, applying “maritime security” as the primary search topic. The search, conducted on

December 29, 2024, targeted academic journals and yielded 908 relevant publications. To enhance data accuracy and document validity, these 908 papers underwent a screening process, excluding conference reports, news items, book reviews, and book introductions. This selection resulted in 879 valid papers.

CNKI is a key academic journal database in China, featuring publications primarily written by Chinese researchers in the Chinese language, effectively reflecting China's research achievements in this field. However, there are limitations to this data source. Because CNKI includes relatively few foreign-language journals and overseas research papers, the data do not fully capture international research trends in maritime security.

2.2 Research methods

This study employs a systematic research design illustrated in Figure 1. CNKI's bibliometric visualization tools provide a broad overview of maritime security research by displaying annual publication trends, primary and secondary topic distribution, subject distribution, journal distribution, and author/institution distribution in bar or pie charts. However, CNKI

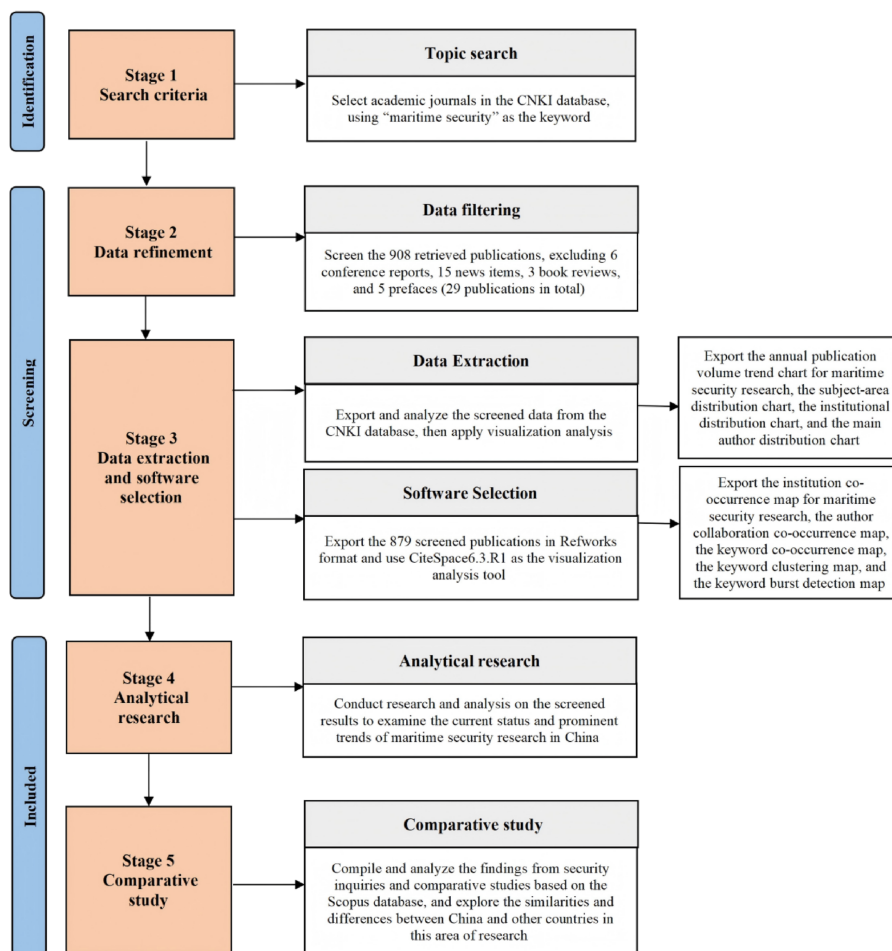


Figure 1. Research design roadmap. Source(s): Figure created by the authors

alone cannot conduct keyword co-occurrence, clustering analysis, or co-occurrence analysis of authors and institutions. To address this gap, CiteSpace 6.3.R1 is employed as an essential visualization tool. Specifically, CNKI’s visualization analysis first uncovers annual publication trends, major subject areas, high-impact authors, institutions, and highly cited articles, offering a preliminary understanding of the research landscape. CiteSpace is then used to generate keyword co-occurrence, clustering, time-zone, peak, and burst graphs, thereby revealing key research topics and trends in maritime security.

3. Overview of maritime security research

3.1 Annual publication analysis

Publication volume reflects the level of attention and scholarly interest in maritime security. Based on annual publication data (Figure 2), national security research on this topic can be divided into three stages: (1) before 2004, when the research was in its infancy, and articles were few; (2) from 2004 to 2015, a period of rapid growth with a marked surge in publications; and (3) post-2015, when the research trend stabilized.

From 2004 onward, there was a steady rise in research on maritime security, suggesting an increasing academic focus on this area. On April 25, 2005, the State Council approved the establishment of “China Maritime Day” on July 11 to commemorate Zheng He’s inaugural voyage to the West. This event heightened public awareness of ocean-related issues and prompted greater efforts to strengthen the nation’s maritime capabilities. That same year, the “National Government Management and Ocean Strategy Academic Seminar” convened on Daishan Island in Zhoushan, Zhejiang. Participants unanimously agreed that achieving national rejuvenation required China to become a maritime power. They stressed the urgent need to enhance national maritime awareness, formulate a feasible maritime strategy, and establish a strategic defense mechanism for safeguarding China’s maritime rights and interests (Li and Huang, 2005). In 2008, the State Council issued the “National Marine Development Planning Outline” which provided a systematic approach to advancing the country’s marine sector in the new century, covering topics such as the sustainable use of marine resources, marine environmental and ecological protection, coordinated marine economic development, marine public services, maritime law enforcement and rights protection, international maritime affairs, and marine science and education (Jin, 2019). In 2010, a Japan Coast Guard patrol vessel collided with a Chinese trawler near the Diaoyu Islands. Two years later, Japan’s “purchase of the Diaoyu Islands” sparked a severe maritime security crisis between China and Japan. During the same period, the United States introduced its “Pivot to Asia Strategy,” redeploying political, military, and economic resources to the Asia-Pacific region. These events collectively influenced maritime security dynamics in the area. Between 2008

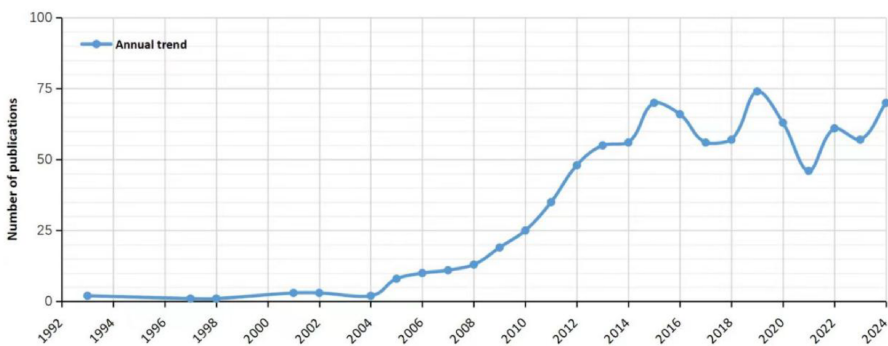


Figure 2. Annual publication trend in maritime security research. **Source(s):** The original data was obtained from CNKI and compiled by the authors

and 2015, there was a marked increase in maritime security research. After 2015, publication levels stabilized but remained relatively high. Following the announcement of the “Indo-Pacific Strategy” by the United States in 2017, tensions in the South China Sea also intensified. Scholarly interest in maritime security surged, driven by new government maritime policies and an increasingly severe maritime security environment.

3.2 Subject area distribution analysis

Figure 3 shows that maritime security research concentrates on four primary subject areas: Chinese Politics and International Politics, Oceanography, International Law, and Military Affairs. Chinese Politics and International Politics account for 43.83% of the total, indicating that maritime security is closely tied to national governance and international relations. Furthermore, resolving maritime security issues requires insights from ocean-related disciplines, as well as law and military studies.

3.3 Analysis of publishing institutions and authors

3.3.1 Institutional publication volume. Institutional publication volume provides a quantitative measure of each institution’s influence in a given research field (Li and Yu, 2024). According to the institutional distribution map generated by CNKI’s bibliometric analysis (Figure 4), Ocean University of China, Wuhan University, Shandong University, Nanjing University, Renmin University of China, and Dalian Maritime University are the primary contributors to maritime security research. Ocean University of China leads in publication count, with 43 articles. These institutions play a key role in maritime security studies and exert a substantial impact on the field.

Further analysis of collaboration among major research institutions was conducted using the CiteSpace software. As shown in Figure 5, the institutional collaboration network comprises 356 nodes and 208 connecting lines, indicating a relatively positive level of cooperation. In particular, the School of International Affairs and Public Administration at Ocean University of China, the School of International Studies at Renmin University of China, the Institute of Japanese Studies at the Chinese Academy of Social Sciences, and the China Institutes of Contemporary International Relations exhibit high connectivity. This suggests frequent publications and robust collaboration with other institutions. By contrast, while the Collaborative Innovation Center of South China Sea Studies at Nanjing University and the Center for Maritime Strategic Studies at Peking University are clearly represented, they have fewer connections, pointing to relatively limited collaboration.

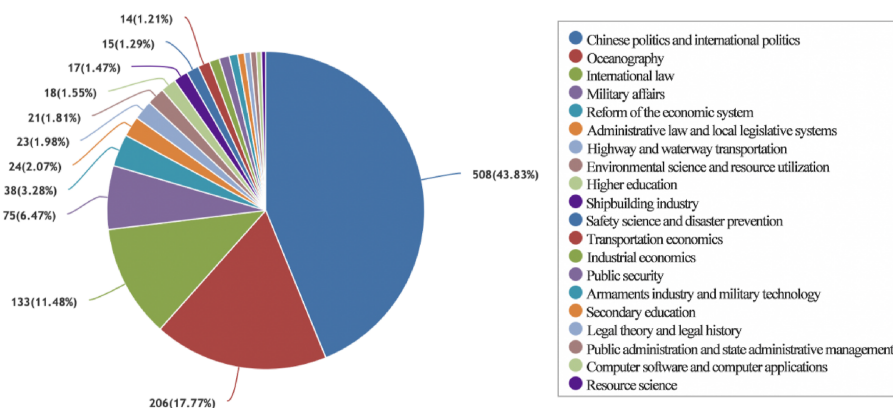


Figure 3. Subject area distribution of maritime security research. **Source(s):** The original data was obtained from CNKI and compiled by the authors

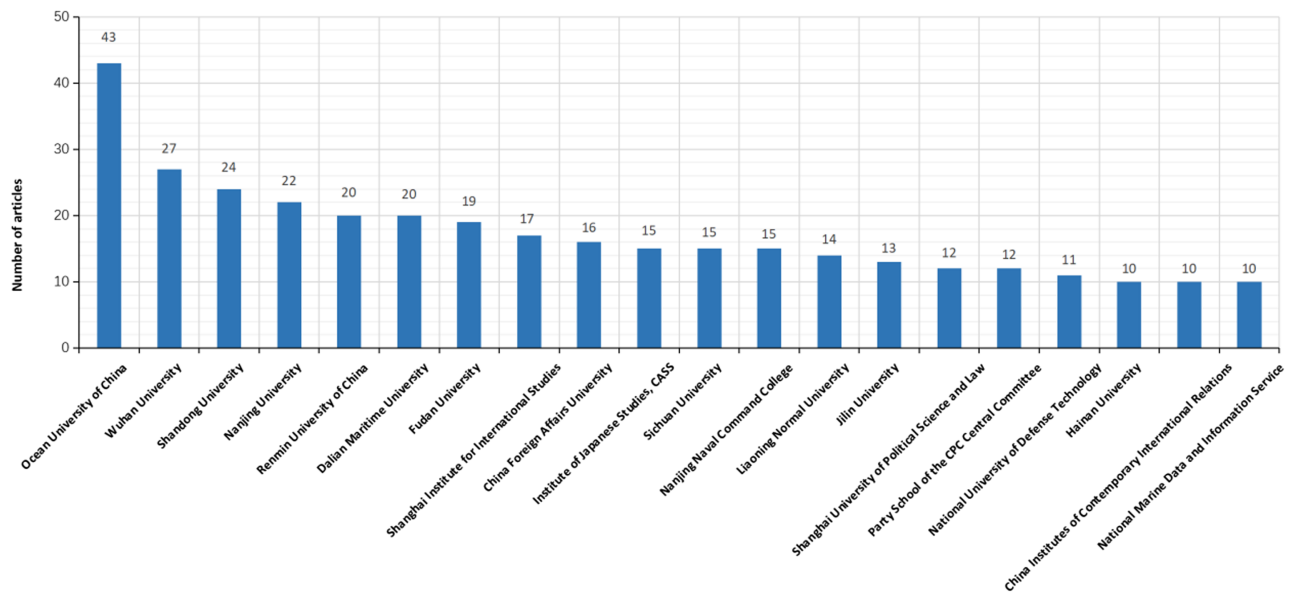


Figure 4. Institutional distribution of maritime security publications. **Source(s):** The original data was obtained from CNKI and compiled by the authors

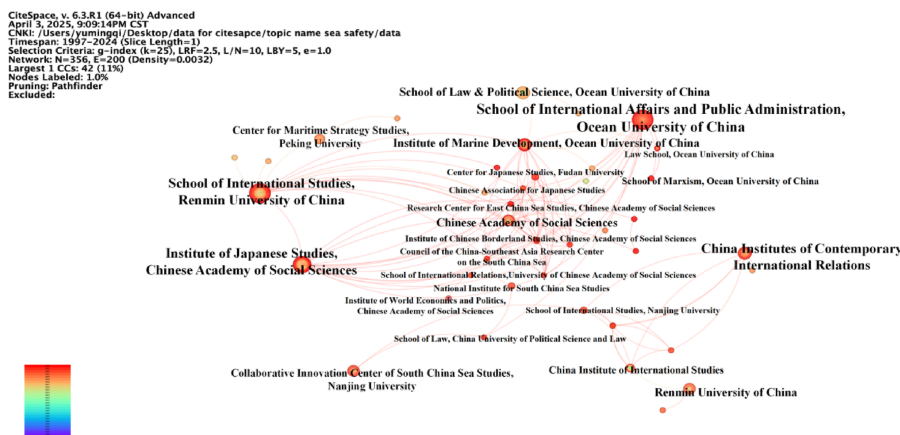


Figure 5. Institutional co-occurrence network in maritime security research. **Source(s):** The original data was obtained from CNKI and compiled by the authors

3.3.2 Analysis of authors. From the major author's distribution map generated by CNKI's bibliometric analysis (Figure 6), the top ten authors by publication volume in maritime security research are: Yang Zhen, Wang Jingchao, Lyu Yaodong, Feng Liang, Zhang Jingquan, He Jian, Jin Yongming, Zeng Xiangyu, Hu Jie and Shan Tianlei. To further assess significant contributors with considerable influence, the H-index rankings were also examined. Proposed by Hirsch in 2005, the H-index measures both productivity and citation impact. In this metric, an H-index of "H" means that a researcher has at least H papers, each cited at least H times (Luo and Hu, 2023). According to CNKI's H-index rankings for maritime security research, the top ten scholars are Jin Yongming, Song Dexing, Liu Huaxin, Zhang Jingquan, Lyu Yaodong, Yang Zhen, He Jian, Li Jingyu, Cai Liang, and Hu Bo. Comparing both publication volume and H-index rankings, Yang Zhen, Lyu Yaodong, Zhang Jingquan, He Jian, and Jin Yongming appear in the top ten of both lists, indicating their substantial contributions and strong influence in maritime security research.

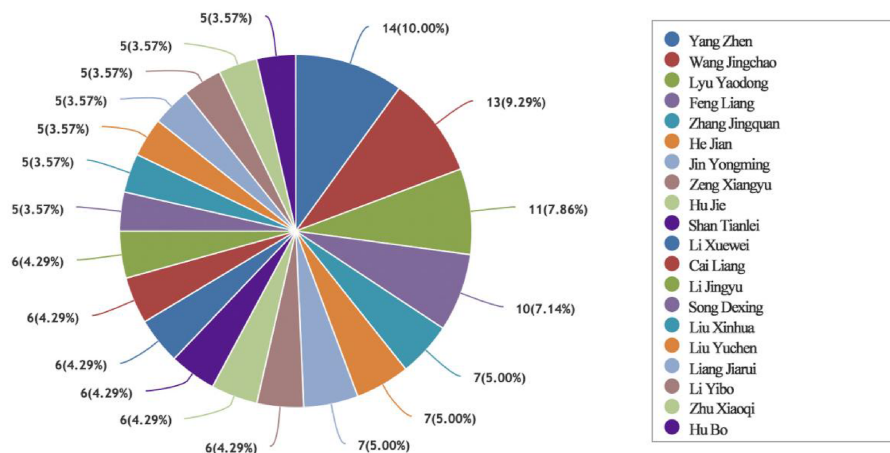


Figure 6. Major authors in maritime security research. **Source(s):** The original data was obtained from CNKI and compiled by the authors

An author collaboration network map (Figure 7), generated using CiteSpace, visually depicts the level of cooperation among researchers in this field. This network reveals 442 nodes and 137 connections, suggesting a “highly scattered, loosely clustered” pattern. In other words, collaboration remains limited. Small clusters generally involve core authors working with a few collaborators, and there is limited interaction among core authors themselves. Consequently, there is significant potential to strengthen academic exchange and collaboration in maritime security research.

4. Analysis of research hotspots and trends in maritime security

Keywords capture the core content of a paper. Frequently occurring keywords pinpoint a field’s focal points and level of scholarly interest, reflecting prominent research methods, pressing issues, or themes that researchers find compelling (Zhao, 2014). By applying co-occurrence, clustering, and burst-detection analyses to keyword data on maritime security research in the CiteSpace software, researchers can more clearly identify key issues and emerging trends in this domain.

4.1 Keyword co-occurrence analysis

Keyword co-occurrence and burst-detection maps reveal which terms appear most frequently, how they interconnect, and when they arise. This approach highlights a field’s principal topics and shows how they evolve. As illustrated in Figure 8, the keyword co-occurrence map for maritime security research contains 398 nodes and 789 links—indicating close interrelationships among keywords. A larger font size signifies higher keyword frequency and, thus, greater research emphasis. From the figure, notable hotspots or geographic focuses include national security, maritime power, maritime strategy, maritime governance, maritime rights and interests, Japan, and the Indo-Pacific strategy.

4.2 Keyword clustering analysis

Building on the co-occurrence map, keyword clustering analysis pinpoints the primary themes in maritime security research. CiteSpace assesses clustering with the modularity (Q-value) and mean silhouette (S-value) metrics. Q-values range from 0 to 1, with values above 0.3 denoting



Figure 7. Author collaboration network in maritime security research. Source(s): The original data was obtained from CNKI and compiled by the authors

CiteSpace, v. 6.3.R1 (64-bit) Advanced
April 3, 2025, 10:43:77PM CST
CNKI: /Users/yuming/Desktop/data for citesapce/topic name sea safety/data
Timespan: 1997-2024 (Slice Length=1)
Selection Criteria: g-index (k=25), LRF=2.5, L/N=10, LBV=5, e=1.0
Network: N=398, E=657 (Density=0.0083)
Largest 1 CCs: 312 (78%)
Nodes Labeled: 1.0%
Pruning: Pathfinder
Modularity Q=0.6645
Weighted Mean Silhouette S=0.9007
Harmonic Mean(Q, S)=0.7648
Excluded:

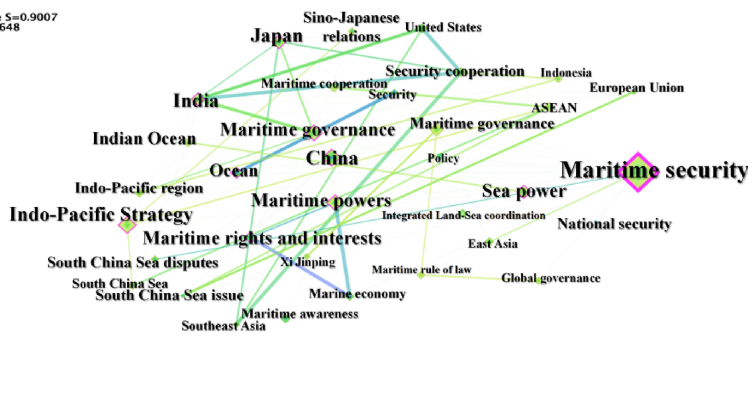


Figure 8. Keyword co-occurrence map of maritime security research. **Source(s):** The original data was obtained from CNKI and compiled by the authors

a clear clustering structure; S-values above 0.7 indicate that clusters are both efficient and reliable (Chen *et al.*, 2014). Using CiteSpace, this study generated a keyword clustering map (Figure 9) with a Q-value of 0.5924 and an S-value of 0.8891, demonstrating a notable, highly reliable clustering structure.

A total of 13 clusters emerged: “#0 Maritime Security,” “#1 Japan,” “#2 Indo-Pacific Strategy,” “#3 Maritime Rights and Interests,” “#4 India,” “#5 Integrated Land-Sea Coordination,” “#6 Ocean,” “#7 Sea Power,” “#8 Law of the Sea,” “#9 China,” “#10 National Security,” “#11 Historical Origins,” “#12 Command of the Sea,” and “#13 Maritime Awareness.” By examining these clusters and their associated keywords, researchers can merge or refine overlapping clusters to summarize the major themes in maritime security.

CiteSpace, v. 6.3.R1 (64-bit) Advanced
April 4, 2025, 12:46:24AM CST
CNKI: /Users/yuming/Desktop/data for citesapce/topic name sea safety/data
Timespan: 1997-2024 (Slice Length=1)
Selection Criteria: g-index (k=25), LRF=2.5, L/N=10, LBV=5, e=1.0
Network: N=398, E=789 (Density=0.01)
Nodes Labeled: 1.0%
Pruning: Pathfinder
Modularity Q=0.5924
Weighted Mean Silhouette S=0.8891
Harmonic Mean(Q, S)=0.711
Excluded:



Figure 9. Keyword clustering map of maritime security research. **Source(s):** The original data was obtained from CNKI and compiled by the authors

4.2.1 Research on maritime security and global ocean governance. From Cluster #0 (Maritime Security) and its core keywords, maritime security and global ocean governance emerge as central topics. In recent years, maritime security has become increasingly complex, with traditional and non-traditional security threats interwoven. Given this, many scholars emphasize that addressing maritime security is a critical task for global ocean governance. Researchers have also explored the significance of the concept of a “Maritime Community of Shared Future” (or “Marine Community of Common Destiny”) in tackling maritime security issues.

Yang (2022) highlights that both traditional and non-traditional security threats in the maritime domain have become more prominent and global in nature. These challenges are so complex and widespread that no single nation or actor has the resources or capacity to address them effectively, underscoring the importance of global ocean governance. Fu and Chen (2018) argue that maritime security is a fundamental issue in global ocean governance that cannot be ignored, and they assert that cooperative security is essential for solving this issue. Lu (2022) contends that building a Maritime Community of Shared Future involves three main components, with establishing a maritime security community as the top priority. China’s proposal to create this community promotes a new concept of security that is common, comprehensive, cooperative, and sustainable. It calls for a security framework based on equality, mutual trust, fairness, justice, shared development, and collective benefits.

Adopting East Asia as a case study, Gong and Ye (2021) discuss how the Maritime Community of Shared Future provides a foundation for building a trust mechanism for maritime security cooperation. This concept encourages regional collaboration by fostering broad trust and aligning interests. As a result, East Asian countries can enhance mutual trust, pursue mutually beneficial maritime cooperation, and build inter-state trust across areas of interests, institutions, and shared values. Constructing a maritime security trust mechanism to foster cooperation exemplifies China’s approach to a Maritime Community of Shared Future in the East Asian region. Jiang and Chen (2024) observes that maritime competition has long been unpredictable, and consensus on maritime values has weakened amid disputes and competition for resources. The monopolization of discourse, frameworks, and governance in the ocean sector has failed to address urgent global maritime issues. Xi Jinping’s influential statements on the Maritime Community of Shared Future respond not only to international concerns about China’s maritime ambitions but also offer a shared value consensus that transcends ideological differences and interest divides. This approach provides an innovative strategy for shaping a new global ocean governance framework and demonstrates significant forward-thinking value.

4.2.2 Research on maritime security issues between China and Japan. According to Cluster #1 (Japan), research on Sino-Japanese maritime security issues represents the second major focus in maritime security studies. Japan, a key maritime neighbor of China, plays a significant role in China’s maritime security. As a result, Japan has become a major focus in research on China’s maritime security. Scholars primarily examine the formation and trends of Japan’s maritime strategy, as well as the effects of Japan’s security strategy adjustments on China’s maritime security and China’s corresponding responses.

Japan’s maritime strategy is closely tied to the security structure of East Asia, influenced by a complex array of factors, including the Japan-U.S. alliance and China’s rise (Gao, 2012). Japan’s strategic adjustments toward China are largely shaped by US policy. In the context of China-Japan maritime disputes, US strategic shifts have prompted Japan to take a series of actions. For instance, Japan has raised Taiwan’s position in its new maritime strategy, aligning with the US “Asia-Pacific Rebalancing” strategy and using Taiwan to counter China’s development, ultimately aiming to create a Japan-led “maritime alliance” (Zhu and Zhu, 2012). Japan’s maritime security strategy, in collaboration with the US, sees China as the primary competitor. They have sought to limit China’s maritime space, intensifying efforts to contain China’s maritime development (Kuang, 2022). Recently, as China’s national power has rapidly grown and maritime disputes between China and Japan, as well as between China

and India, have escalated, Japan has strengthened its maritime cooperation with India. With the US implementation of the “Indo-Pacific Strategy,” Japan-India maritime cooperation is becoming increasingly important, impacting China’s maritime security environment (Yang and Cai, 2019).

Additionally, Japan’s maritime policies have influenced China’s maritime security and the stability of East Asia. The “New Security Law” has become a cornerstone of Japan’s global security strategy, heightening tensions over the Diaoyu Islands and the East China Sea in an effort to constrain China’s legitimate maritime rights and interests. Recently, Japan has expanded its focus on East Asian security issues in its annual Defense White Paper and Diplomatic Blue Book, clearly signaling its pressure on the Korean Peninsula, amplifying the “China threat,” and escalating tensions over the Diaoyu Islands, East China Sea, and South China Sea. These moves further strengthen Japan’s security policies aimed at China (Lyu, 2018). Japan has long considered Maritime Domain Awareness (MDA) a critical component of its maritime policy, driven by the misperception of the “China threat” and its ambition to assist the US in containing China. Japan’s active role in MDA assistance will exacerbate maritime conflicts between China and South China Sea littoral states, increasing these countries’ security dependence on Japan and fostering a “camp-based” regional order (Xu and Wang, 2023). Japan’s comprehensive maritime security strategy emphasizes military deterrence and offensive capabilities, complicating the regional maritime security situation and negatively affecting political trust and maritime cooperation between China and Japan (Fang, 2024).

Given these dynamics, many scholars suggest that China and Japan should strengthen dialogue and cooperation to foster positive developments in bilateral relations. Both countries should enhance consultations and dialogue on maritime issues, establish effective crisis management mechanisms, and promote the development of strategic mutual benefit (Zhu and Zhu, 2012). China and Japan should actively engage in coordination and cooperation to maximize their maritime interests. Looking ahead, there is considerable potential for expanding existing areas of cooperation. New opportunities lie in aligning the “Belt and Road” initiative with Japan’s maritime strategy, as well as in bilateral and third-party maritime cooperation, Arctic affairs, and marine cultural exchanges. Both sides should seize these opportunities, take proactive measures, and deepen their maritime cooperation (Zhang et al., 2020).

4.2.3 Research on China’s maritime security situation under the Indo-Pacific strategy. Cluster #2 (Indo-Pacific Strategy), Cluster #4 (India), and Cluster #11 (Historical Origins) are all associated with the Indo-Pacific Strategy. Combining these three clusters helps illuminate China’s maritime security situation under that strategy. As China’s economy grows and its maritime power strengthens, the United States has increasingly focused on maritime containment strategies against China. The Pacific and Indian Oceans, both of which are closely linked to China’s interests, have become key areas of attention, prompting the formulation of the US Indo-Pacific Strategy. The US Indo-Pacific Strategy is primarily aimed at China. The US believes that China’s rapid economic development and growing military capabilities are enhancing its influence in the region, thereby challenging US dominance and reshaping the regional order (Wang, 2019). As a result, China’s maritime security situation has become more complex and dynamic under the influence of this strategy. Scholars have focused on three key areas: the impact of the Indo-Pacific Strategy on China’s maritime security, the adjustments in the maritime strategies of China’s neighboring countries, and China’s responses to these developments.

The US Indo-Pacific maritime alliance has evolved into a networked structure, with China positioned as its primary strategic target. Maritime security cooperation now forms the core of this alliance. The alliance may affect China’s maritime security environment, surrounding hotspot issues, and the implementation of the “Belt and Road” initiative (Wang, 2019). Under the Indo-Pacific Strategy, China’s maritime security environment is evolving. The US-led networked security framework increasingly contains China while the South China Sea dispute grows more complex. As a result, the likelihood of armed conflict is rising (Wang, 2019).

The “QUAD” (US, Japan, India, and Australia) has been instrumental in promoting the “Indo-Pacific Maritime Domain Awareness Partnership,” which aims to strengthen information sharing, capacity-building, and data collection in Southeast Asia, the Indian Ocean, and Pacific Island waters. The initiative also seeks to regulate the regional maritime order in the long term. This reflects a geopolitical approach targeting China, with the US leading the alliance and its partners cooperating (Liu, 2024a, b).

Influenced by the Indo-Pacific Strategy, other countries, especially those in China’s vicinity, have adjusted their policies toward China. For example, Singapore, though not a claimant in the South China Sea dispute, has changed its position in response to both ASEAN’s geopolitical needs and its own interests. Under the Trump administration’s Indo-Pacific strategy, Singapore shifted from a stance of “neutrality” to one of “limited intervention,” publicly voicing its position on China’s claims. This shift has affected China’s maritime security, complicating China’s efforts to assert its maritime rights and interests, internationalizing maritime competition, and prolonging regional disputes (Liu, 2021).

To mitigate the adverse impacts of the Indo-Pacific Strategy on China’s maritime security, some scholars suggest that China should adopt targeted measures, such as implementing specific strategies for dividing alliances, promoting China-U.S. maritime security cooperation, strengthening China-Russia maritime security collaboration, and leveraging multilateral mechanisms to counteract these effects (Li, 2020). In order to effectively address the US Indo-Pacific Strategy, China should maintain strategic composure, deepen economic and trade cooperation with Indo-Pacific nations, enhance communication and coordination, and establish mechanisms that foster economic development, peace, and stability in the region (Wang, 2019).

4.2.4 Research on response strategies based on the maritime security situation. Meanwhile, Cluster #3 (Maritime Rights and Interests), Cluster #5 (Integrated Land-Sea Coordination), Cluster #6 (Oceans), Cluster #7 (Sea Power), Cluster #8 (Maritime Law), Cluster #9 (China), Cluster #10 (National Security), Cluster #11 (Historical Origins), Cluster #12 (Command of the Sea), and Cluster #13 (Maritime Awareness) all address China’s strategies for responding to a range of maritime security challenges. Integrating these clusters provides insights into China’s evolving strategic approaches within a dynamic maritime security environment. In recent years, China’s maritime security situation has become increasingly complex, with both traditional and non-traditional security threats. In response, research on China’s strategies to address these challenges has emerged as a key area of focus within maritime security studies. Scholars have primarily explored topics such as maritime security governance concepts, practical approaches to maritime security, and the development of maritime security rule of law.

Regarding maritime security governance concepts, some scholars argue that, as a builder of world peace, a contributor to global development, and a defender of international order, China is advancing toward becoming a maritime power. Active participation in global maritime security governance is not only a necessary choice but also a responsibility. Therefore, China should leverage its experiences and recognize its identity as a developing country to update global maritime security governance concepts. This includes building a multi-center global maritime security governance framework, enhancing the operational capacity of governance mechanisms, and strengthening the authority of global maritime security governance organizations. These efforts would contribute to the reform and improvement of the global maritime security governance system (Wang, 2024). In terms of ensuring maritime security, China, drawing on historical lessons and addressing current challenges, advocates a “governance” approach instead of “conquest,” “control,” or “dominance” to address the maritime security deficit. It promotes shared responsibilities and rights in maritime security governance, where all actors and individuals not only have the right to security but also bear corresponding security obligations (Liu, 2024a, b).

In discussing practical pathways for China’s maritime security, some scholars suggest that this approach involves setting clear maritime security strategic goals, securing maritime safety through regional and cross-regional economic and trade cooperation, and fostering maritime

security cooperation through shared values. Ultimately, the approach focuses on comprehensive maritime security. Key practices to advance this include building a “maritime power,” developing the “Maritime Silk Road,” and constructing a “Maritime Community of Shared Future” (Zhang, 2022a, b). To modernize maritime security governance, several strategies should be implemented: strengthening top-level design, establishing a collaborative maritime security governance mechanism, enhancing maritime power construction to improve governance bodies’ effectiveness, raising national maritime awareness, and promoting a new maritime security perspective. Additionally, China should focus on maritime technological innovation to support governance and adhere to the “Maritime Community of Shared Future” concept to foster global maritime security cooperation (Yang, 2024). Specific measures include securing territorial space through coordinated land and sea development strategies; safeguarding maritime rights and interests with effective regional actions; improving resource utilization to ensure maritime resource security; prioritizing sustainable development to protect maritime economic security; addressing marine ecological security by targeting pollution in key sea areas; innovating management models for maritime departments to ensure maritime social security; securing maritime information dominance to ensure information security; improving maritime route security by enhancing strategic connectivity; advancing maritime military security through practical efforts to build a Maritime Community of Shared Future; and promoting global maritime security by advancing China’s maritime power status (Li and Zhang, 2021).

Finally, many studies emphasize that the rule of law is essential for ensuring maritime security. Key measures for protecting maritime rights and interests and maintaining security include actively adhering to international, regional, and bilateral treaties related to maritime issues, with a focus on formulating and refining domestic maritime policies and laws (Jin, 2010). This involves clarifying the constitutional status of the oceans, developing a “Basic Maritime Law,” establishing principles for safeguarding maritime security, advancing reforms to the “three-in-one” trial mechanism in maritime courts, clarifying responsibilities and procedures for maritime security law enforcement bodies, and building a specialized training system for maritime security legal professionals (Guo and Yan, 2024). Efforts should also focus on accelerating the development of a maritime security legal system, promoting the establishment of maritime security command and early warning systems, integrating maritime security with technological innovations, and building both a theoretical system for maritime security and an international discourse system for maritime security (Wang and Zhang, 2023).

4.3 Analysis of the evolution of research themes

The keyword burst detection map created by CiteSpace software provides a clear visualization of the evolution of key research hotspots. As shown in Figure 10, maritime security research has evolved through three distinct stages. From 2005 to 2012, the primary focus was on maritime rights and interests, national security, and maritime strategy. Between 2013 and 2019, the main topics shifted to Japan, the United States, and maritime awareness. After 2019, attention shifted to the Indo-Pacific Strategy, maritime governance, maritime rule of law, and the concept of maritime power.

5. Comparison with global maritime security research

Using the CNKI database as its foundation, a visualization analysis of maritime security research is conducted, reflecting China’s progress in this field. However, maritime security issues typically transcend national borders, making a comparative view of global maritime security research essential. Such a comparison can reveal both similarities and differences between Chinese and international research, thus broadening the scope for future studies. In this context, Kismartini *et al.* (2024) conducted a visualization analysis of articles in the Scopus database—where “maritime security” served as a keyword—using VOSviewer and NVIVO

Top 10 Keywords with the Strongest Citation Bursts

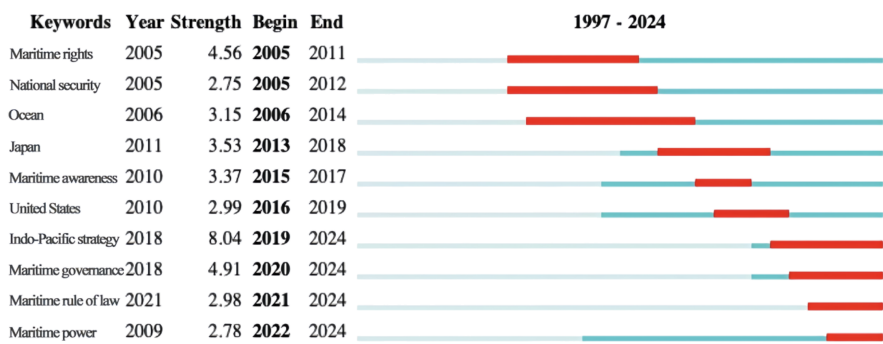


Figure 10. Keyword burst detection map of maritime security research. Source(s): The original data was obtained from CNKI and compiled by the authors

software. This approach effectively highlights worldwide trends in maritime security research. By comparing the CNKI-based visualization findings with Kismartini’s results, this paper offers insights into the trajectory of maritime security studies in both China and the global arena.

Scopus is a major database for English-language research, and Kismartini’s study provides a strong reflection of international research dynamics. According to that study, the United States, the United Kingdom, Australia, China, Italy, Indonesia, Singapore, Sweden, India, and South Africa are the ten most active countries in maritime security research. China ranks third, addressing not only South China Sea disputes and the “new silk road,” but also technology and shipping security issues (Kismartini *et al.*, 2024). This finding reinforces China’s status as a leading contributor to global maritime security research. A more complete view of China’s impact requires examining its output in the CNKI database of Chinese-language journals. Based on China’s ranking and publication volume in CNKI, it is clear that China actively participates in international maritime security discussions.

A clustering comparison adds depth to this analysis. Kismartini’s research identifies six main clusters in global maritime security studies. Cluster #1 covers maritime safety research trends. Cluster #2 focuses on international cooperation against various maritime security threats, such as port security and counterterrorism at sea. Cluster #3 addresses Maritime Security Policy at the regional level, highlighting interactions between regional geopolitics and maritime security. Cluster #4 examines the Blue Economy, governance, national security, piracy, and private security. Cluster #5 includes regions closely linked to maritime security, such as the Indian Ocean, Indo-Pacific, Pacific Ocean, and Southeast Asia, as well as disputed zones like the South China Sea. Cluster #6 deals primarily with the International Law of the Sea (Kismartini *et al.*, 2024).

Comparing these conclusions with CNKI-based cluster analyses shows that although global ocean governance is also an important focus for Chinese scholars, domestic interests and regions directly connected to national concerns remain at the forefront of China’s maritime security research. Scholars particularly analyze China’s response to maritime security threats in areas such as the East China Sea—where Sino-Japanese issues arise—and the South China Sea, influenced by the Indo-Pacific Strategy.

6. Research conclusions and outlook

6.1 Conclusions

Based on the China National Knowledge Infrastructure (CNKI) database, this study used CiteSpace visualization software and CNKI bibliometric analysis to examine maritime

security-related literature. Since 2004, the volume of publications on maritime security has grown rapidly, with an average of approximately 60 articles published per year in recent years. This trend highlights maritime security as a major research hotspot in China. The co-occurrence network map of authors shows sparse connections, suggesting limited collaboration within the field. This emphasizes the need for stronger collaborative efforts moving forward. In terms of research hotspots, maritime security studies have focused on several areas: global ocean governance and maritime security, Sino-Japanese maritime security issues, China's maritime security under the Indo-Pacific Strategy, and response strategies based on the evolving maritime security situation. The development of these research themes has been influenced by international dynamics, China's regional security environment, and shifts in national strategies. These key issues reflect both domestic and international concerns at the time. From a comparative analysis of global maritime security research, China stands out as a key contributor in this field. However, much of China's research focuses primarily on domestic maritime security issues.

6.2 Outlook

China's maritime security situation remains complex and dynamic, and it is facing numerous challenges. Based on the current state of research, future studies could focus on the following areas:

- (1) Strengthen collaboration between authors and institutions, particularly through interdisciplinary research.
- (2) Foster greater cooperation among international research institutions and authors to explore global maritime security challenges collectively.
- (3) Maritime security is inherently global. Although Chinese research tends to concentrate on China-specific issues and regions, future work could benefit from expanding to encompass broader international security concerns.
- (4) Intensify research on methods and strategies for addressing worldwide maritime security challenges, particularly those linked to non-traditional threats, and explore governance models suited for global maritime security needs.

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