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Bibliometric Analysis of Insularity in the European Union

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Abstract: The conceptualization of insularity in the context of islands has been widely studied and debated, encompassing both geographical and identity aspects. The academic discussion on the definition of insularity and isolation in the context of islands remains a current topic, along with the economic, social, legal and environmental challenges faced by insular regions. This study aims to deepen the conceptual framework of insularity and structure its issues from various scientific perspectives through quantitative bibliometric analysis. Key focus areas and research gaps have been identified, including the need for enhanced economic policies, better marine resource management, more comprehensive urban development research and improved data on social and political issues. The conclusions emphasize the importance of prioritizing intervention areas and specific policies to address the unique challenges faced by insular regions in terms of sustainable development.

Keywords: insularity; islandness; island; bibliometric analysis; European Union

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1. Introduction

The conceptualization of insularity in the context of islands has been widely addressed. Initially, it has been defined as a combination of geographical conditions and the political, social, economic and cultural peripheralization of a region [1]. Other definitions imply a sense of identity connected, though not solely defined, by the physical dimensions of island life, such as the limitations imposed by water [2]. Regarding this etymological and conceptual perspective, both geographical isolation and identity isolation [3] constitute the concept of an island as an intensely multi-relational phenomenon, characterized by the constant interplay between islands as physical places and all the figures of thought associated with those places. In this sense, the academic discussion regarding the definition of the concepts of island, insularity and isolation or islandness [4] remains a current topic. Thus, the absence of a positive definition of an island leads to its reinterpretation as a "political interstice", which implies separation and connection [2], as well as the formulation of new concepts, such as "small insular space" [5,6].

From an institutional perspective, the REGI Research Committee [7] highlights the clear distinction between islands as geographical units and as regional/administrative territorial units, which complicates the collection and updating of statistical data. The ESPON program (European Observation Network for Territorial Development and Cohesion) defines insularity in the context of islands as the disconnection from the continent, either through the common characteristics of all islands regarding their small size in relation to the continent, remoteness and isolation, or a particular social identity, natural environment and culture [8].

On the other hand, it is essential to differentiate the definition of insularity from an environmental academic perspective, as this plays a crucial role in ecosystem development ([9], p. 200) and contributes to the unique endemic character of flora and fauna species present in island regions.

Regarding the challenges posed by insularity, these encompass transversal research areas. Economically, island regions exhibit high specialization and vulnerability in their economic structure, low levels of professional training and scarce public services [10]. Insularity implies a lack of critical mass (resources, consumers, workforce, land and infrastructure) to develop competitive economic activities and benefit from economies of scale, in addition to higher transportation costs for goods [7,8]. Furthermore, island regions show a higher degree of economic dependence on imports and exports [11], although the level of regional sovereignty is a determining factor in their import dependence ratio [12]. Specifically, findings on the economies of European islands suggest that those with better economic performance but higher vulnerability specialize in low value-added activities, such as tourism, whereas others depend on exogenous influences, such as tax-free zones, oil extraction or a developed public sector [13].

Insularity exerts a significant impact on the social sphere of a region. In this context, local governance is influenced by the density of social ties and community participation, factors that tend to manifest robustly. This phenomenon facilitates efficient decision-making and greater public involvement in both the development and implementation of public policies. The social challenges of European islands vary according to their levels of depopulation and aging, highlighting difficulties in providing essential public services, dependence on a single economic sector and high carrying capacity in some Mediterranean islands, low education levels, unemployment and the influx of large numbers of migrants to some islands [7,14].

Therefore, in a legal context, an insularity-based approach is proposed for the development of international human rights law in the European Union [15]. Existing European legislation differentiates between two fundamental categories: insular regions and outermost regions. Recognition as an outermost region is established in Articles 107, 158, 349 and 355 of the TFEU (Treaty on the Functioning of the European Union) and the Permanent Statute for Outermost Regions, which serve as the legal basis for applying special subsidy programs for the Canary Islands, Azores, Madeira and Réunion. Although insularity has been recognized in the EU cohesion policy since the Treaty of Lisbon in 2009, in Article 174 of the TFEU, its statistical and legal definition is imprecise and contradictory, marked by the absence of common geo-economic criteria. This complicates the implementation of common policies and funding to address the challenges of insularity [10,16].

In 2022, the need for measures to compensate for the costs of insularity led to the majority approval in the European Parliament of the report "Islands and Cohesion Policy: Current Situation and Future Challenges". This included the incorporation of the following objectives into the EU members' agenda: the inclusion of the insular dimension or "islands proofing" and the development of a European islands' strategy.

From an environmental perspective, the fragility of island ecosystems is compounded by their dependence on fossil fuels and energy imports, due to their disconnection from transportation and energy networks. Particularly, especially in the case of Mediterranean islands, the natural and cultural heritage is exposed to significant risks due to climate change, such as droughts, water erosion, floods, or soil salinity [14]. The economic and social development problems faced by European islands, according to [17], are exacerbated by environmental issues, especially those caused by human activities. The lack of protection of the natural environment against external pressures, such as the high level of artificialization observed on many islands, constitutes another environmental problem [8,17].

In parallel, it is worth noting the vulnerability of islands to external shocks, particularly to trends such as globalization, environmental degradation and climate change. The level of exposure to these challenges depends on specific contextual factors, such as size, population, location, urban provision and the institutional status of the island [8,11].

The definition and conceptualization of insularity constitute a constantly evolving area of study over time. As noted by [18], the categorization of a territory as an island and the conceptualization of insularity must be differentiated. On one hand, very small islands, perceived as islets, or those categorized as continents, do not belong to the island

categorization. Therefore, EUROSTAT defines island regions at NUTS3 level as islands or groups of islands that have the following: (1) a minimum area of 1 km^2; (2) a minimum distance of 1 km between the island and the mainland; (3) a permanent resident population of more than 50 inhabitants; and (4) no fixed connection (bridge, tunnel, causeway) between the island and the mainland. On the other hand, the insular dimension incorporates two differentiated concepts in academic literature, parallel to the distinction between space and territory: "islandness", as the sum of representations and experiences that structure the territory and inhabitants of the island; and insularity, as a geographical and physical characteristic that defines an island space [3,6]. Thus, [6] discusses the intrinsic difficulty of a universal definition of insularity and proposes a categorization of seven situations, ranging from hypo-insularity to hyper-insularity or "double insularity". Consequently, the conceptualization of the concepts of island and insularity presents an opportunity for research, concerning the ontological analysis of these phenomena [6,19].

It is relevant to highlight that, at the European level, island regions represent 184,200 km^2 of 11 Member States and 20.6 million inhabitants (4.6% of the total EU population). Looking at their legal and political status, we find 6.4 million inhabitants from the three EU island states (Ireland, Malta and Cyprus); 4.5 million inhabitants from the outermost island regions (eight regions belonging to France, Portugal and Spain); and 9.7 million inhabitants from the island regions of seven Member States.

Furthermore, the challenges faced by European islands are linked to the Sustainable Development Goals (SDGs) proposed in the United Nations' agenda for 2030 [20]. The Agenda 2030 establishes a comprehensive framework for addressing the most urgent global challenges, among which insularity emerges as a cross-cutting theme. Specifically, it is related to five main SDGs: end poverty (SDG 1) due to limited access to resources and economic burdens [21,22]; affordable and clean energy (SDG 7), in relation to dependence on imported energy sources [23]; climate action (SDG 13), given the special vulnerability of islands to the impacts of climate change and the fragility of their ecosystems [24]; life below water (SDG 14), concerning threats such as overfishing, pollution and climate change facing the marine ecosystems of islands [25]; and life on land (SDG 15), referring to the fragility of terrestrial island ecosystems [26].

Following the need to delve deeper into the study of islands [27], this proposal aims to address the bibliometric research gap regarding insularity from geographical, environmental, economic and social perspectives. The conceptualization and definition of the concept have been worked on, as authors such as [28] have analyzed the intersection between law, geography and fiction in the context of islands and insularity from a legal standpoint. The redefinition of the island as a small island space has also been proposed, along with different typologies of insularity and "islandness" or isolation from a geopolitical perspective [2,6]. Other related concepts, such as remoteness and isolation, have been delineated from a linguistic perspective [3]. Furthermore, in similar studies [29], the concepts of "island landscape" and "small island" have been defined from an ethnographic and geographical viewpoint. From a geopolitical sense, the concept of island as a "political interstice" [30] has been debated. In parallel, recent research has proposed innovative statistical methodology for measuring insularity [18]. Other works include surveys as a review of theoretical and empirical evidence on the impact of insularity on regional economic development [31]. The most recent bibliometric analysis explores research on tourist clusters and island economies [32].

Thus, the objectives of this analysis are to structure and delve into the conceptual framework of insularity and, on the other hand, into the challenges and issues facing island regions in the European Union from a scientific perspective. The aforementioned points, covering conceptualization, challenges and the relevance of island regions within the European Union, form the justified basis for conducting this research. The multidisciplinary and cross-cutting nature of the analyzed topic requires an objective approach, which is why a bibliometric review of scientific production is proposed as an analytical tool. This

serves as a fundamental starting point to understand the various issues raised regarding European insularity in terms of economic, social and territorial development.

This work is structured as follows: firstly, the sources of information and methodology of the bibliometric analysis are detailed; secondly, the results obtained are presented and analyzed; and finally, this study's conclusions are presented.

2. Methodology

The retrieval of research articles was carried out by conducting a parallel search using the scientific information meta-search engines Web of Science (WoS) and Scopus [33]. From the keyword search on these platforms, the databases for bibliometric analysis were obtained. Based on the broad scope of the search, articles exhibiting a greater relevance to the issues of insularity in the context of the European Union were selected. Further exploration into the main themes and prominent authors in the field of insularity was conducted using the Bibliometrix R package [34], under RStudio 2024.04.2 software, build 764 version. The methodology employed in the bibliometric analysis process comprised the following sections, in parallel with WoS and Scopus: (1) definition of selection criteria, (2) data importation, (3) selection of relevant information.

1. Definition of selection criteria

The query conducted in WoS was filtered according to the parameters detailed below:

- Database: the search was restricted to articles in the Web of Science Core Collection, the world's leading citation database. It contains records of articles from top impact journals worldwide, including open-access journals, conference proceedings and books.
- Keyword selection: Keywords such as insularity, islandness, outermost region, insularity indicator, islandness indicator, insularity cost, islandness cost, insular economy, island economy, islandness measure, insularity measure, small island developing states, archipelago, small island(s), island jurisdiction(s) and small island states were included. It is noteworthy to clarify that terms such as "urban heat island" and "heat island" were excluded from the search due to their potential to distort results and lack of relevance to the studied topic. A total of 111,305 results were obtained.
- Document type: results were limited to the article type, which included research reports on original works (research articles, brief communications, case reports, technical notes, chronology and full papers published in a journal and/or presented at a symposium or conference). A total of 98.218 results were obtained.
- Research scope (Web of Science category): Web of Science categories are assigned at the journal level and are applied to all items within that journal. Each journal in the Web of Science Core Collection has one or more categories assigned, up to a maximum of 6. The selection of these categories is based on various criteria, such as the journal's subject and scope, author and editorial board affiliations, funding agencies, cited references, citation relationships and other considerations, such as journal sponsorship and categorization in other bibliographic databases. The selected categories were Environmental Sciences, Environmental Studies, Ecology, Economics, Geography, Hospitality, Leisure, Sport Tourism, Water Resources, Physical Geography, Energy Fuels, Social Issues, Social Sciences Interdisciplinary, Sociology, International Relations, Regional Urban Planning, Urban Studies, Development Studies, Political Science, Social Sciences Mathematical Methods, Social Work, Law, Public Administration, Demography, Transportation. A total of 27,313 results were obtained.
- Meso-level citation topics: These are thematic groupings aimed at identifying clusters of closely related articles or revealing the underlying structure of a research area. Meso-level citation topics allow for the examination of the development and evolution of specific research topics over time, identification of influential articles and observation of collaboration patterns or interdisciplinary connections. The selected categories included Hospitality, Leisure, Sport and Tourism, Human Geography, Climate

Change, Sustainability Science, Economics, Political Science, Management, Anthropology, Ocean Dynamics, Oceanography, Meteorology and Atmospheric Sciences, Herbicides, Pesticides and Ground Poisoning, Soil Science, Economic Theory, Agricultural Policy, Environmental Sciences, Water Resources, Transportation, Gender and Sexuality Studies, Law, Supply Chain and Logistics, Energy and Fuels, Healthcare Policy. A total of 8,026 results were obtained.

- Micro-level citation topics: The micro-level of citation topics examines individual articles, authors, or specific ideas in detail. At this level, citation analysis can reveal the direct impact of a particular publication on subsequent research or identify the specific ideas or methods that have been most influential in a particular field. Micro-level citation analysis can also help track the development of individual researchers' careers or the progression of specific research ideas. The selected categories included Tourism, Climate Change Adaptation, Island Studies, Renewable Energy, Agglomeration Economies, Sea Level Rise, Environmental Kuznets Curve, Gentrification, International Relations, Economic Growth, Immigration, Anthropology, Monetary Policy, Microplastics, Municipal Solid Waste, International Trade, Contingent Valuation, Urban Agriculture, World Trade Organization, Water Governance, Sharing Economy, Tax Evasion, Data Envelopment Analysis, Wages, Airlines, Public Administration, House Prices, European Union, Supply Chain, Internationalization, Trade Unions, Geostatistics. A total of 4,048 results were obtained.
- Limitation of results to the European context: the previously defined search (query #1) has been replicated with the restriction of results to the European Union. The query used was as follows: ((#1) AND ALL = (european union)). A total of 228 results were obtained.

The query conducted in Scopus was filtered according to the parameters detailed below:

- Database: The search was conducted focusing on articles available as Gold, Green, Bronze and Hybrid Gold. These filters include records from high-impact journals, open-access journals and hybrid journals. This approach ensures that the selection criteria and the representativeness of the publications are comparable with the World of Science Core Collection database.
- Keyword selection: keywords such as insularity, islandness, outermost region, insularity indicator, islandness indicator, insularity cost, islandness cost, insular economy, island economy, islandness measure, insularity measure, small island developing states, archipelago, small island(s), island jurisdiction(s) and small island states were included. It is noteworthy to clarify that terms such as "urban heat island" and "heat island" were excluded from the search due to their potential to distort results and lack of relevance to the studied topic. A total of 35,221 results were obtained.
- Document type: Results were limited to article type. This category included articles in peer-reviewed journals, case reports, technical notes and brief communications. A total of 31,061 results were obtained.
- Research scope: The selected categories were limited to Social Sciences, Environmental Sciences and Economics. A total of 10,940 results were obtained.
- Limitation of results to the European context: The previously defined search (query #1) was replicated with the restriction of results to the European Union. The query used was as follows: ((#1) AND ALL = (european union)). A total of 559 results were obtained.
- It is noteworthy to detail that no language filter was applied, meaning that articles in other languages than English were included in the study.

2. Data importation:

Both databases were merged to process the information jointly using Biblioshiny package functions. In this process, only relevant data from Web of Science (WoS) were retained in case of duplicate references. A total of 1601 duplicates from the global search and

50 duplicates from the EU search were removed. The results of the final data importation (5 July 2024) are presented in detail in Tables 1 and 2, corresponding to the global and European-level searches, respectively.

Table 1. Final references from WoS and Scopus. Global search.

Main Information about Data	
Timespan	1865:2024
Sources (journals, books, etc.)	2743
Documents	13,387
Annual growth rate %	4.12
Document average age	8.14
Average citations per doc.	19.5
DOCUMENT CONTENTS	
Keywords plus (ID)	27,927
Author's keywords (DE)	34,724
AUTHORS	
Authors	45,286
Authors of single-authored docs	2337
AUTHORS COLLABORATION	
Single-authored docs.	2699
Co-authors per doc.	4.2
International co-authorships %	30.8
DOCUMENT TYPES	
article	13,143
article: book chapter	105
article: early access	30
article: proceedings paper	109

Table 2. Final references from WoS and Scopus. European Union search.

Main Information about Data	
Timespan	1996:2024
Sources (journals, books, etc.)	403
Documents	732
Annual growth rate %	14.47
Document average age	5.2
Average citations per doc	17.9
DOCUMENT CONTENTS	
Keywords plus (ID)	3479
Author's keywords (DE)	2879
AUTHORS	
Authors	3090
Authors of single-authored docs	125
AUTHORS COLLABORATION	
Single-authored docs.	135
Co-authors per doc.	4.66
International co-authorships %	27.6
DOCUMENT TYPES	
article	729
article: book chapter	1
article: proceedings paper	2

3. Selection of relevant information:

The explanation of the selected parameters in the Biblioshiny reports [34] is divided into the following sections:

- Evolution of scientific production: this section presents the total number and average of articles published per year.

- Academic journals and main authors: the total number of citations (TCs), total number of publications (NP) and year of publication commencement (PY_start) were obtained. Additionally, the following metrics were included:
    1. h-index: metric at the author level that attempts to measure both the productivity and citation impact of a scientist or scholar's publications [35]. The index is based on the set of the scientist's most cited documents and the number of citations they have received in other publications.
    2. m-index: defined as H/n, where H is the h-index and n is the number of years since the scientist's (journal's) first article was published.
    3. g-index: presented as an improvement of the h-index to measure the overall citation performance of a set of articles.
- Co-citation analysis: This analysis focuses on identifying intellectual connections between scientific documents through the citations they share. When two documents are cited by a third document, a co-citation between the first two occurs.
- Countries and institutions: the number of articles published per country of the author, the degree of international collaboration of each country based on SCP (single country publication) and MCP (multiple countries publication) indices and the number of articles published per university were obtained.
- Conceptual structure:
    1. Yearly evolution of keywords by author (trend topics).
    2. Thematic map: Each cluster or theme is represented on a thematic map, where centrality and density are measures of relevance and development of the theme, respectively. More specifically, centrality is the degree of correlation among different topics; density measures the cohesiveness among the nodes [36,37]. Based on these two parameters, themes are divided into emerging or declining (low centrality, low density), basic and transversal (high centrality, low density), specialized and isolated (low centrality, high density) and driving or core themes (high centrality, high density). It is worth noting that, in some cases, synonyms have been grouped to facilitate grouping into coherent clusters (e.g., small island developing state and small island developing states). The applied methodology involves applying a clustering algorithm to a network of keywords to highlight the different themes of a given domain. The walktrap algorithm is highly regarded in bibliometric analysis for identifying tightly-knit groups within large networks, since it uses random walks to detect clusters, enhancing its efficiency in managing complex networks compared to other methods [38,39].
    3. Factorial analysis: clustering of keywords by author into clusters (using the walktrap algorithm) to identify underlying patterns and thematic structures within the academic literature on insularity.
    4. Co-occurrence analysis: Examines the frequency with which two or more keywords appear together in scientific documents, under the premise that they are thematically related. It is used to identify patterns of association between concepts and to map the thematic structure of a set of documents.

3. Results and Discussion

3.1. Evolution of Scientific Production

In this section, the results at the global level (Figure 1) and European level (Figure 2) are presented, aiming to identify common aspects in the evolution of scientific production. The number of published articles shows a positive average growth during the analyzed period, both globally and in Europe. From the year 2019 onwards, there has been a significant increase in the number of articles, highlighting the significance of the concept of insularity in the academic context. Finally, it is worth noting that the annual average of citations shows a steady trend in the global database, while it presents an irregular behavior in the scientific production at a European level.

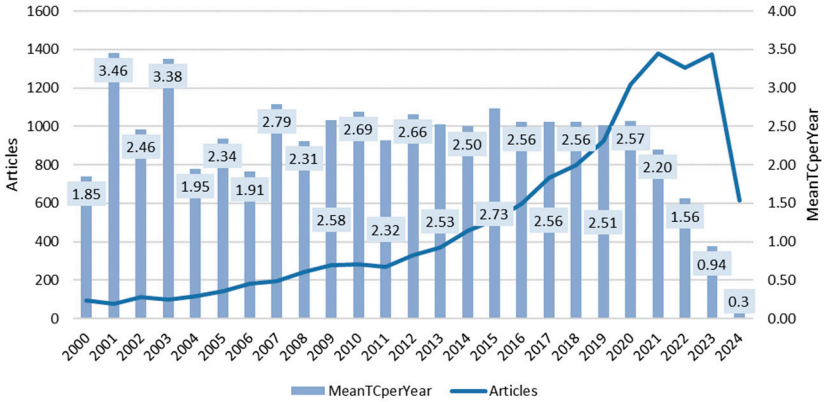

Figure 1. Evolution of scientific production at a global level. Own elaboration from Biblioshiny-imported database.

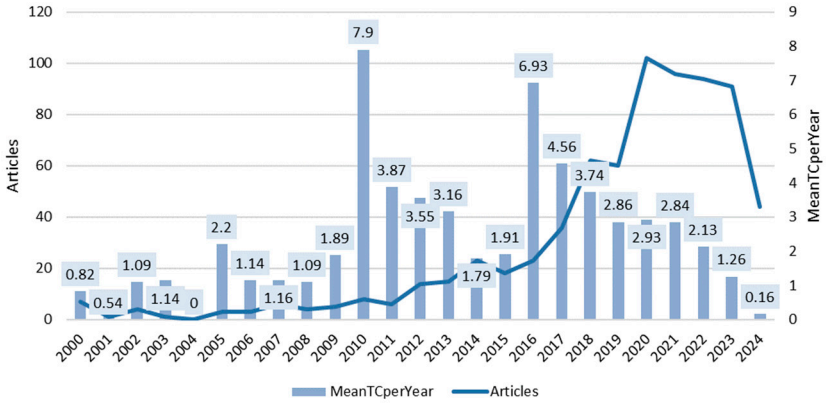

Figure 2. Evolution of scientific production at a European level. Own elaboration from Biblioshiny-imported database.

3.2. Academic Network

This section presents the main journals, authors, institutions and countries involved in the study of insularity on islands.

3.2.1. Production by Academic Journals

The main scientific journals at the European level, classified based on their impact factor, demonstrate the inherent transversality in the study of insularity (Table 3). Marine Pollution Bulletin, with an h-index of 13, constitutes the primary research source in the field of island studies. The second and third main sources are Sustainability (Switzerland) *and Island Studies Journal,* with an h-index of 13 and 8, respectively. Coinciding with the main identified theme, other leading journals are linked to the fields of sustainability and climate change in marine conservation fields, among which Frontiers in Marine Science and Journal of Cleaner Production and Marine Policy stand out. In particular, the relevance of the journals Marine Pollution Bulletin, Sustainability (Switzerland), Frontiers in Marine Science, Marine Policy, Science of The Total Environment and Biological Conservation is noteworthy both globally (see Appendix A) and in Europe.

Table 3. Classification of journals by h-index. Top 20, European Union.

Journal	h_index	g_index	m_index	TCs	NP	PY_start
Marine Pollution Bulletin	13	22	1.00	764	22	2012
Sustainability (Switzerland)	13	18	1.30	438	42	2015
Island Studies Journal	8	13	0.89	193	21	2016

Table 3. *Cont.*

Journal	h_index	g_index	m_index	TCs	NP	PY_start
Frontiers in Marine Science	7	13	0.88	185	20	2017
Journal of Cleaner Production	7	10	1.00	301	10	2018
Marine Policy	7	12	0.39	164	13	2007
Ecological Economics	6	6	0.40	265	6	2010
Science of The Total Environment	6	10	1.00	105	10	2019
Diversity	5	8	1.00	85	8	2020
Ecological Indicators	5	5	0.42	129	5	2013
Energy Policy	5	5	0.29	198	5	2008
Environmental Pollution	5	5	0.63	209	5	2017
Land	5	9	0.42	95	11	2013
Ocean and Coastal Management	5	6	0.63	46	7	2017
Renewable Energy	5	5	0.45	171	5	2014
Biological Conservation	4	4	0.22	155	4	2007
European Planning Studies	4	5	0.18	57	5	2003
Geopolitics	4	5	0.25	333	5	2009
Journal of Environmental Management	4	4	0.27	760	4	2010
Journal of Marine and Island Cultures	4	7	0.33	61	7	2013

3.2.2. Production by Authors

Regarding the local impact metrics by authors (Table 4), the highest h-index (20) is attributed to Godfrey Baldacchino, professor of sociology at the University of Malta and founding editor of Island Studies Journal. He is the most prominent author in both dimensions of this study, suggesting that his contributions are highly recognized both at the European and global levels in the field of insularity. Similarly, Ilan Kelman, PhD in philosophy and researcher at University College London, presents the second highest h-index (15). On the other hand, Stacy-Ann Robinson, PhD in global climate change from The Australian National University and a researcher specializing in small island developing states (SIDS), has the highest m-index (1.50), indicating considerable influence in her current research field. Regarding the number of citations, Yves Cherel, PhD in biology and research director at the French National Centre of Scientific Research, stands out with a total of 1304 citations. Lastly, in terms of the number of publications, the author G. Baldacchino is noteworthy, with a total of 32 articles related to insularity.

Table 4. Production by authors. Top 20, global.

Author	h_index	g_index	m_index	TCs	NP	PY_start
Baldacchino Godfrey	20	30	0.63	950	32	1993
Kelman Ilan	15	28	0.94	1034	28	2009
Borges Paulo	14	22	0.88	505	22	2009
Cardoso Pedro	13	21	0.72	625	21	2007
Cherel Yves	13	14	0.50	1304	14	1999
Ryan Peter G.	13	19	0.48	928	19	1998
Connell John	12	20	0.57	432	21	2004
Robinson Stacy-Ann	12	20	1.50	417	20	2017
Triantis Kostas A.	12	16	0.71	1117	16	2008
Fernández-Palacios José M.	11	17	0.61	398	17	2007
Phillips Richard A.	11	12	0.39	391	12	1997
Andréfouët Serge	10	15	0.40	693	15	2000
Friedlander Alan M.	10	11	0.44	1052	11	2002
Godley Brendan J.	10	12	0.39	332	12	1999
Hays Graeme C.	10	13	0.39	511	13	1999
Kovacs Kit M.	10	14	0.83	306	14	2013
Lydersen Christian	10	14	0.83	306	14	2013
O'connor Sue	10	11	0.56	496	11	2007
Rigal François	10	16	0.91	426	16	2014
Shah Kalim U.	10	12	0.56	530	12	2007

Compared to the European level (see Appendix A), authors G. Baldacchino and Jochen Hinkel, PhD in environmental sciences and senior researcher at the Global Climate Forum (GCF), both stand out for their h-index and g-index metrics. In terms of the m-index, Carme Alomar, PhD in Marine Ecology and researcher at the Balearic Oceanographic Centre; and Salud Deudero, PhD in biology and director of the Balearic Oceanographic Centre, both have an index of 0.8, indicating high recent productivity results.

Regarding the collaboration network analysis, within the scope of the European domain (Figure 3), this segmentation reflects the different geographical and thematic areas on which researchers from the European Union focus in the study of insularity. Key clusters include Hernandez-Borges et al. (green), focused on marine ecology and biodiversity and Ferraro et al. (red), centered on environmental economics and policies. Notable clusters also include Alomar et al. (blue), emphasizing marine pollution studies, and Hinkel et al. (dark blue), addressing climate adaptation and risk management. Inter-cluster connections suggest interdisciplinary collaboration, with authors such as Jochen Hinkel and Godfrey Baldacchino bridging sustainable development and planning themes. The diverse and collaborative nature of this network highlights the multifaceted approach necessary to tackle complex issues in island research.

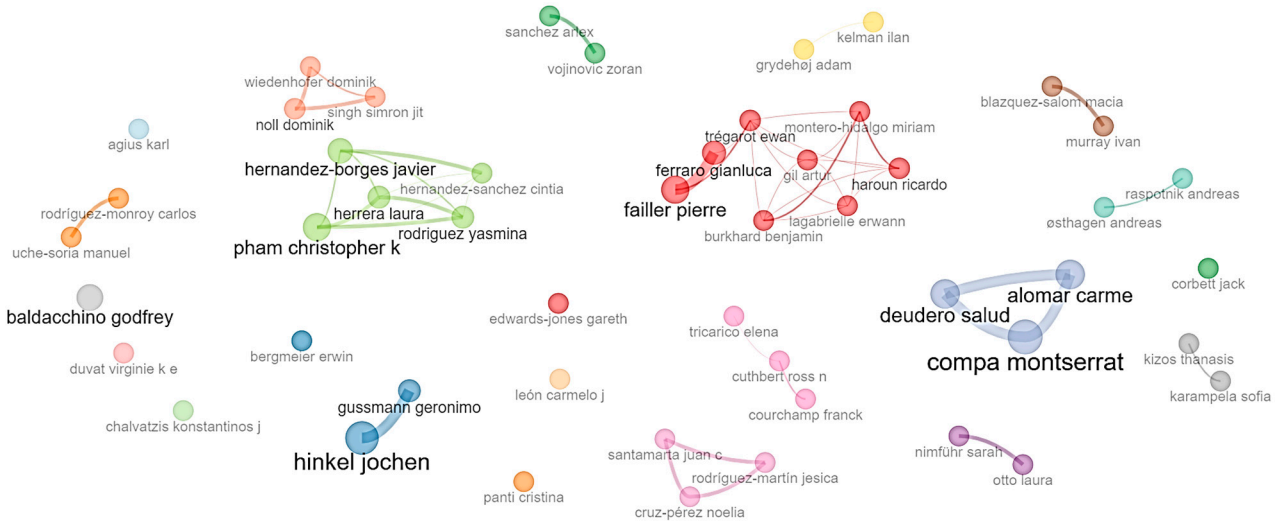

Figure 3. Collaboration network among authors, European Union database.

3.2.3. Production by Countries

Scientific production by country regarding insularity (Table 5) in the European Union shows Spain, the United Kingdom, Portugal and Greece as leaders in terms of the number and percentage of published articles. Regarding national and international collaboration, the United States has a high proportion of international collaboration, which explains its involvement in European insularity research. Similarly, Germany presents high international collaboration. In contrast, Spain, the United Kingdom and Greece stand out for their high degree of intranational collaboration. Finally, the international collaboration ratio indicates that Germany and Austria produce 25% and 50% of their research through international collaboration, respectively.

Table 5. Main scientific production by countries. Top 20, European Union.

Country	Articles	% Articles	SCP	MCP	MCP_Ratio
Spain	115	15.7	96	19	16.5
United Kingdom	66	9	42	24	36.4
Portugal	47	6.4	31	16	34

Table 5. *Cont.*

Country	Articles	% Articles	SCP	MCP	MCP_Ratio
Greece	35	4.8	29	6	17.1
Germany	32	4.4	24	8	25
Italy	31	4.2	21	10	32.3
Usa	31	4.2	23	8	25.8
France	23	3.1	21	2	8.7
Netherlands	20	2.7	15	5	25
Australia	19	2.6	10	9	47.4
Canada	16	2.2	7	9	56.3
Malta	16	2.2	13	3	18.8
Norway	15	2	7	8	53.3
Ireland	12	1.6	7	5	41.7
Poland	12	1.6	9	3	25
Sweden	11	1.5	7	4	36.4
Austria	10	1.4	5	5	50
Croatia	9	1.2	8	1	11.1
Finland	9	1.2	8	1	11.1
Indonesia	9	1.2	8	1	11.1

In comparison to European insularity, the global level (see Appendix A) also highlights the United States in terms of production and proportion of articles, along with the United Kingdom and Australia. Regarding international collaboration, Germany (51.8%), Portugal (48.5%) and the Netherlands (42%) stand out. It is remarkable to mention that Europe has a significant presence in global insularity research, as 50% of the countries, including the United Kingdom, are present in the global top 20.

3.2.4. Production by Affiliation

Regarding scientific production by universities (Table 6), leading institutions are associated with or located in insular regions. The University of La Laguna (Tenerife), University of Las Palmas de Gran Canaria, University of the Azores, University of Malta and University of the Aegean emerge as significant contributors. Similarly, at the global level (see Appendix A), universities from insular regions demonstrate a notable presence but generally yield fewer articles compared to their counterparts in larger global networks. Insular universities, such as the University of La Laguna and the University of Las Palmas de Gran Canaria maintain a substantial presence within their regional contexts but produce fewer articles compared to major global networks such as the University of California and the Australian National University, which dominate in terms of the volume of scientific output.

Table 6. Top 20 universities, European Union.

Affiliation	Articles
University of La Laguna	44
University of Las Palmas Gran Canaria	41
University of the Azores	40
University of Malta	29
Humboldt University	15
University of the Aegean	14
University of the Balearic Islands	13
Spanish Institute of Oceanography	9
Stockholm University	9
University of East Anglia	9
University of Zagreb	9
National and Kapodistrian University of Athens	8

Table 6. *Cont.*

Affiliation	Articles
University of Palermo	8
Global Climate Forum	7
Institute of Botany	7
National Technical University of Athens	7
Sapienza University of Rome	7
University of Lisbon	7
University of Siena	7
University of Aberdeen	7

3.3. Conceptual Structure

3.3.1. Global Trends

The analysis of global trends over the past 10 years, as depicted in Figure 4, reveals that initial research focused on aspects related to phylogeography, speciation and microsatellites (2015–2017). From 2017 onwards, issues concerning invasive species and genetic diversity of island territories have arisen. In 2020, tourism emerged as the main issue, highlighting the challenges stemming from the COVID-19 pandemic and the high dependence of islands on this sector [40]. The concept of small island developing states also gained prominence from 2020 onwards. Recently, there has been an observed shift towards themes associated with four key topics: biodiversity, conservation, sustainable development within the framework of the circular economy, and finally, the COVID-19 pandemic. Geographically, the Canary Islands stand out in global research on insularity.

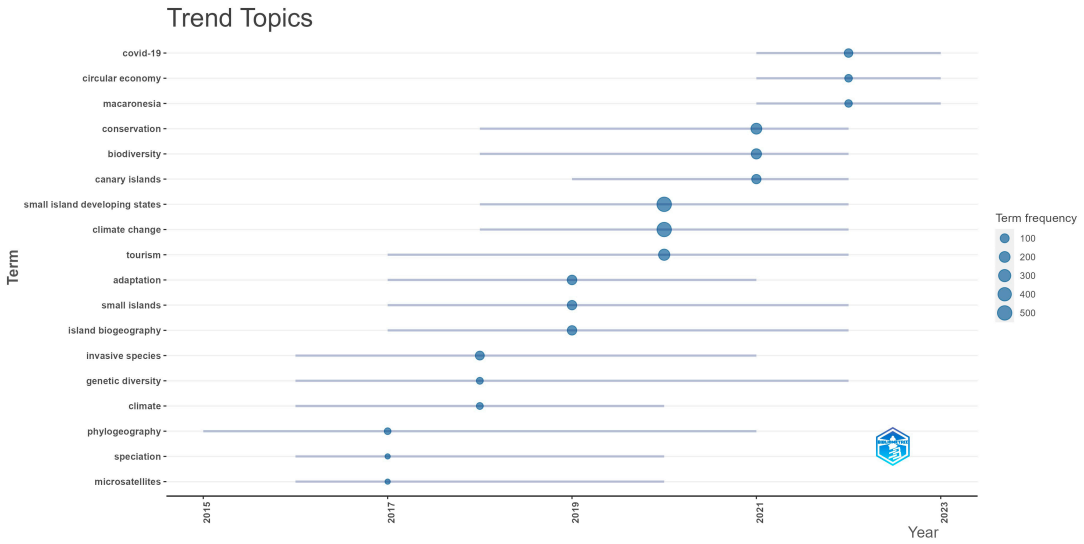

Figure 4. Global trend topics, 2013–2023. Author keywords with a minimum frequency of 20 and an average of 3 words per year.

3.3.2. Trends in the European Union

Delving into the realm of the European Union, the trend analysis of topics related to insularity (Figure 5) reveals the initial presence of Malta, Azores and the Balearic Islands as a key region in the scientific literature of 2015–2017, while in 2021 the whole Mediterranean region and the Canary Islands gained prominence. The increasing trend of concepts related to renewable energy and sustainability in 2019 reflects a growing concern over impacts and sustainable practices on European islands. In relation to this, issues such as the circular economy, microplastics and biodiversity emerge as more recent areas of study (2021–2023), indicating attention to the management and conservation of natural resources on islands, as well as the associated governance structures. It is noteworthy that the terms Canary Islands, Balearic Islands, Azores and Mediterranean depict a stable trend over the period

analyzed, indicating a continued interest in the study of insularity at the European level and its implications in various contexts.

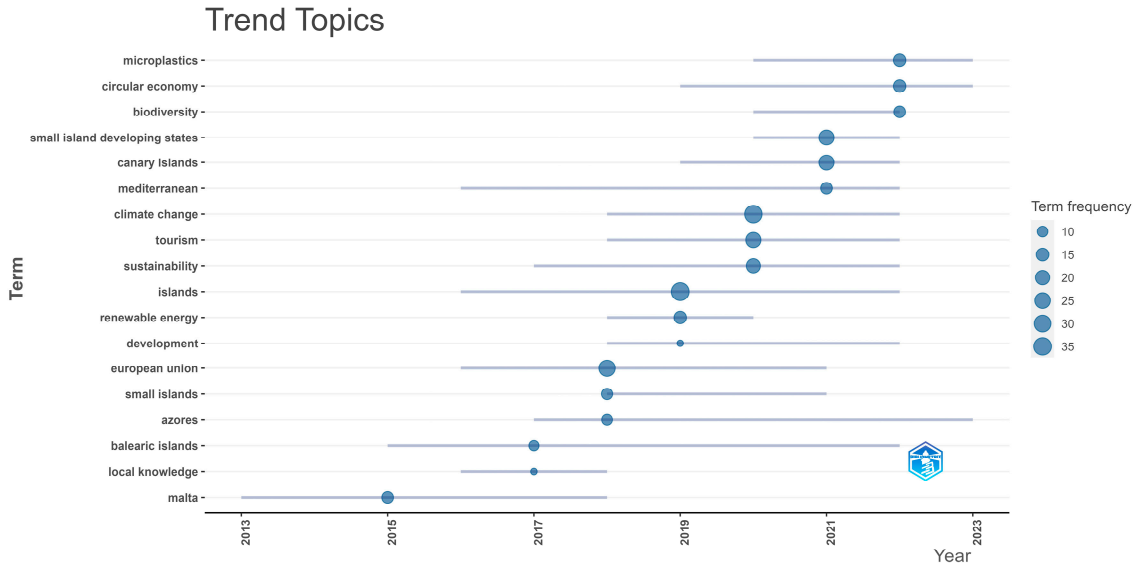

Figure 5. European Union trend topics, 2013–2023. Author keywords with a minimum frequency of 6 and an average of 3 words per year.

Both the global and European levels of analysis indicate a growing interest in climate change, biodiversity, tourism and natural resource management on islands, but the European focus includes a notable emphasis on regional studies and sustainability initiatives. At the European level, more attention is placed on associated governance structures concerning insularity.

3.3.3. Theme Map and Factorial Analysis

The main themes identified in the research on insularity within the European Union, as depicted in Figure 6 and classified according to their degree of centrality and density, are divided into the following groups:

- Motor themes: this dimension of this study encompasses a wide range of topics, including waste management, biowaste and analysis, reflecting the importance of sustainable waste practices. Another theme is climate justice, which includes loss and damage analysis. Additionally, major economies (Russia, China) demonstrate the geopolitical dimensions impacting insular regions.
- Basic or cross-cutting themes: themes of climate change, sustainable development, renewable energies and policy in ultra-peripheral regions demonstrate the cross-cutting nature of the concept of insularity in Europe. Biodiversity, conservation and marine litter keep highlighting the environmental priorities, as well as the circular economy, food waste and recycling. On the other hand, migration and development, international relations and the Caribbean are included in this section.
- Niche themes: A group of specialized themes addresses economic growth, Ireland and Brexit, reflecting economic and political dynamics impacting insular regions. On the other hand, another set of themes includes marine protected areas, the western Mediterranean Sea, the Indian Ocean and mapping, indicating focused ecological and geographical studies. Finally, the rest of the specialized themes involve concepts such as local knowledge, traditional ecological knowledge and participatory planning, highlighting community involvement in environmental management.
- Emerging or declining themes: ocean governance, referred to as the "blue economy", is the main emerging theme. This concept refers to the sustainable use of ocean resources to support the economy, livelihoods and health of the oceanic ecosystem. Other themes

in this category include small-scale fisheries, EU and United Kingdom, indicating areas where research interest may be beginning to grow or diminish.

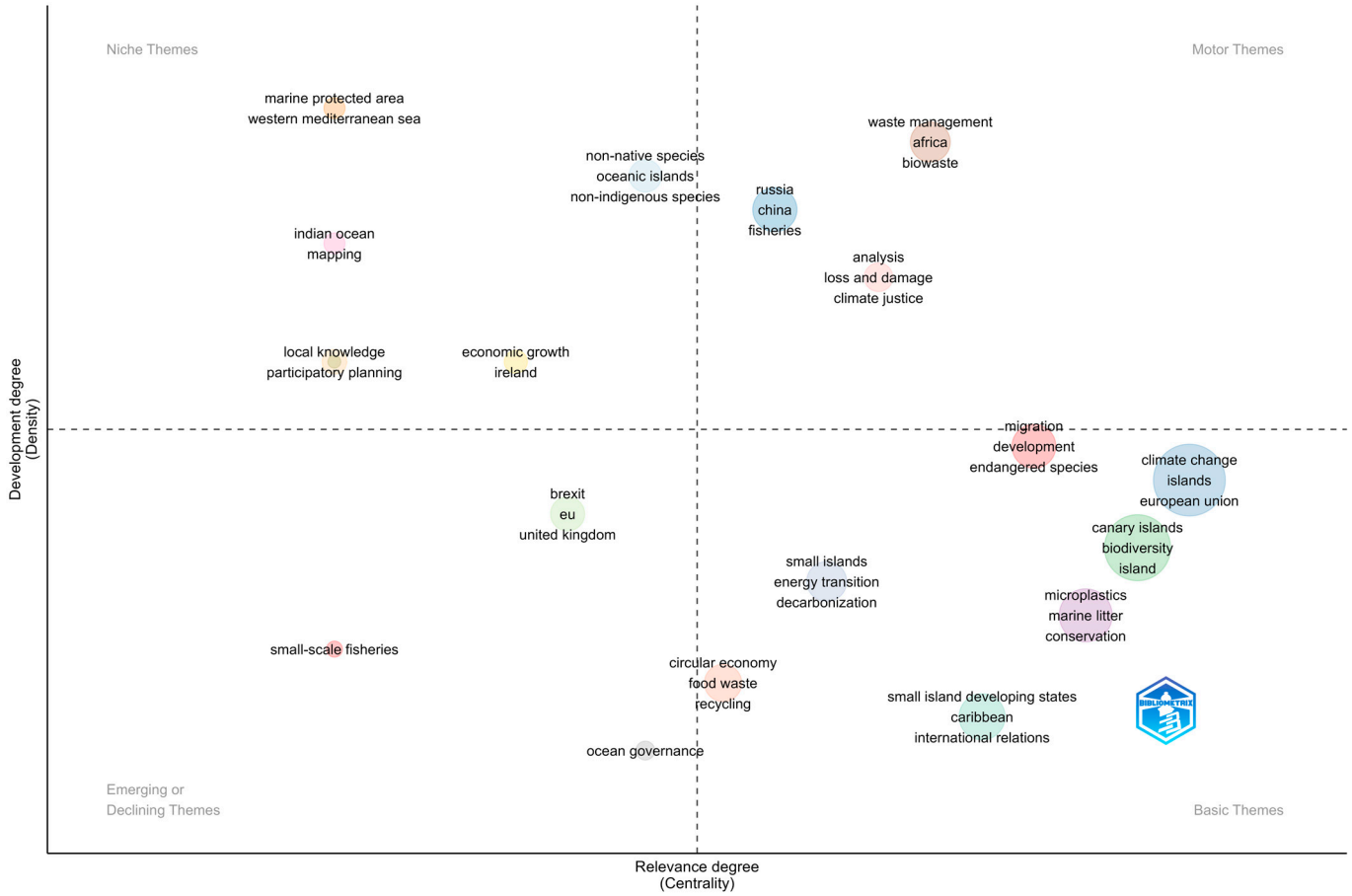

Figure 6. Theme map, European Union. Number of words: 230. Minimum cluster frequency: 5. Number of labels: 3. Clustering algorithm: walktrap.

Specifically, in the factorial analysis conducted, 18 clusters have been identified and classified into six main groups according to the addressed themes.

Group 1. The circular economy and sustainable development. This group focuses on the transition towards a sustainable and circular economy, addressing various aspects of waste management, resource conservation and environmental sustainability.

- Cluster 1: the circular economy. Keywords include circular economy, food waste and recycling.
- Cluster 2: microplastics. This cluster covers microplastics, marine litter, conservation, marine debris, insularity, Madeira Island, plastic pollution, pollution, monitoring, plastic, waste and marine protected areas.
- Cluster 3: waste management. Topics include waste management, Africa, biowaste, material flow analysis (MFA), industrial ecology, life cycle assessment and social metabolism.
- Cluster 4: climate change. It includes climate change, renewable energy, sustainability, sustainable development, sustainable development goals, climate adaptation, blue growth, equity, global change, impacts and innovation.
- Cluster 5: small-scale fisheries: this includes small-scale fisheries and the blue economy.

Group 2. Island and regional development. This group examines the unique challenges and development opportunities faced by islands and specific regions, focusing on their economic, social and environmental aspects.

- Cluster 6: the Canary Islands and other regions. Key topics are the Canary Islands, biodiversity, island, ecosystem services, the Azores, the Balearic Islands, COVID-19, Malta, Spain, the Baltic Sea, risk management, archipelago, distribution, environment, island studies, Croatia, islandness, mobility, beach, protected areas, wave energy, cross-border cooperation, ethnography, landscape, marine spatial planning, prevention, refugees, Sardinia and Sicily.
- Cluster 7: small islands. Topics cover small islands, energy transition, decarbonization, island states and the Mediterranean Sea.

Group 3. Governance and ocean resources. This group addresses the management and governance of ocean resources, emphasizing sustainable practices and the economic potential of the blue economy.

- Cluster 8: ocean governance. Examines ocean governance and the challenges faced by developing countries in this context.
- Cluster 9: the blue economy. It includes the blue economy, maritime spatial planning, resilience, vulnerability, adaptation, marine spatial planning and tuna.

Group 4. Politics and international relations. This group explores the political and international dimensions of insularity, focusing on the relationships between regions, countries and global political entities.

- Cluster 10: Brexit. This theme examines Brexit, the EU and the United Kingdom.
- Cluster 11: small island developing states. Key topics include small island developing states, the Caribbean, international relations and sea-level rise.
- Cluster 12: Russia and China. Research here includes Russia, China, fisheries, Svalbard, Norway, cooperation and economics.

Group 5. Indicators and social development. This group focuses on the measurement and analysis of social and economic indicators and the impact of these factors on development.

- Cluster 13: economic growth. Keywords include economic growth and Ireland.
- Cluster 14: analysis and social issues. Topics cover analysis, loss and damage and climate justice.
- Cluster 15: migration and development. This cluster comprises concepts such as migration, development, endangered species, growth, biogeography, diversity and energy security, indicating a broad interest in how migration influences and is influenced by ecological, social and economic factors.
- Cluster 16: local knowledge. Keywords are local knowledge, cultural heritage and participatory planning.

Group 6. Urban and environmental challenges. This group examines the environmental and urban challenges faced by insular and peripheral regions, including biodiversity conservation, pollution and urban development.

- Cluster 17: threatened species and non-native species. This cluster includes threatened species, non-native species, oceanic islands, non-indigenous species and Pacific island countries.
- Cluster 18: urban and environmental challenges. Keywords include urban sprawl, evictions, foreclosures, beach, biological invasions and marine protected areas.

In comparison with the thematic map and corresponding factorial analysis on insularity at the global level (see Appendix A), both databases share three common areas of interest: sustainable development, particularly environmental concern, climate change and renewable energy; economic development, regarding the tourism sector and panel data collection; and the study of island identity to understand the socio-economic and cultural dynamics of the islands. However, in the global analysis, there is a higher proportion of research directly related to climate change in SIDS.

3.4. Most Cited Articles

The extraction of the most cited articles at both European Union (EU) and global scales (see Appendix A) reveals a diverse range of research themes central to understanding and addressing the challenges faced by island communities.

Within the scope of the European Union, regarding citation impact, the paper by Hinkel J. (2013) on the evaluation of sea-level rise on island beaches presents the highest total citations (177) and a high annual citation rate (14.75), indicating a strong and sustained impact in the field. Secondly, the 2017 paper by Lourenco P.M., tackling environmental pollution, has a high total citation count (154), with an average annual citation rate of 19.25, suggesting its influence has been significant over a shorter period. The 2019 paper by Borawski P. on renewable energy sources on islands also shows a notable influence, with 151 citations and an annual rate of 25.17. In terms of normalized citations, this metric counts the relative impact of these works within their respective fields and time periods. Borawski P. (2019) and Hinkel J. (2018) stand out, with a high normalized TC of 8.8 and 5.23, respectively, indicating exceptional influence.

The next section details the research scope by analyzing their respective abstracts.

- Hinkel J. (2013) applies the DIVA model to analyze the erosion of sandy beaches globally in the context of the sea-level rise, providing insights that are crucial for coastal management strategies.
- Lourenco P.M. (2017) investigates the presence and impact of microplastics on intertidal ecosystems across Europe and Africa, highlighting environmental contamination and potential ecological consequences.
- Borawski P. (2019) examines the market development of renewable energy sources and biofuels within the EU, offering insights into policy frameworks and market dynamics that are crucial for sustainable energy transitions on EU islands.
- Hinkel J. (2018) assesses societal adaptation capabilities to the sea-level rise in the 21st century, discussing strategies and challenges for resilience building in coastal communities globally.
- Balzan M.V. (2018) analyzes ecosystem services in Mediterranean small island landscapes, revealing the gradients in service capacity between rural and urban areas, which are essential for sustainable land-use planning.

At the global level, the most cited articles also cover a wide array of significant themes: McGranahan G. (2007), as mentioned, shows a strong impact, with its focus on climate change risks in low elevation coastal zones. The 2016 paper by Mucina L. on island vegetation shows a high number of TCs per year (115.56), suggesting it is highly relevant in recent years and has the highest number of normalized TCs (46.39), indicating an exceptional influence. Briguglio L (1995), in *World Development*, has a high total citation count (695) but a lower average annual citation rate (23.17), suggesting its impact has been steadier over a longer period.

Analyzing their abstracts reveals the following:

- McGranahan Gordon (2007) assesses the risks posed by climate change to human settlements in low elevation coastal zones, highlighting the urgent need for adaptive strategies to mitigate the impacts on vulnerable populations.
- Mucina L. (2016) develops a comprehensive classification system for European vegetation, focusing on island biodiversity and offering a crucial tool for conservation efforts and ecological studies.
- Briguglio L. (1995) analyzes the economic vulnerabilities of small island developing states (SIDS), providing insights into the unique challenges these states face and suggesting strategies to enhance their economic resilience.
- Lusseau D. (2003) investigates the effects of climate change on island wildlife, detailing how the shifts in climate patterns impact biodiversity and ecosystems on islands.

- Nunkoo R. (2012) addresses the socio-economic impacts of tourism on island residents, offering insights into sustainable tourism development, particularly relevant for islands heavily dependent on tourism for economic growth.

Both EU and global studies emphasize the importance of integrating local and scientific knowledge in insularity research. Climate change and adaptation strategies are critical topics in both contexts, reflecting the global urgency of these issues. Additionally, the impact of tourism is a significant concern in both EU and global studies, highlighting its socio-economic and environmental implications. However, there are notable differences: EU studies have a stronger focus on economic issues, including development, crises and trade, reflecting regional priorities and challenges. Global studies, on the other hand, place greater emphasis on environmental management and the vulnerabilities of insular regions, indicating a broader, multidimensional approach.

3.5. Research Gaps

Regarding under-researched or emerging areas in the literature, five research opportunities are identified based on the frequency of themes identified in the factorial analysis at the European level (see Appendix A):

- Economic growth: the infrequent occurrence of this cluster suggests a pressing need to evaluate and develop economic policies that address the unique effects of insularity in Europe, focusing on sustainable growth and resilience.
- Ocean governance and marine resources: The limited number of studies on ocean governance indicates an opportunity to enhance the management of marine resources on European islands. This includes improving conservation efforts, ensuring sustainable fishing practices and safeguarding marine biodiversity.
- Marine protected areas and small-scale fisheries: The low presence of research on MPAs and small-scale fisheries highlights the necessity for more studies on their economic roles in island communities. Additionally, it is crucial to address the challenges posed by overfishing, climate change and regulatory issues in promoting sustainable fisheries and marine conservation.
- Impact of evictions/migration: The sparse occurrence of studies on evictions underscores the need to examine and mitigate the social and economic impacts of evictions on European islands. This also involves developing policies and practices that protect residents' rights and promote social stability.
- Urban challenges: the minimal focus on urban challenges suggests the need for comprehensive research into the dynamics of urban sprawl and local development in insular communities

In particular, coinciding with the Annual General Assembly of the Islands Commission of the CRPM (2022), there is a special emphasis on the need to obtain new specific indicators on insularity and peripheral regions, as data collected at a more granular geographic level are needed [10,18]. However, there are current limitations in the quantitative data, which could be improved with a greater availability of high-resolution geographic data, allowing for a deeper analysis of aspects such as demography, air pollution and land use [7]. Additionally, there is a considerable research gap in social aspects, such as access to housing and gender-based violence [41], as well as in political aspects, referring to proposals for legal and fiscal regulation in island territories.

4. Conclusions

This study offers a comprehensive overview of the current state of research in the field of insularity and islands, identifying key publications, authors, institutions and interdisciplinary connections. It provides an exhaustive database that can serve as a reference for future research and policies related to the islands in the European Union. Governance in the context of islands emerges as a particularly relevant theme, especially in relation to the objectives set forth in the Annual General Assembly of the Islands Commission of the CRPM (2022) and the Sustainable Development Goals (SDGs) of the

Agenda 2030. This connection underscores the importance of addressing the specific challenges faced by island regions in terms of sustainable development and appropriate policies.

Regarding the main findings of this study, the growing academic importance of insularity is confirmed, as well as the interdisciplinary nature of publications on the subject. Research on insularity focuses on countries such as Spain, the United Kingdom and Portugal, with prominent international collaboration. The Canary Islands universities of La Laguna and Las Palmas de Gran Canaria are leaders both at the European and global levels in this field. In terms of conceptual structure, in Europe, the Balearic Islands, the Canary Islands, Malta and the Azores have stood out as key regions, while concepts such as biodiversity and the circular economy emerge as relevant areas of study. The driving themes of research focus on waste management and climate justice, while five under-explored areas in European insularity have been identified: economic growth, the management of marine resources, sustainable fisheries and marine protected areas, as well as the impact of evictions and urban challenges on European islands.

Important research proposals are revealed to advance the field of insularity, such as the creation of a corresponding ontological analysis and the monitoring of insularity through specific indicators for the European islands. These proposals aim to fill gaps in the current understanding and allow for a more precise and detailed analysis of island dynamics. In parallel, the global challenges faced by island regions have been objectively categorized, using a wide range of academic references as a basis. This categorization provides an organized and relevant guide for understanding the challenges faced by islands from a broader perspective, enabling the prioritization of intervention areas and specific policies.

Regarding the limitations of the analysis conducted, it is worth noting the exclusion of technical reports on insularity from European institutions in the bibliometric quantitative analysis, although they were considered during the article's development as fundamental reference points [7,8,10,17].

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Data Availability Statement: The original contributions presented in the study are included in the article, further inquiries can be directed to the corresponding author.

Conflicts of Interest: The authors declare no conflicts of interest.

Appendix A

Table A1. Global academic networks: classification by h-index. Top 20.

Journal	h_index	g_index	m_index	TC	NP	PY_start
Marine Ecology Progress Series	82	121	2.16	24,288	448	1987
Proceedings of The Royal Society: Biological Sciences	62	98	2.21	10,453	151	1997
Marine Pollution Bulletin	50	78	1.28	7844	221	1986
Journal of Biogeography	42	72	1.45	6136	166	1996
Science of The Total Environment	33	64	1.65	4605	142	2005
Biological Conservation	32	54	0.78	3035	68	1984
Global Ecology and Biogeography	30	49	1.20	2788	49	2000
Journal of Applied Ecology	30	41	1.11	2706	41	1998
Journal of Ecology	30	45	1.11	3704	45	1998
Tourism Management	30	41	0.97	2562	41	1994

Table A1. *Cont.*

Journal	h_index	g_index	m_index	TC	NP	PY_start
Marine Policy	28	47	0.60	2707	120	1978
New Zealand Journal of Marine and Freshwater Research	28	42	0.50	2220	93	1969
Frontiers in Marine Science	27	38	2.45	3285	324	2014
Journal of Geophysical Research Atmospheres	27	41	0.96	2126	41	1997
Journal of Mammalogy	27	38	0.79	1996	89	1991
Oryx	27	42	0.42	2478	124	1961
Quaternary Science Reviews	27	43	1.42	2089	78	2006
Sustainability (Switzerland)	27	35	2.25	3089	296	2013
Applied and Environmental Microbiology	26	34	0.70	2446	34	1988
World Development	25	48	0.56	3176	48	1980

Table A2. European Union academic networks: authors by scientific production.

Author	h_index	g_index	m_index	TC	NP	PY_start
Baldacchino Godfrey	9	9	0.36	351	9	2000
Hinkel Jochen	7	9	0.5	472	9	2011
Alomar Carme	4	5	0.8	77	5	2020
Compa Montserrat	4	7	0.57	256	7	2018
Deudero Salud	4	5	0.8	77	5	2020
Noll Dominik	4	4	0.67	73	4	2019
Agius Karl	3	4	0.75	30	4	2021
Blazquez-Salom Macia	3	4	0.25	63	4	2013
Chalvatzis Konstantinos J.	3	3	0.43	83	3	2018
Corbett Jack	3	3	0.5	47	3	2019
Courchamp Franck	3	3	0.75	41	3	2021
Cuthbert Ross N.	3	3	0.6	51	3	2020
Edwards-Jones Gareth	3	3	0.21	174	3	2011
Gussmann Geronimo	3	5	0.6	47	5	2020
Kelman Ilan	3	4	0.3	52	4	2015
Kizos Thanasis	3	3	0.25	55	3	2013
Murray Ivan	3	4	0.3	30	4	2015
Nimführ Sarah	3	3	0.5	41	3	2019
Otto Laura	3	3	0.5	41	3	2019
Rodríguez-Monroy Carlos	3	3	0.43	48	3	2018

Table A3. Global academic networks: countries by scientific production.

Country	Articles	% ARTICLES	SCP	MCP	MCP_Ratio
Usa	1785	13.3	1340	445	24.9
United Kingdom	974	7.3	588	386	39.6
Australia	773	5.8	491	282	36.5
Spain	731	5.5	503	228	31.2
China	575	4.3	463	112	19.5
France	500	3.7	334	166	33.2
Canada	477	3.6	306	171	35.8
Portugal	423	3.2	218	205	48.5
Germany	371	2.8	179	192	51.8
New Zealand	356	2.7	263	93	26.1
Italy	352	2.6	243	109	31
Indonesia	332	2.5	257	75	22.6
Japan	294	2.2	224	70	23.8
Netherlands	238	1.8	138	100	42

Table A3. *Cont.*

Country	Articles	% ARTICLES	SCP	MCP	MCP_Ratio
Norway	178	1.3	105	73	41
Sweden	178	1.3	114	64	36
Brazil	170	1.3	113	57	33.5
Greece	167	1.2	135	32	19.2
Finland	132	1	83	49	37.1
Korea	131	1	104	27	20.6

Table A4. Global academic networks: universities by scientific production.

Affiliation	Articles
University of California	235
University of the Azores	224
Australian National University	218
Universidad de Las Palmas de Gran Canaria	172
James Cook University	147
Universidad de La Laguna	110
University of Helsinki	109
University of Otago	108
University of Oxford	108
University of Exeter	107
Stockholm University	105
Universidade de Lisboa	100
University of Queensland	100
University of Auckland	91
Notreported	88
Griffith University	87
University of Cambridge	86
University of Florida	83
University of Washington	81
University of East Anglia	80

Table A5. Clusters associated to the global theme map.

	Cluster	Number of Occurrences
1	climate change	1180
2	tourism	779
3	sustainable development	733
4	insularity	201
5	islandness	167
6	economic growth	139
7	Spain	86
8	circular economy	86
9	renewable energy	72
10	China	64
11	Indonesia	61
12	the Canary Islands	43

Table A6. Clusters associated to the European Union theme map.

	Cluster	Number of Occurrences
1	climate change	348
2	the Canary Islands	219
3	microplastics	77
4	small island developing states	44
5	Russia	38

Table A6. *Cont.*

	Cluster	Number of Occurrences
6	migration	37
7	small islands	27
8	waste management	27
9	circular economy	22
10	Brexit	17
11	non-native species	15
12	analysis and social issues	11
13	local knowledge	11
14	economic growth	7
15	marine protected area	6
16	ocean governance	5
17	small-scale fisheries	4
18	urban challenges	3

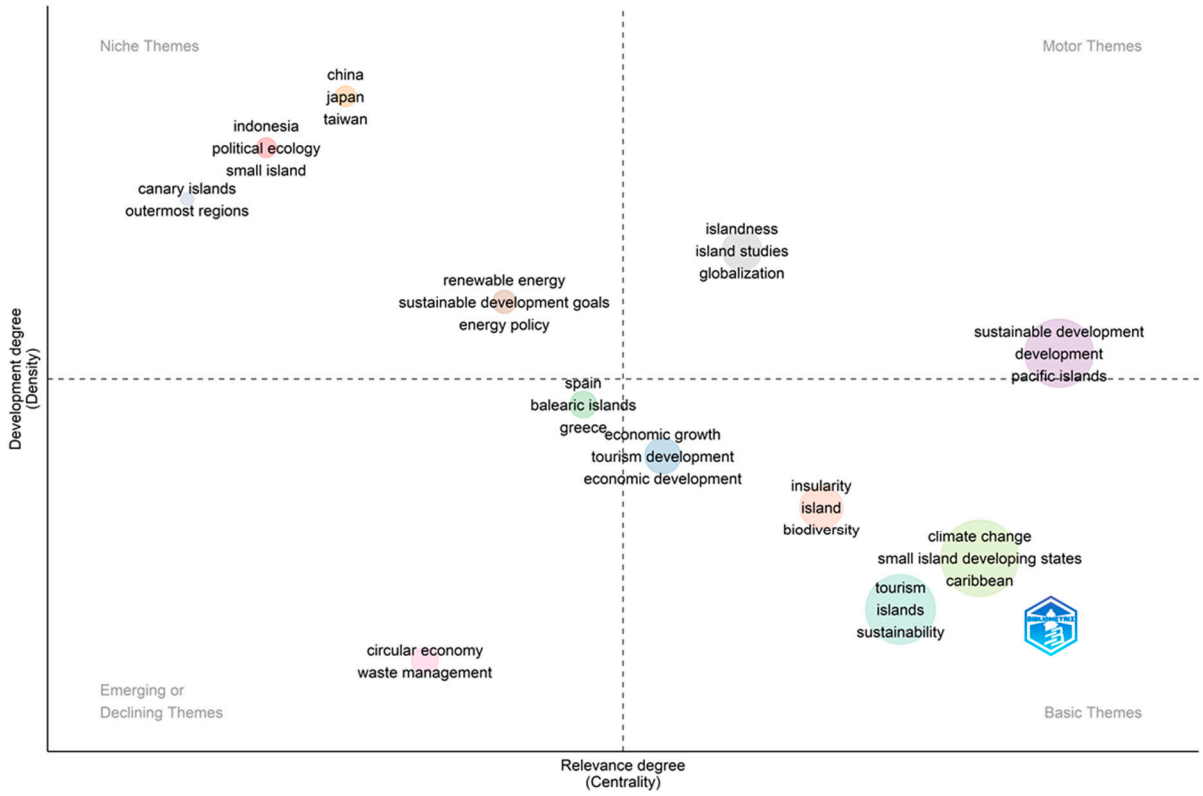

Figure A1. Theme map, global scale. Number of words: 230. Minimum cluster frequency: 4. Number of labels: 3. Clustering algorithm: walktrap.

Table A7. Top 10 papers by total citations and insularity, at a global scale.

Author	Title	DOI	Year	TC	TC_year	Norm_TC
McGranahan Gordon	The rising tide: assessing the risks of climate change and human settlements in low elevation coastal zones	10.1177/0956247807076960	2007	1478	82.11	29.39
Mucina L.	Vegetation of Europe: hierarchical floristic classification system of vascular plant, bryophyte, lichen and algal communities for island biodiversity	10.1111/avsc.12257	2016	1067	118.56	46.39

Table A7. *Cont.*

Author	Title	DOI	Year	TC	TC_year	Norm_TC
Briguglio L.	Small island developing states and their economic vulnerabilities	10.1016/0305-750X(95)00065-K	1995	695	23.17	14.6
Lusseau D.	Impacts of Climate Change on Island Fauna and Flora	10.1098/rsbl.2003.0057	2003	664	30.18	8.94
Whittaker R. J.	A general dynamic theory of oceanic island biogeography	10.1111/j.1365-2699.2008.01892.x	2008	572	33.65	14.54
Nicholls R. J.	Increasing flood risk and wetland losses due to global sea-level rise: regional and global analyses	10.1016/S0959-3780(99)00019-9	1999	558	21.46	9.18
Nunkoo Robin	Residents' support for tourism: An Identity Perspective	10.1016/j.annals.2011.05.006	2012	486	37.38	14.07
Brohman J.	New directions in tourism for third world development	10.1016/0160-7383(95)00043-7	1996	404	13.93	7.78
Dekiff Jens H.	Occurrence and spatial distribution of microplastics in sediments from Norderney	10.1016/j.envpol.2013.11.019	2014	392	35.64	14.23
Mertz Ole	Adaptation to Climate Change in Developing Countries	10.1007/s00267-008-9259-3	2009	386	24.13	9.36

Table references: [21,42–50].

Table A8. Top 10 papers by total citations, insularity (European Union).

Author	Title	DOI	Year	TC	TC_year	Norm_TC
Hinkel J.	A global analysis of erosion of sandy beaches and sea-level rise: An application of DIVA	10.1016/j.gloplacha.2013.09.002	2013	177	14.75	4.67
Lourenco P. M.	Plastic and other microfibers in sediments, macroinvertebrates and shorebirds from three intertidal wetlands of southern Europe and west Africa	10.1016/j.envpol.2017.07.103	2017	154	19.25	4.22
Borawski P.	Development of renewable energy sources market and biofuels in The European Union	10.1016/j.jclepro.2019.04.242	2019	151	25.17	8.8
Hinkel J.	The ability of societies to adapt to twenty-first-century sea-level rise	10.1038/s41558-018-0176-z	2018	137	19.57	5.23
Balzan M. V.	Assessing the capacity and flow of ecosystem services in multifunctional landscapes: Evidence of a rural-urban gradient in a Mediterranean small island state	10.1016/j.landusepol.2017.08.025	2018	84	12	3.2
Briguglio M.	When households go solar: Determinants of uptake of a Photovoltaic Scheme and policy insights	10.1016/j.enpol.2017.05.039	2017	76	9.5	2.08
Ressurreicao A.	Economic valuation of species loss in the open sea	10.1016/j.ecolecon.2010.11.009	2011	76	5.43	1.4
Baldacchino G.	The Beak of the Finch: Insights into the Economic Development of Small Economies	10.1080/00358530902757867	2009	67	4.19	2.22

Table A8. *Cont.*

Author	Title	DOI	Year	TC	TC_year	Norm_TC
Baldacchino G.	A Nationless State? Malta, National Identity and the EU	10.1080/713601632	2002	59	2.57	2.36
Pham C. K.	Total marine fishery catch for the Azores (1950–2010)	10.1093/icesjms/fst024	2013	58	4.83	1.53

Table references: [51–60].

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