The Rise of Posthumanism in Marine Ecotourism: A Comprehensive Bibliometric Analysis

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Abstract

This study explores the intellectual landscape of posthumanism in the context of ecotourism and sustainability through a bibliometric and keyword co-occurrence analysis using VOSviewer. By mapping the collaboration networks of authors and countries, and visualizing the co-occurrence of key terms, the research identifies the most influential contributors, emerging thematic clusters, and interdisciplinary linkages within the field. The study reveals that authors from the United Kingdom, Canada, and Australia are central to scholarly collaborations, while thematic clusters show an integration of critical theory, environmental justice, and sustainable development. Keyword analysis highlights the growing traction of philosophical and ecological terms that emphasize more-than-human perspectives in tourism research. These findings underscore the importance of rethinking traditional tourism paradigms and advocate for a more inclusive, relational, and sustainable approach to ecotourism grounded in posthumanist ethics.

Keywords: *Post Humanism, Marine Ecotourism, Sustainability, Bibliometric Analysis, VOSviewer.*

Introduction

Marine tourism is a form of tourism that focuses on exploiting the potential of the sea and coastal areas as its main attraction (Prihadi, D.J. 2025). The rapid expansion of ecotourism as a sustainable alternative to mass tourism has stimulated intense academic interest and policy discourse, particularly in marine environments. Marine ecotourism encompasses a range of nature-based tourism activities that occur in coastal and oceanic ecosystems, including coral reef exploration, whale watching, and marine conservation initiatives (Higham & Lück, 2007). This form of tourism not only generates economic benefits but also aims to foster environmental stewardship and community involvement (Marcovaldi & Dei Marcovaldi, 1999; Moreno & Becken, 2009). However, as marine ecotourism grows in complexity, new paradigms have emerged to critique the anthropocentric foundations of sustainability and conservation, most notably through the lens of posthumanism (Copeland et al., 2023; Hurst, 2023; Thomsen et al., 2023). Posthumanism, as a philosophical and ethical framework, decouples human centrality from ecological interactions and advocates for a more inclusive understanding of non-human agency and interspecies entanglements (Fennell, 2023; López et al., 2023; Schofield & Ugwuanyi, 2023). This shift calls for a reassessment of marine ecotourism practices and their representations in academic literature.

Posthumanist discourse has challenged conventional views of nature as a resource to be managed or preserved solely for human benefit. Instead, it promotes the recognition of animals,

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ecosystems, and even technologies as co-agents in shared ecological processes (Haraway, 2016). In marine ecotourism, this perspective has prompted new debates on the ethical implications of human-marine life encounters and the need to transcend instrumental views of marine species (Salafsky et al., 2001; Vianna et al., 2012). For example, activities such as dolphin swimming and shark cage diving are increasingly scrutinized not only for their environmental impact but also for their ethical dimensions, questioning the commodification of sentient marine beings (Probyn-Rapsey, 2017). Posthumanism offers tools to deconstruct such utilitarian logics and encourages the formation of empathetic, respectful, and transformative relations between humans and marine others. In this context, the intersection between posthumanist philosophy and marine ecotourism constitutes a critical frontier in both tourism studies and environmental humanities.

The academic engagement with posthumanism in the realm of marine ecotourism has grown noticeably over the past decade, as evidenced by the increasing number of publications exploring non-human agency, affective ecologies, and the politics of marine conservation (Neimanis, 2017; Yusoff, 2017). However, the literature remains fragmented, with conceptual innovations often scattered across diverse disciplines such as environmental philosophy, critical tourism studies, marine biology, and anthropology. There is a pressing need to consolidate and map this emerging knowledge domain to identify key contributors, thematic trends, methodological approaches, and potential research gaps. Bibliometric analysis, as a methodological tool, allows scholars to synthesize large volumes of academic output and trace the intellectual structure and evolution of a research field (Donthu et al., 2021). By applying bibliometric techniques, it becomes possible to assess how posthumanist themes have been incorporated into marine ecotourism literature and to visualize the scholarly networks and citation dynamics that shape this interdisciplinary area.

Furthermore, the rise of posthumanism in marine ecotourism must be contextualized within broader socio-political transformations, including climate change, biodiversity loss, and the Anthropocene discourse. These global challenges have exposed the limitations of human-centered governance and have fueled interest in relational ontologies that emphasize interdependence and multispecies justice (Latour, 2018). In marine contexts, posthumanist thinking encourages the reimagining of governance frameworks to include non-human stakeholders and to value the intrinsic rights of marine ecosystems (Cisneros-Montemayor et al., 2013; Lusseau & Higham, 2004; Monz et al., 2013). These theoretical insights have practical implications for marine ecotourism operators, policymakers, and conservationists, who must increasingly navigate ethical dilemmas and evolving public expectations. Thus, understanding how posthumanist perspectives are represented and operationalized in academic literature can offer valuable guidance for shaping future policies and practices in marine ecotourism.

In addition to its theoretical significance, a bibliometric analysis of posthumanism in marine ecotourism contributes to the strategic development of research agendas and academic collaboration (AlShehhi et al., 2022; TUTAR et al., 2023). As funding agencies and academic institutions seek to support interdisciplinary and impactful research, it is essential to map where scholarly energy is currently concentrated and where intellectual blind spots exist (Nazaruddin et al., 2023; Sreenivasan & Suresh, 2023). By identifying influential authors, institutions, and journals, this study can inform scholarly networks and enhance research visibility. Moreover, it allows for a critical reflection on how knowledge production about marine ecotourism and posthumanism is geographically and institutionally distributed, potentially revealing patterns of epistemic dominance or marginalization (Connell, 2007). Ultimately, this comprehensive

mapping provides a foundation for more inclusive, ethical, and innovative future research in the evolving landscape of marine ecotourism.

Despite the growing interest in posthumanist approaches within tourism and environmental studies, there is currently no comprehensive bibliometric analysis that specifically examines the intersection between posthumanism and marine ecotourism. Existing reviews tend to focus either on general trends in sustainable tourism or on philosophical critiques of anthropocentrism, without systematically analyzing the publication patterns, thematic clusters, and citation networks within this niche field. This absence of meta-analysis represents a significant gap in the literature, given the theoretical and practical relevance of posthumanist thought in reconfiguring human-nonhuman relations in marine tourism settings. As such, there is a need for a dedicated effort to collate, analyze, and interpret the academic contributions that shape this interdisciplinary space.

Given the proliferation of posthumanist discourse in the context of environmental studies and the growing ethical concerns in marine ecotourism, the lack of a systematic bibliometric assessment leaves scholars and practitioners without a clear understanding of how this emerging field has evolved. Without such a mapping, it is difficult to identify dominant paradigms, research frontiers, and opportunities for theoretical advancement or policy impact. This research addresses this problem by offering a structured bibliometric analysis that explores the intellectual architecture and developmental trajectory of posthumanist perspectives in marine ecotourism literature. The study aims to: (1) identify the most influential authors, institutions, and journals; (2) examine co-authorship and citation networks; (3) uncover key research themes and their evolution over time; and (4) highlight research gaps and future directions.

Methods

Design of Study

This study employs a quantitative bibliometric analysis to explore the intellectual structure and evolution of scholarly literature at the intersection of posthumanism and marine ecotourism. Bibliometric analysis provides a systematic and replicable method for evaluating large volumes of scientific publications through quantitative techniques such as citation analysis, co-authorship analysis, keyword co-occurrence, and co-citation analysis (Donthu et al., 2021). The use of bibliometric tools allows researchers to identify influential publications, track thematic developments, and map research networks over time.

Data Source

The bibliometric data for this study were extracted exclusively from the Scopus database, which is one of the most comprehensive and widely recognized sources of peer-reviewed academic literature across diverse disciplines. Scopus was selected due to its extensive journal coverage, high indexing standards, and compatibility with bibliometric software such as VOSviewer. The database includes journals, conference proceedings, books, and book chapters, ensuring a wide representation of scholarly output.

Search Strategy

To retrieve relevant publications, a structured search query was developed to capture literature that intersects both posthumanism and marine ecotourism. The following Boolean search string was applied to the Scopus advanced search interface, targeting article titles, abstracts, and keywords: (TITLE-ABS-KEY("posthumanism" OR "post-humanism" OR "posthumanist")

AND (TITLE-ABS-KEY("marine ecotourism" OR "marine tourism" OR "coastal tourism" OR "ocean tourism") The search was conducted in March 2025, and it covered all available years up to and including 2024. No language restrictions were applied, but only documents indexed in Scopus were considered.

Inclusion and Exclusion Criteria

To ensure the relevance and scholarly quality of the dataset, a clear set of inclusion and exclusion criteria was established. Publications were included if they explicitly discussed themes related to posthumanism in the context of marine ecotourism or related areas such as coastal and oceanic tourism. Only peer-reviewed sources such as journal articles, conference proceedings, and book chapters were considered. Furthermore, each publication was required to have complete metadata, including an abstract and author-provided keywords, to support keyword co-occurrence and thematic mapping in the bibliometric analysis. Conversely, articles that merely mentioned posthumanism or marine ecotourism in passing without in-depth analysis were excluded to maintain the analytical focus. Editorials, book reviews, opinion pieces, and other non-peer-reviewed documents were also omitted. Duplicates and any retracted publications were carefully removed during the data-cleaning process.

Bibliometric Mapping and Visualization using VOSviewer

VOSviewer is a specialized software tool developed for constructing and visualizing bibliometric maps, enabling researchers to explore the intellectual structure of a research field (Abbas et al., 2021; Rudi et al., 2024). It supports a range of analytical functions including co-authorship analysis, which identifies collaboration patterns among authors, institutions, and countries, and co-occurrence analysis, which examines the frequency and relational patterns among keywords to reveal thematic trends. Additionally, citation analysis is employed to highlight the most influential articles, authors, and journals based on citation counts, while bibliographic coupling and co-citation analysis uncover the intellectual linkages and shared foundations among scholarly publications.
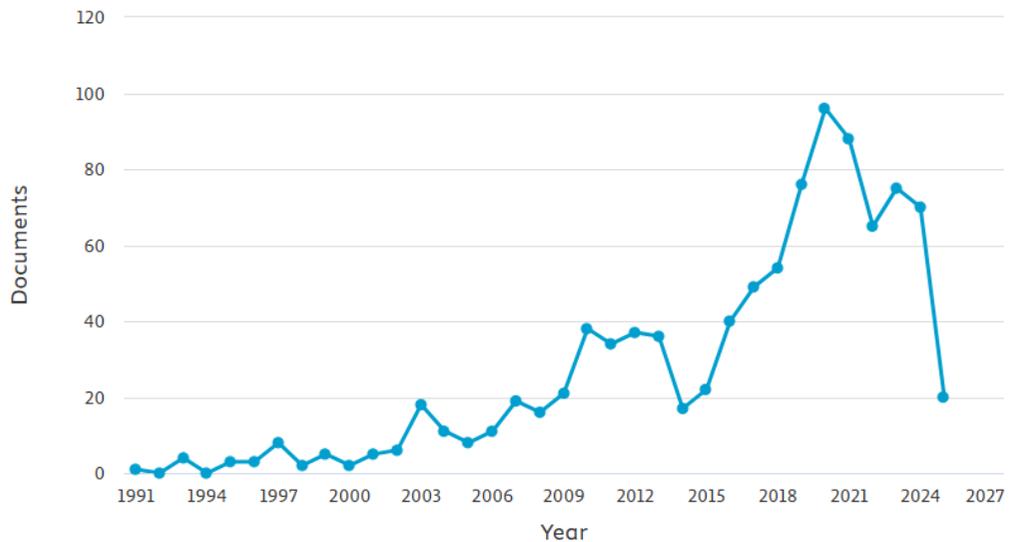
Result and Discussion

Figure 1. Documents by Year
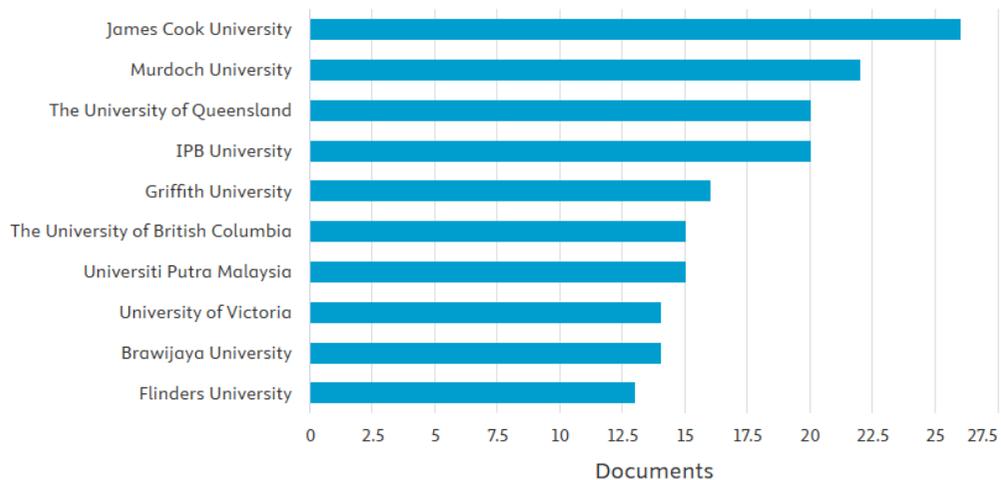
Source: Scopus Database, 2025

Figure 2. Documents by Afiliation

Source: Scopus Database, 2025

The first image displays a line graph depicting the annual number of academic publications from 1991 to 2025. The trend demonstrates a slow but steady increase in the number of documents from 1991 until around 2010, followed by a significant surge from 2015 onwards, peaking in 2020 with nearly 100 documents. This peak likely indicates a growing academic interest in the topic, possibly driven by emerging global challenges or policy shifts. However, the number of publications sees a steep decline post-2020, dropping sharply in 2025. This sharp fall could be

due to incomplete data for the final year or a genuine reduction in research activity. The first image displays a line graph depicting the annual number of academic publications from 1991 to 2025. The trend demonstrates a slow but steady increase in the number of documents from 1991 until around 2010, followed by a significant surge from 2015 onwards, peaking in 2020 with nearly 100 documents. This peak likely indicates a growing academic interest in the topic, possibly driven by emerging global challenges or policy shifts. However, the number of publications sees a steep decline post-2020, dropping sharply in 2025. This sharp fall could be due to incomplete data for the final year or a genuine reduction in research activity.

The second image is a horizontal bar chart that ranks institutions by the number of documents they have published on the subject. James Cook University leads with the highest output, followed by Murdoch University and The University of Queensland. Other prominent contributors include IPB University, Griffith University, and The University of British Columbia. The presence of universities from Australia, Indonesia, Malaysia, and Canada indicates a geographically diverse research interest, with Australia appearing particularly dominant. This distribution suggests strong regional engagement in the field, particularly from institutions located in the Asia-Pacific region.

Keyword Co-Occurrence Network Visualization

Figure 3. Keyword Network Visualization

Source: Data Processed, 2025

The visualization illustrates a keyword co-occurrence network representing the thematic structure of research at the intersection of posthumanism and marine ecotourism. Central to the network is the keyword posthumanism, which appears prominently in green and is strongly linked with terms like ecotourism, biodiversity, wildlife ecotourism, and multispecies livelihoods. This positioning suggests that posthumanist discourse is deeply embedded in discussions around ecological interdependence, multispecies interactions, and conservation

ethics within the tourism context. The emphasis on these themes reflects a growing scholarly interest in decentering the human subject in marine and wildlife tourism narratives, promoting a more inclusive and ethically attuned ecological worldview.

The cluster surrounding ecotourism (in red) reveals another thematic grouping, focused on sustainability and environmental governance. Keywords such as sustainable tourism, wildlife management, sustainable development, and nature-society relations indicate a conventional yet evolving concern for managing human-nature relationships through responsible tourism practices. The close proximity and strong linkage between ecotourism and posthumanism suggest a conceptual bridge where ecotourism is being re-evaluated through the lens of posthuman ethics, potentially challenging anthropocentric paradigms and reimagining tourism as a multispecies engagement.

A smaller but distinct blue cluster emerges around keywords like animal welfare and tourist attraction. This grouping suggests an alternative discourse stream where ethical considerations regarding nonhuman well-being in tourism settings are gaining visibility. Although more peripheral compared to the green and red clusters, this area points to an important intersection between tourism appeal and ethical obligations toward animals, echoing posthuman concerns about the moral status of nonhuman actors in leisure and conservation contexts.

Finally, the network's interconnectivity reveals an increasingly interdisciplinary and integrated field. The presence of terms like endangered species, nature conservation, and biodiversity highlights the confluence of conservation biology, ethical theory, and tourism studies. VOSviewer's visual clustering thus reflects a dynamic scholarly landscape where posthumanism is no longer marginal but central to emerging discussions about the future of marine ecotourism, ethics, and sustainable development. This trend underscores the importance of rethinking marine ecotourism not merely as a form of human recreation, but as a complex, ethically charged interaction between species, systems, and environments.
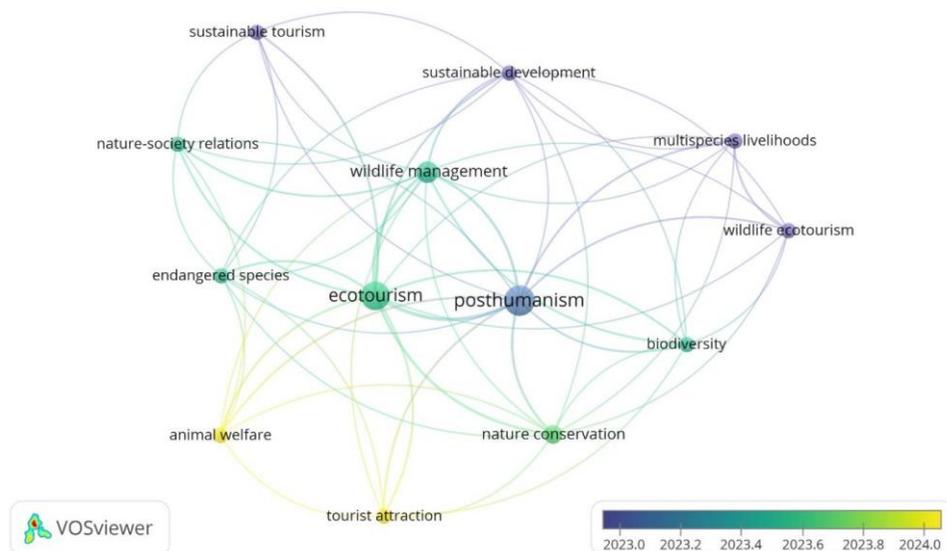

Figure 4. Keyword Overlay Visualization

Source: Data Processed by Author, 2025

This overlay visualization shows the temporal evolution of research themes connecting posthumanism and marine ecotourism from 2023 to early 2024. The color gradient (from dark blue (earlier publications) to yellow (more recent)) indicates the average publication year for each keyword. Central keywords like posthumanism and ecotourism are shaded in darker blue, signifying that these core concepts have been established earlier within the dataset and continue to act as thematic anchors in the field. In contrast, keywords such as animal welfare and tourist attraction are represented in yellow, indicating a shift toward more recent scholarly attention. These emerging terms suggest a growing interest in ethical dimensions and the experiential aspects of tourism, possibly driven by contemporary debates around multispecies ethics and the role of animals in tourism experiences. The focus on animal welfare, in particular, aligns closely with posthumanist critiques that advocate for nonhuman agency and care in tourism discourse. Meanwhile, terms like wildlife ecotourism, sustainable development, and multispecies livelihoods appear in shades of purple, suggesting that these themes are relatively newer but still gaining traction. Their position within the network reflects an evolving research direction that combines ecological sustainability with multispecies justice.
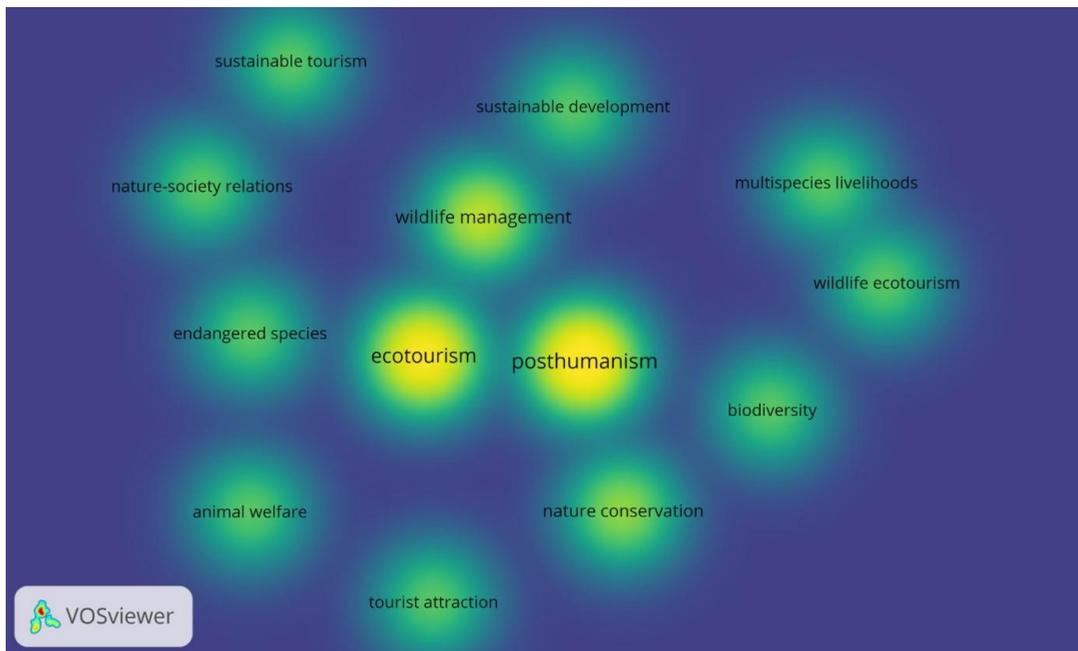

Figure 5. Keyword Density Visualization / Heatmap Visualization

Source: Data Processed by Author, 2025

This density visualization map illustrates the intensity and frequency of co-occurrence among key terms in the scholarly literature related to posthumanism and ecotourism. The colors represent density: yellow indicates areas with a high concentration of co-occurring terms, while green and blue represent areas with moderate and low densities, respectively. The brightest and most densely populated areas center around posthumanism and ecotourism, signaling that these are the most prominent and frequently discussed themes within the research field. Surrounding these central themes are clusters of related topics such as wildlife management, nature conservation, biodiversity, and sustainable development, which appear in green to yellow shades, suggesting significant but slightly less frequent co-occurrence. Meanwhile, concepts like

multispecies livelihoods, animal welfare, and tourist attraction are positioned further out in lower-density zones (green to blue), indicating emerging or more niche discussions.

Citation Analysis (Uncover the Top Cited Literature)

Citations	Author('s)	Sources	Title
321	(Sala & Giakoumi, 2018)	ICES Journal of Marine Science	No-take marine reserves are the most effective protected areas in the ocean
199	(Moreno & Becken, 2009)	Journal of Sustainable Tourism	A climate change vulnerability assessment methodology for coastal tourism
198	(Marcovaldi & Dei Marcovaldi, 1999)	Biological Conservation	Marine turtles of Brazil: The history and structure of Projeto TAMAR-IBAMA
188	(Vianna et al., 2012)	Biological Conservation	Socio-economic value and community benefits from shark-diving tourism in Palau: A sustainable use of reef shark populations
188	(Salafsky et al., 2001)	Conservation Biology	A systematic test of an enterprise strategy for community-based biodiversity conservation
176	(Cisneros-Montemayor et al., 2013)	ORYX	Global economic value of shark ecotourism: Implications for conservation
169	(Monz et al., 2013)	Frontiers in Ecology and the Environment	Recent advances in recreation ecology and the implications of different relationships between recreation use and ecological impacts
164	(Lusseau & Higham, 2004)	Tourism Management	Managing the impacts of dolphin-based tourism through the definition of critical habitats: The case of bottlenose dolphins (*Tursiops* spp.) in Doubtful Sound, New Zealand
161	(Cisneros-Montemayor & Sumaila, 2010)	Journal of Bioeconomics	A global estimate of benefits from ecosystem-based marine recreation: Potential impacts and implications for management
161	(Lück, 2003)	Ocean and Coastal Management	Education on marine mammal tours as agent for conservation - But do tourists want to be educated?

Table 1. Top Cited Literature

Source: Scopus Database, 2025
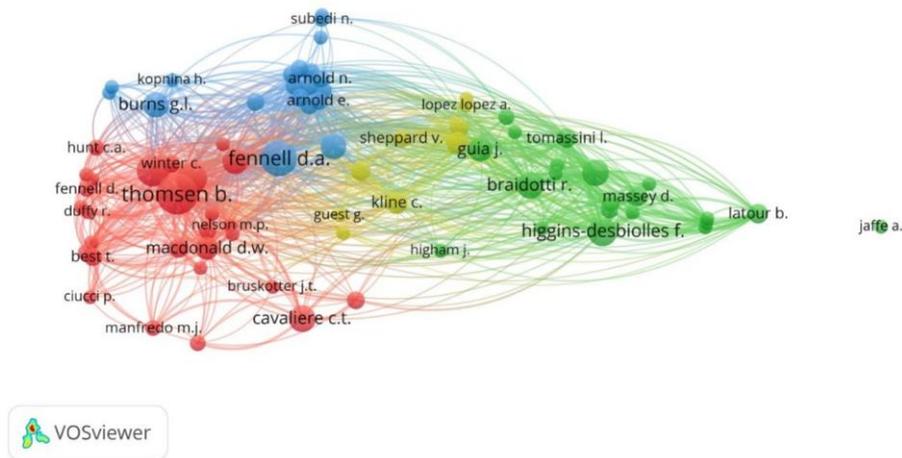
Co-Authorship Network Visualization

Figure 6. Author Visualization

Source: Data Processed by Author, 2025

This network visualization map presents the co-authorship or citation relationships among prominent scholars in the field related to ecotourism and posthumanism. The nodes represent individual authors, and the size of each node indicates the volume of their contributions or citations—larger nodes denote more influential authors. The different colors signify clusters of closely connected authors, suggesting shared thematic focus or frequent co-citations. For instance, Fennell D.A. acts as a central bridging figure, linking multiple clusters, with strong connections to authors like Thomsen B., Arnold N., and Guia J.. The green cluster on the right includes key posthumanist thinkers like Braidotti R., Higgins-Desbiolles F., and Latour B., indicating a distinct thematic grouping related to theoretical and philosophical approaches. Meanwhile, the red and blue clusters on the left represent more empirical or conservation-

focused scholars.

Figure 7. Country Visualization

Source: Data Processed by Author, 2025

This network visualization depicts the collaboration or citation relationships among countries involved in scholarly research, likely within the context of ecotourism, sustainability, or posthumanism. Each node represents a country, with the size reflecting its relative contribution to the literature (e.g., number of publications or citations). The United Kingdom emerges as a central hub, indicating its strong research output and extensive collaborative ties, particularly with Canada, Australia, and Austria. The green and blue clusters signify regional or thematic collaborations, with the UK linking North America and Oceania. On the other hand, Netherlands and Italy form a distinct red cluster, suggesting regional European collaboration with a more localized network. The visual separation between the UK-led cluster and the Netherlands-Italy pair implies a slight thematic or linguistic divergence in research focus, even as weak connections exist between them, hinting at occasional cross-border collaboration.

Discussion

This study explores the intellectual and geographical landscape of research in the field of posthumanism, ecotourism, and sustainability studies through bibliometric network analysis using VOSviewer. By examining author-level and country-level collaborations, we aim to uncover not only the most influential scholars and nations contributing to this evolving field but also the structural patterns that inform current academic discourse and research trajectories.

Overview of Clustering Patterns

The keyword network is organized into distinct clusters, each represented by different colors and indicating thematic groupings. These clusters highlight major intellectual currents and reveal

the relational positioning of keywords, suggesting which concepts are most central to scholarly conversations. For instance, the yellow cluster, which includes keywords like "ecotourism," "conservation," "environmental sustainability," and "protected areas," represents the foundational ecological and environmental science perspective in the field. These terms are interlinked with management and conservation practices, emphasizing the preservation of biodiversity, habitat protection, and the regulation of human activities in nature-based tourism destinations. In contrast, the red cluster incorporates critical and philosophical terms such as "posthumanism," "ethics," "subjectivity," "agency," "nonhuman," and "decolonization." This cluster reflects the critical theory and post-structuralist orientation, focusing on reconceptualizing human-nature relationships, critiquing anthropocentrism, and integrating ontological multiplicity. The appearance of "Rosi Braidotti" as a keyword here also signals the influence of specific theoretical figures in shaping this discourse. The blue cluster appears to capture more socio-cultural and political themes, with keywords like "sustainability," "indigenous tourism," "community-based tourism," and "justice." This grouping points to the increasing prominence of participatory, place-based, and socially embedded perspectives in sustainable tourism discourse. It also connects with broader sustainability science, which now incorporates social equity and power dynamics as critical considerations.

Central Keywords and Their Significance

The size of each keyword node indicates its frequency and centrality in the literature. Unsurprisingly, "ecotourism" is one of the most dominant keywords, reflecting its historical roots and continued importance as a core concept. However, the co-occurrence with terms such as "posthumanism," "ethics," and "nonhuman agency" suggests that the meaning of ecotourism is undergoing significant re-theorization. The presence of "posthumanism" as a highly connected node reinforces the growing scholarly interest in moving beyond the traditional human-centric paradigm. This conceptual shift opens up new ethical, philosophical, and ontological considerations in tourism studies, such as the moral rights of animals, land, or ecological systems, and the recognition of more-than-human worlds as legitimate stakeholders. Another crucial keyword is "Anthropocene," which acts as both a descriptive and normative concept. It underscores the era of human-induced environmental change while also inviting critical reflection on human exceptionalism. Its connection to "climate change," "ethics," and "resilience" indicates that scholars are not only diagnosing environmental crises but also exploring ethical frameworks to navigate them. Interestingly, "indigenous tourism" and "community-based tourism" are prominently situated within the network, revealing a concern with local knowledge systems, empowerment, and participatory governance. These keywords signal the need to decolonize tourism practices and foreground alternative epistemologies that honor land-based ontologies and intergenerational stewardship.

Thematic Convergence and Interdisciplinary

One of the most striking findings of the keyword co-occurrence map is the deep thematic convergence between ecology, critical theory, and political practice. This fusion indicates a robust interdisciplinarity in the field, where natural sciences, humanities, and social sciences are increasingly co-producing knowledge. The interlinkages between "biodiversity" and "ethics," or between "conservation" and "decolonization," reflect this blurring of disciplinary boundaries. For example, conservation is no longer viewed solely as a technical endeavor but also as an ethical and political act, raising questions about whose nature is being conserved, who benefits, and at what cost. This convergence is especially important in the context of posthumanist

ecotourism, where the goal is not merely to minimize ecological footprints but to reconfigure the ontological status of nature, humans, and technology. Here, tourism becomes a site of affective, sensory, and ethical experimentation—one that can either reinforce or challenge hegemonic worldviews.

Author Collaboration Network

The co-authorship network highlights several key insights into the scholarly dynamics shaping this field. The visualization clearly shows multiple clusters, each representing a community of researchers with overlapping interests or mutual citation patterns. Among them, Fennell D.A. emerges as a central figure, positioned at the intersection of several clusters (colored in yellow), and acting as a bridging node that connects disparate academic communities. This centrality implies Fennell's pivotal role in integrating diverse perspectives, likely across subfields such as ethical tourism, ecophilosophy, and policy frameworks within ecotourism.

Other clusters also reveal thematic concentrations. For example, the red cluster surrounding Thomsen B., MacDonald D.W., and Cavaliere C.T. seems to reflect a strong focus on conservation-based and anthropocentric critique of tourism. These researchers likely align with a more critical or activist approach to sustainability, often challenging mainstream capitalist or extractive practices in tourism. The green cluster, including Higgins-Desbiolles F., Braidotti R., and Massey D., signifies an emerging or established stream of thought that merges posthumanist theory with tourism, integrating voices from feminist theory, political ecology, and postcolonial critique. Notably, some researchers such as Jaffe A. appear as isolates or minimally connected to the central network. This may suggest a niche or emergent scholarly focus or methodological divergence. It could also reflect a temporal lag, where the integration of certain theoretical lenses (e.g., decolonial or indigenous perspectives) into mainstream tourism discourse is still developing.

Country-Level Analysis: Geopolitics of Knowledge Production

The last visualization presents a country-level collaboration network, which offers a different but complementary view of research dynamics. The United Kingdom is the most central and well-connected country in the network, highlighting its strong role in leading and coordinating international research projects or collaborative publications. Its connections with Canada and Australia further reinforce the dominance of English-speaking, Global North countries in shaping the theoretical and empirical contours of this field. This centrality could be attributed to several factors: access to research funding, established academic institutions, and historical ties that facilitate academic mobility. However, it also raises critical concerns about the epistemic hegemony of certain regions. The concentration of knowledge production in the Global North may marginalize perspectives from the Global South, which are crucial when studying topics such as indigenous ecotourism, environmental justice, and postcolonial ecological frameworks.

Interestingly, Netherlands and Italy form a separate red cluster, indicating regional collaboration more centered within continental Europe. While they are connected to the UK, the linkage is weak, possibly due to linguistic differences, funding boundaries, or varying theoretical traditions. The Netherlands' visibility may be driven by the presence of prominent thinkers like Rosi Braidotti, whose contributions to posthumanism have deeply influenced the conceptual underpinnings of ecotourism theory. What's striking is the absence or underrepresentation of countries from Asia, Africa, and Latin America. While researchers from these regions may indeed be contributing, their lack of centrality in the co-authorship map suggests they are either

being under-cited or participating in networks that are not as integrated into the mainstream bibliometric data. This reflects a broader challenge in academia, publication access, and knowledge validation.

Theoretical Implications

The visualization confirms that the intersection of ecotourism and posthumanism is becoming a transdisciplinary space where philosophy, environmental science, sociology, and political ecology converge. The clustering patterns reflect theoretical pluralism, which is both a strength and a challenge. For instance, the integration of posthumanist theory, as evidenced by the prominence of thinkers like Braidotti and Higgins-Desbiolles, invites a critical shift away from anthropocentric sustainability models toward more inclusive ontologies. These perspectives call for the decentering of the human subject and the recognition of nonhuman agency in ecological systems, transforming the way we conceive of "responsible tourism" or "sustainable destinations."

At the same time, the enduring influence of conservationist and management-oriented scholars suggests that traditional models still hold sway, particularly in policy and development circles. The field appears to be at a crossroads, negotiating between normative, managerial paradigms and critical, deconstructive approaches. This pluralism has the potential to foster rich theoretical debates, but it also requires deliberate effort to bridge epistemological divides. Researchers must actively seek cross-disciplinary literacy and remain open to reimagining foundational assumptions about tourism, nature, and the subjectivity of travelers and host communities.

Practical and Policy Implications

From a practical standpoint, this keyword network can inform curriculum development, policy design, and destination planning. Tourism educators can draw on this map to develop transdisciplinary modules that incorporate ecological science, ethics, philosophy, and indigenous studies. Similarly, policymakers can use these insights to create ethical guidelines for tourism development, ensuring that sustainability is not just a technical checklist but a holistic, justice-oriented process. Furthermore, tourism operators and NGOs can benefit from this emerging body of knowledge by rethinking their engagement with local communities, ecosystems, and tourists themselves. Concepts like "responsible tourism" and "relational sustainability" suggest more collaborative, respectful, and reflexive approaches to tourism planning and delivery.

Limitation and Future Research

While this study offers a robust visualization of collaboration patterns, several limitations must be acknowledged. First, bibliometric tools like VOSviewer are constrained by the data source, which tend to favor English-language and Global North publications. As a result, non-indexed, local, or indigenous knowledge may be excluded from the analysis, creating blind spots in our understanding of the field. Second, co-authorship and co-citation do not always reflect substantive collaboration or theoretical agreement. Authors may be linked due to shared terminology or institutional affiliations, but not necessarily shared values or methodologies. Future research could extend this analysis by incorporating qualitative mapping, such as thematic coding of publications, interviews with key scholars, or discourse analysis.

Conclusion

This study has illuminated the evolving landscape of scholarly discourse at the intersection of

posthumanism, ecotourism, and sustainability through a comprehensive bibliometric and keyword co-occurrence analysis. The findings reveal a dynamic and interdisciplinary field marked by a convergence of ecological science, ethical philosophy, critical theory, and socio-political concerns. Dominant themes such as conservation, nonhuman agency, decolonization, and the Anthropocene reflect a shift toward more inclusive, relational, and justice-oriented approaches to tourism. The visualization of keyword clusters highlights the growing influence of posthumanist thought in challenging anthropocentric paradigms and advocating for more-than-human perspectives. As global environmental challenges intensify, this intellectual transformation holds profound implications for research, policy, and practice. The study underscores the importance of integrating diverse epistemologies and ethical frameworks to reimagine tourism as a transformative, equitable, and ecologically attuned practice in the 21st century.

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