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Mapping transnational collaborations for research on biodiversity and climate change

An analysis of transnational collaboration for the period 2011 - 2020

biodiversa+
European Biodiversity Partnership

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BiodivClim is a programme launched by Biodiversa in 2019 to support research on biodiversity and climate change. It consists of a joint call for international research projects, co-funded by the European Commission and a set of other activities addressed to researchers, non-academic stakeholders and research programmers of this domain. Building on the contributions from the BiodivClim and previous Biodiversa funded projects, scientific foresight work will be performed, aiming to identify new research frontiers, gaps and priorities related to biodiversity and climate change.

For more information:
www.biodiversa.eu

The BiodivClim partners

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5. National Science Fund Bulgaria, BULGARIA
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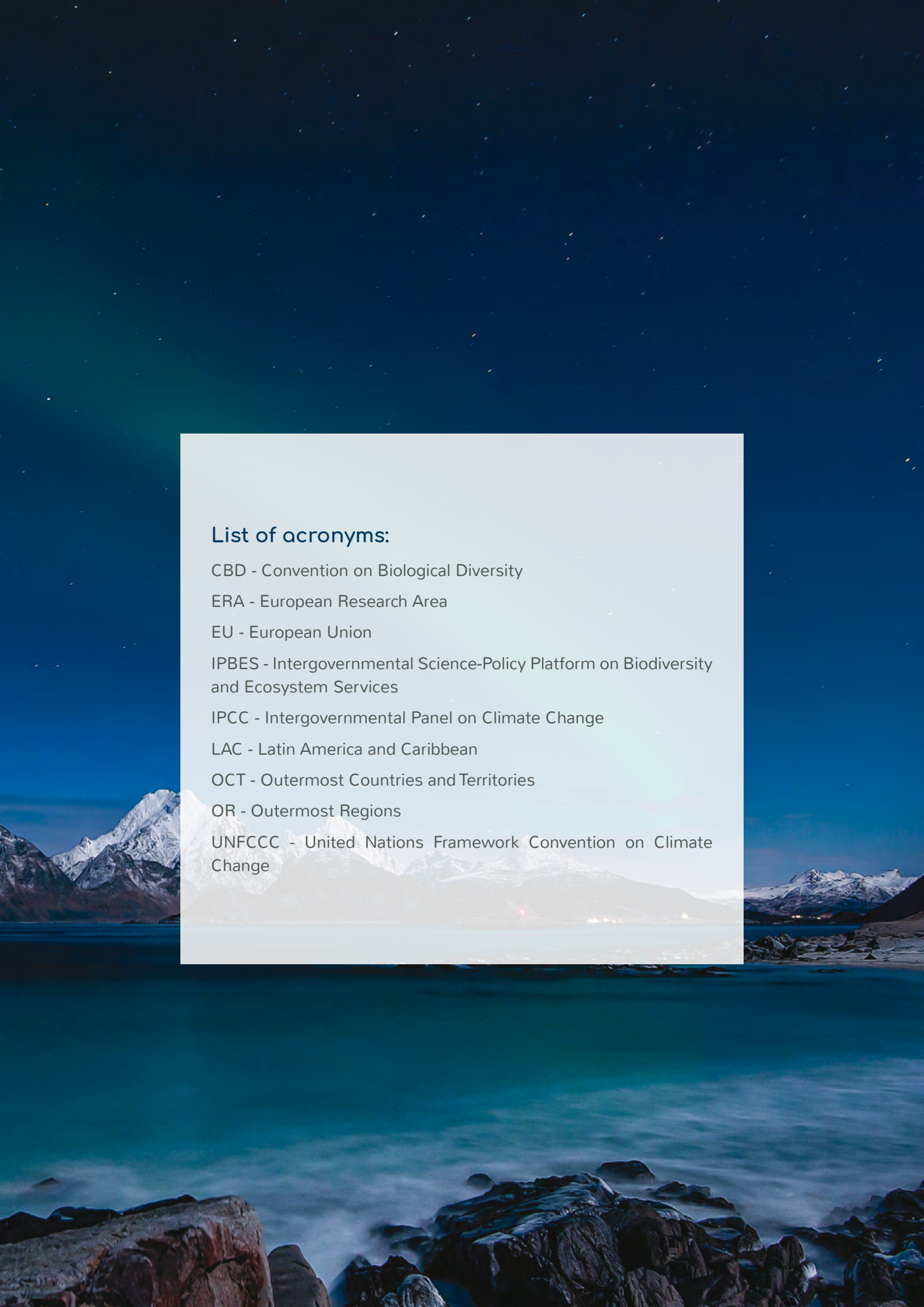


List of acronyms:

CBD - Convention on Biological Diversity

ERA - European Research Area

EU - European Union

IPBES - Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services

IPCC - Intergovernmental Panel on Climate Change

LAC - Latin America and Caribbean

OCT - Outermost Countries and Territories

OR - Outermost Regions

UNFCCC - United Nations Framework Convention on Climate Change

Introduction

It is widely recognised that climate change and biodiversity loss are twin crises that should be tackled together. In addition to the direct impacts on the economy, societies and people's health, rapidly advancing climate change negatively impacts many of the world's species and ecosystems, driving biodiversity loss. At the same time, protecting and restoring biodiversity is crucial to addressing climate change. Both the Convention on Biological Diversity (CBD) and the United Nations Framework Convention on Climate Change (UNFCCC) indeed recognise that working with nature to conserve, manage and restore ecosystems – known as Nature-Based Solutions (NBS) – is one of the most cost-effective approaches to both mitigating and adapting to climate change, and therefore to reach the targets. It is therefore imperative to understand with sufficient detail and confidence the interactions between biodiversity and climate change.

To assess transnational collaborations for research on biodiversity and climate change between the European Research Area (ERA) and other regions of the world, that is supported by several European and non-European initiatives (including Biodiversa), bibliographic analyses are a relevant tool to quantify scientific bi-regional cooperation.[1],[2] In particular, as scientific publications are the product of collaborations among researches and institutions, they can give an overview on the structure and dynamics of research networks. Therefore, the results of efforts to promote international collaboration can be assessed by analysing co-authoring networks, their temporal trends, their geographical footprint and the domains they cover.

In this mapping covering the 2011-2020 period, BiodivClim reports the results obtained from the analysis of the publications involving authors from the European research area and other regions of the world published between 2011 and 2020 to study transnational research collaboration on biodiversity and climate change. Biodiversity is defined here according to the CBD as "*the variety among living organisms from all sources including inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems*". Climate change is defined here according to the United Nations Framework Convention on Climate Change – UNFCCC as "*a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods*".

In this guide, BiodivClim discusses the implications of the results to guide further development of research collaboration on biodiversity and climate change in the future. The overarching aim of this mapping is to promote coordinated and well-targeted actions of European and international research programmers and funders. It also paves the way to future joint activities at the interface between biodiversity and climate change.

1. Melin G. and Persson O. 1996. Studying research collaboration using co-authorships. Scientometrics. 36: 336-377.
2. Russel J.M. and Ainsworth S. 2014. Mapping S&T Collaboration between Latin America and Europe: Bibliometric Analysis of Co-authorships (1984-2007). *Research Collaboration between Europe and Latin America: Mapping and Understanding partnerships*. (Eds J Gaillard and R Arvanitis), Edition des Archives contemporaines, 49-77.

Methodology

Methodology

Bibliographic review

The source of information used for this analysis was the scientometric platform Web of Science (WoS)[1]. The search was conducted on the Web of Science Core Collection ("The robust evaluation and curation of our data make the Web of Science Core Collection the world's most trusted publisher-independent global citation database"[2]) of the Clarivate citation databases (WoS, webofknowledge.com, ANELIS PLUS[3] Consortium access) and of peer-reviewed literature (e.g. articles, reviews, book chapters, proceeding papers) published between 2011-2020 – hence a 10 years record (data that were indexed until September 1, 2021[4]). The Web of Science Platform consists of several online indexes, eight of which provided references for our search: the Science Citation Index Expanded (SCI-EXPANDED): 85.9% of the references, the Social Sciences Citation Index (SSCI): 17.0% of the references, the Book Citation Index – Science (BKCI-S): 3.9% of the references, the Emerging Sources Citation Index (ESCI): 3.7% of the references, the Conference Proceedings citation Index – Science (CPCI-S): 3.0% of the references, the Book Citation Index – Social Sciences & Humanities (BKCI-SSH): 1.5% of the references, the Conference Proceedings Citation Index – Social Science & Humanities (CPCI-SSH): 0.7% of the references and the Arts & Humanities Citation Index (A&HCI): 0.4% of the references.

We retrieved all the publications with at least one author affiliated in one of the seven world regions as defined by the following taxonomy:

Countries in Africa region: Algeria, Angola, Benin, Botswana, Burkina Faso, Burundi, Cameroon, Cape Verde, Central African Republic, Chad, Comoros, Ivory coast, Democratic Republic of Congo, Djibouti, Egypt, Equatorial Guinea, Eritrea, Eswatini, Ethiopia, Gabon, Gambia, Ghana, Guinea, Guinea Bissau, Kenya, Lesotho, Liberia, Libya, Madagascar, Malawi, Mali, Mauritania, Mauritius, Mozambique, Namibia, Niger, Nigeria, Republic of the Congo, Rwanda, São Tomé and Príncipe, Senegal, Sierra Leone, Somalia, South Africa, South Sudan, Sudan, Tanzania, Togo, Uganda, Zambia, Zimbabwe.

Countries in Asia region: Afghanistan, Armenia, Azerbaijan, Bahrain, Bangladesh, Bhutan, Brunei, Cambodia, India, Indonesia, Iran, Iraq, Japan, Jordan, Kazakhstan, Kuwait, Kyrgystan, Laos, Lebanon, Malaysia, Maldives, Mongolia, Myanmar, Nepal, North Korea, Oman, China, Pakistan, Palestine, Philippines, Qatar, Saudi Arabia, Singapore, South Korea, Sri Lanka, Syria, Taiwan, Tajikitan, Thailand, Timor Leste, Turkmenistan, United Arab Emirates, Uzbekistan, Vietnam, Yemen.

Countries of the ERA (countries from EU plus Associate members): Albania, Andorra, Austria, Belgium, Bosnia and Herzegovina, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark (incl. OCTs and ORs), Estonia, Finland, France (incl. OCTs and ORs), Georgia, Germany, Greece, Hungary, Ireland, Israel, Italy, Norway, Latvia, Liechtenstein, Lithuania, Luxembourg, Macedonia, Malta, Moldova, Monaco, Montenegro, Morocco, Netherlands (incl. OCTs and ORs), North Macedonia, Norway, Poland, Portugal (incl. OCTs and ORs), Romania, San Marino, Serbia, Slovakia, Slovenia, Spain (incl. OCTs and ORs), Sweden, Switzerland, Tunisia, Turkey, United Kingdom (incl. OCTs and ORs), Vatican.

Countries in LAC region (Latin America and Caribbean countries): Antigua and Barbuda, Argentina, Aruba, Bahamas, Barbados, Belize,

1. http://www.webofscience.com/
2. https://clarivate.com/webofsciencegroup/solutions/web-of-science/
3. https://anelisplus2020.anelisplus.ro/index.php?lang=en
4. fix date of interrogation due to Web of Science Core Collection dynamic data base

Bermuda, Bolivia, Brazil, Cayman Islands, Chile, Colombia, Costa Rica, Cuba, Dominica, Dominican Republic, Ecuador, El Salvador, Falkland Island, Grenada, Guatemala, Guyana, Haiti, Honduras, Jamaica, Mexico, Nicaragua, Panama, Paraguay, Peru, Sychelles, Saint Kitts and Nevis, Saint Lucia, Saint Vincent, Suriname, Trinidad and Tobago, Uruguay, Venezuela.

Countries in North America region: Canada, United States of America.

Countries of Oceania region: Australia, Cook Islands, Denmark, Fiji, Kiribati, Marshall Islands, Micronesia, Nauru, New Zealand, Niue, Palau, Papua New Guinea, Samoa, Solomon Islands, Tonga, Tuvalu, Vanuatu.

Countries other Europe region: Belarus, Kosovo, Russia, Ukraine.

In order to obtain the data set relevant for the research (interaction type), 2 data sets were previously identified as follows:

1. Query 1

As biodiversity is a broad, multi-faceted concept, we used the following profiles of keywords to identify biodiversity-related publications: **Topic** = ("Amphibian diversity" or "Animal diversity" or "Bacteria* diversity" or "Biodiversity" or "Biodivers*" or "Biological conservation" or "Biological diversity" or "Biological invasion*" or "Bird diversity" or "Ecological service" or "Ecosystem diversity" or "Ecosystem service" or "Environmental impact statement" or "Fish diversity" or "Frog diversity" or "Functional diversity" or "Functional group*" or "Functional trait*" or "Functional type*" or "Fung* diversity" or "Genetic diversity" or "Genetic resource*" or "Habitat conservation" or "Habitat diversity" or "Insect diversity" or "Invasive species" or "Landscape diversity" or "Mammal diversity" or "Microbial diversity" or "Phylogen*" or "Plant diversity" or "Reptile diversity" or "Species conservation" or "Species diversity" or "Species loss" or "Species richness" or "Taxonom*" or "Virus diversity" or "Weed diversity") and Topic (Biodiversity).

2. Query 2

To search for publications on climate change, we used the following keywords. **Topic** = ("Climat* variab*" or "Climat* chang*" or "Climat* warming" or "Consequences of climate change" or "Global warming").

The final keyword profile selected was in fact the boolean combination in "Advance Search" section of Web of Science Platform of two above separate queries (Query 1 and Query 2).

In this way, the search was focusing on the interlinkages between biodiversity and climate change in order to analyse Web of Science Core Collection Indexed research publications dealing with this topic.

Following the search, we retrieved **17,252** indexed documents. These documents at the interface of biodiversity and climate change will be scientometrically analysed through the set of criteria ("Analyse Results" section) available in the new interface of Web of Science platform (launched in 2021).

The documents are accompanied by tagged statistics regarding the most cited papers in the field ("Highly Cited Papers" or "Hot Papers"), "Review articles" (very important for information-documentation in a certain subdomain, "Early access" - papers published in advance (online first), the works published in "Open Access" mode, "Associated Data" the works accompanied by the data sets used.

Figure 1. Labels that can be seen as tag of indexed publications in Web of Science.

Analysis and mapping of co-authoring and co-publication networks

After applying a criterion from Analysed Results section, a web page was obtained from which the data was downloaded in .txt format. These data were imported into Excel to produce relevant graphs.

In order to avoid duplications when publications were reclassified to world regions (Africa, Asia, ERA, LAC, North America, Oceania, other Europe), a new query of the Web of Science platform was necessary (e.g. Boolean programming consisted in applying the formula: (Q1 and Q2) and (USA or Canada)).

International networks of researchers were analysed based on the addresses of the authors included in their research papers. The information on the countries of scientists co-authoring a given paper was transformed into a link between countries collaborating in this paper. Finally, a triangular matrix was computed to identify the links between each pair of countries based on the number of papers co-authored by these countries.

As for the co-publication network analysis and mapping it has been performed by using the open source Gephi software (http://gephi.org).

Two-dimension spatial mappings were performed using the Force-Atlas algorithm in Gephi. This algorithm creates a visual representation of nodes (countries) connected by edges based on co-authorship according to the following rules: 1) node size represents the number of publications, 2) all nodes are attracted to the centre, i.e. the country with the highest number of publications, 3) all nodes repel each other to prevent visual overlapping of the nodes, 4) all nodes that are connected by an edge attract each other, according to the weight of the edge, i.e. the number of publications with co-authorship between the two countries/regions. Two nodes are thus spatially closer if they strongly publish together.

We also created a two-dimension map of the co-publication networks at the global level using .txt data retrieved from WoS and ISO2[5] code (Alpha-2).

5. https://www.iban.com/country-codes

Research areas and publication distribution

First analyses using the criterion "Research Areas" aim to collect most significant items out of 152 available in WoS platform (min. 1% from the biodiversity and climate change publications).

We then regrouped the relevant research areas in major research domains as follows: Earth Sciences, Life Sciences, Technology, Social Sciences, economic and humanities. The proportion of publications on biodiversity and climate change corresponding to these 4 major domains and several disciplines (e.g. for the Life Science discipline: environmental sciences ecology, biodiversity conservation, marine freshwater biology) were also computed to assess the implication of different scientific communities in the transnational biodiversity and climate change research collaborations.

The second analyses using the in-depth criterion "Web of Science Categories" highlight the main categories out of 254 available in WoS platform that are relevant and interconnected with the major 4 research domains.

In addition, more filters from WoS platform were applied, in order to analyse more features of the biodiversity and climate change publications, such as: "Publications Titles", "Affiliations", "Authors" and "Financing Agencies".

Results

Results

Temporal trends of biodiversity and climate change publications

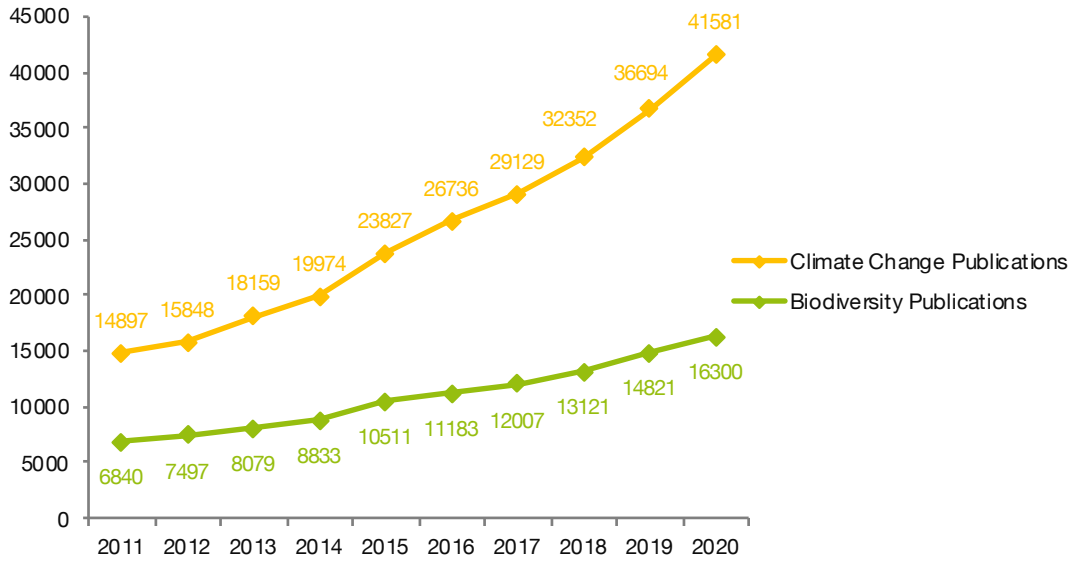


Figure 2. Yearly number of new scientific publications on biodiversity or on climate change

For the analysed period, 2011-2020, we retrieved **109,192** papers focusing on biodiversity and **259,197** papers focusing on **climate change**. The number of papers analysed based on keywords from each category increased steadily over the years (i.e. an increase of 138.30% for biodiversity and 179.12% for climate change between the start and end of the analysed time window) reflecting growing interest in research on these fields (Figure 2).

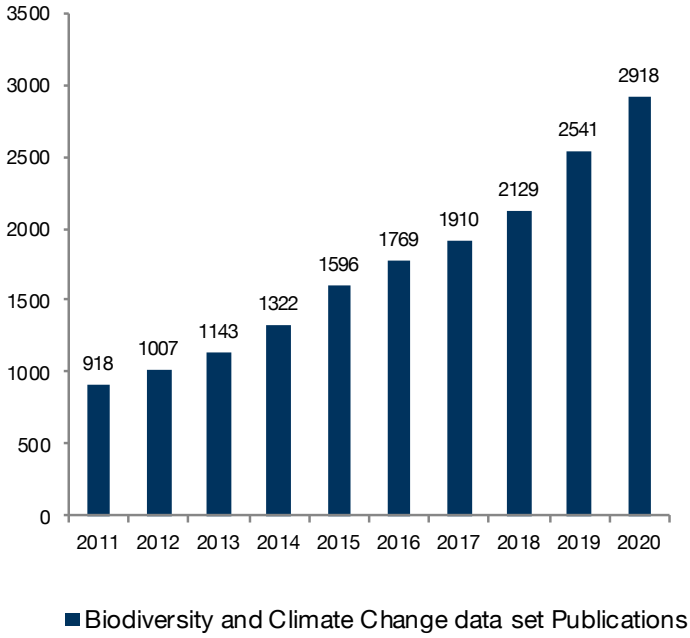


Figure 3. Temporal evolution of documents of the biodiversity and climate change publications. Analysis according to the criterion "Publication years"

The analysis of the biodiversity and climate change publications highlighted that 51.05% of these publications are open access documents, making them a very useful tool for bibliometric analyses.

A total of **17,252** indexed documents focusing on the interlinkages between biodiversity and climate change published over 2011-2020 were retrieved. There was a 217.86% increase between the start and end of the analysed time window, showing a growing interest in research at the interface between biodiversity and climate change (Figure 3).

Document types at the interface of biodiversity and climate change

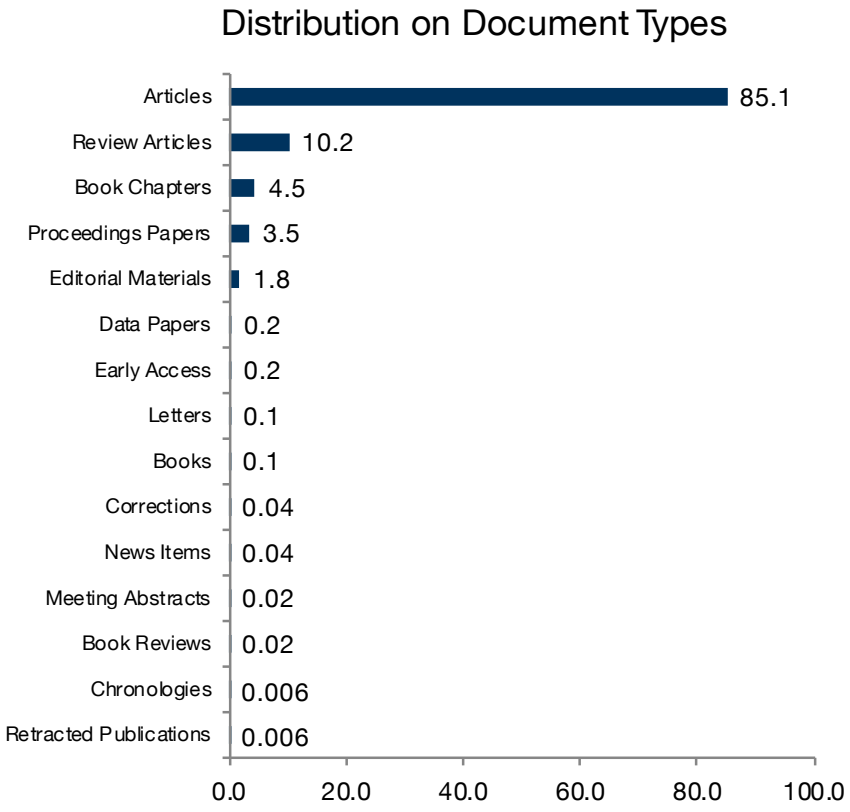


Figure 4. Distribution of biodiversity and climate change publications according to the criterion "Document Types"

The analysis according to the "Document Types" criterion highlights the authors' main preference to publish "articles" (original research papers) in journals; more than 85% of the papers are case study papers and another 10% are review articles which might be levers promoting interest in the interlinkages (Figure 4).

Main research domains and interdisciplinarity

Over the analysed period (2011-2020), publications at the interlinkages of biodiversity and climate change cover 122 "Research Areas" out of a total of 152 "Research Areas" available in WoS platform (i.e. 80.2%); and they are covering the "Research Domains" of Earth Sciences, Life Sciences, Technology, Social Sciences & Humanities.

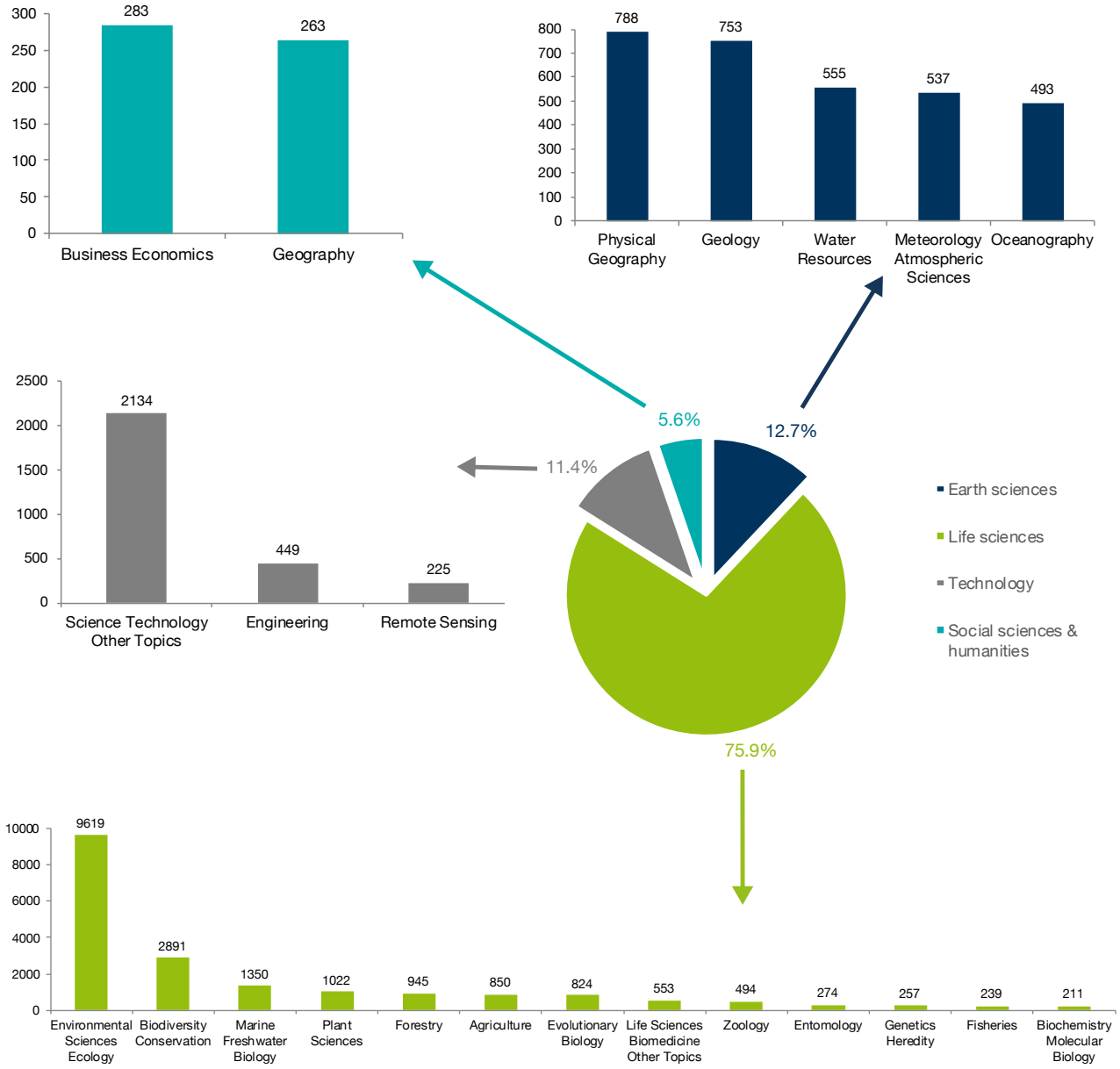


Figure 5. Distribution of biodiversity and climate change publications according to the major 4 research domains and research areas (topics)

Figure 5 shows the research domains and specific research areas (topics) covered by biodiversity and climate change publications between 2011 and 2020. Only research areas covered by at least 200 publications are included in this figure. Based on this analysis, there seems to be a predominance of publications (i.e. more then 75%) in the Life Sciences domain. For the Technology domain, the Science & Technology Other Topics stands out as main research areas. For the Earth sciences domain, both Physical Geography and Geology are most prominent. For the Social sciences and humanities domain, most publications cover Business Economics, but it should be noted that overall there are fewer publications linked to the Social science and humanities domain.

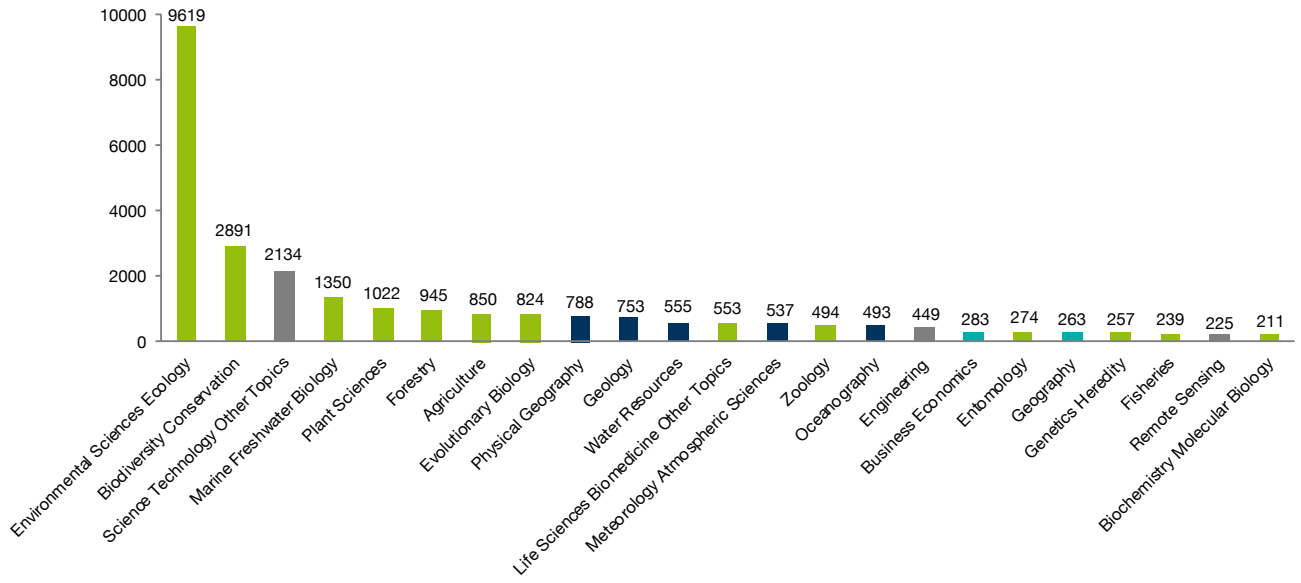


Figure 6. Distribution of the biodiversity and climate change publications according to the top 29 "Research Areas"

Figure 6 highlights the distribution of the biodiversity and climate change publications in relation to the top 29 "Research Areas", as well as to the major domains of which they are part. This figure reveals the weights, considering only those that reach at least 1% of biodiversity and climate change publications, within the research areas in which this data set results are framed. The research areas "Environmental Sciences Ecology" and "Biodiversity Conservation" hold the largest number of publications.

The second analysis conducted for the period 2011-2020, highlights that biodiversity and climate change publications (17,252) cover 182 "Web of Science Categories" (i.e.71.7% of all 254 categories available in Web of Science platform).

The 29 most relevant "Web of Science Categories" (i.e. with at least 1% biodiversity and climate change publications) are presented in Figure 7.

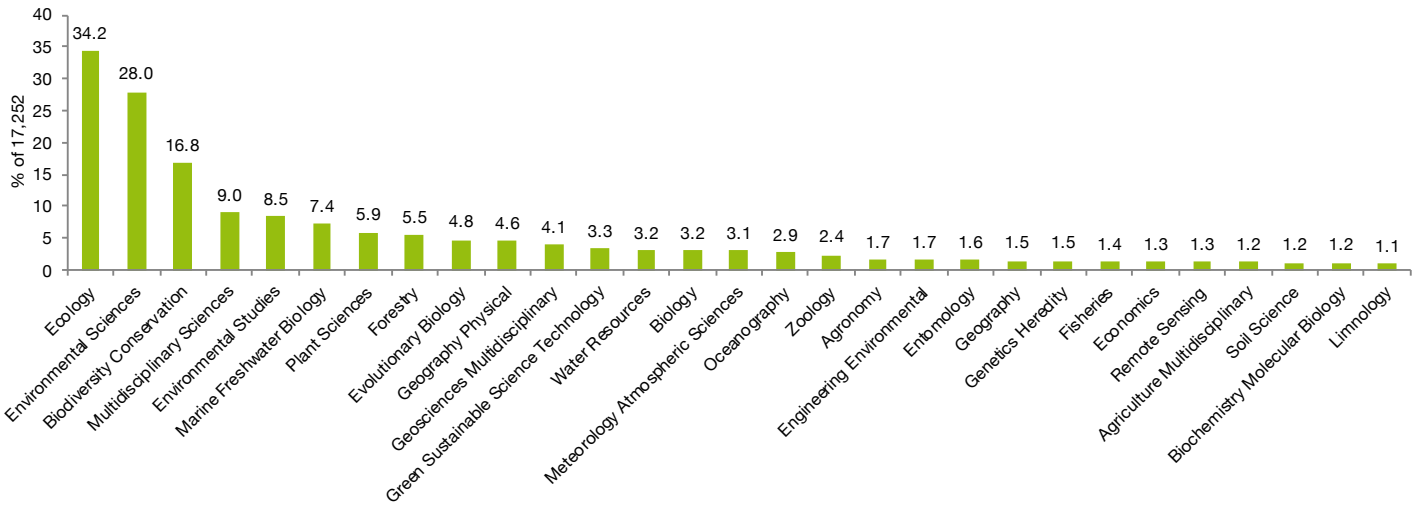


Figure 7. Distribution of the biodiversity and climate change publications according to Web of Science Categories

The distribution of the biodiversity and climate change publications (Figure 7) shows the weights of the most relevant research fields as Web of Science Categories. The research fields that are best covered are "Ecology", "Environmental Sciences", "Biodiversity Conservation"; these three research fields together cover more than 55% of biodiversity and climate change publications.

"Multidisciplinary Sciences", "Geosciences Multidisciplinary" and "Agriculture Multidisciplinary" exemplify the diversity of the research publications as well as their multi-disciplinarity. Moreover the presence of the "Green Sustainable Science Technology" category within the first half of the research fields reflects the increasing importance of sustainability research to support, for example, the European Green Deal [1].

Figure 8 displays the most relevant journals (i.e. with at least 100 biodiversity and climate change publications) publishing research on biodiversity and climate (Figure 8).

1. https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal_en

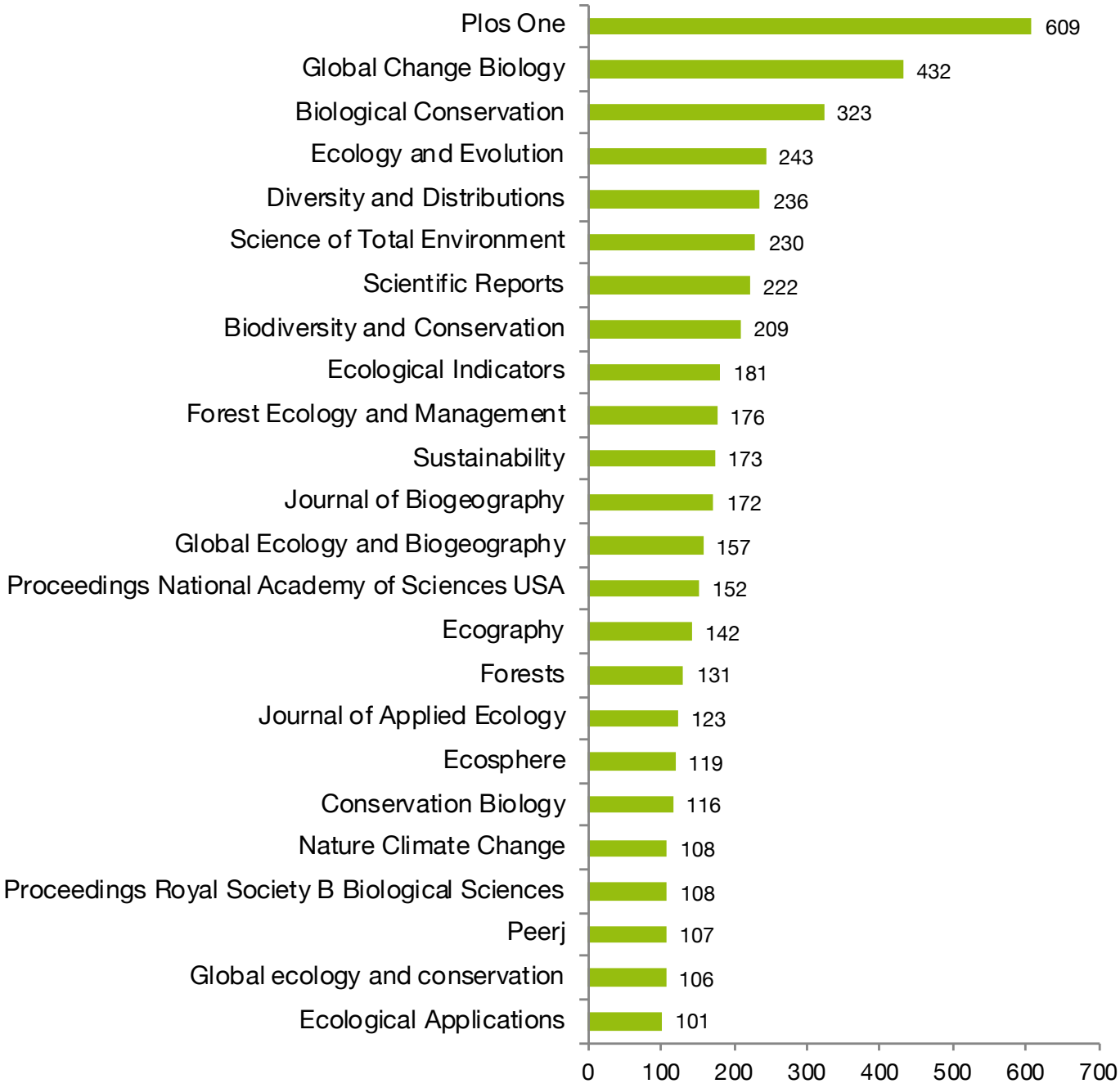


Figure 8. Distribution of the biodiversity and climate change publications by "Journal Titles"

The graph shows that most of the biodiversity and climate change papers were published in journals of which the top five have an impact factor between 5,349 and 25,29. *Plos One* (a multidisciplinary journal) is on the top of the list, followed by more topic-specific journals such as "Biodiversity and Conservation" (8th position) and "Nature Climate Change" (20th position). The average impact factor for the most relevant journals publishing research on biodiversity and climate change is 6,011.

Transnational collaborations

For the analysed period, 2011-2020, biodiversity and climate change publications are covering 188 countries from which the publications authors are mentioned (i.e. 89.6% of all 209 countries available in Web of Science platform).

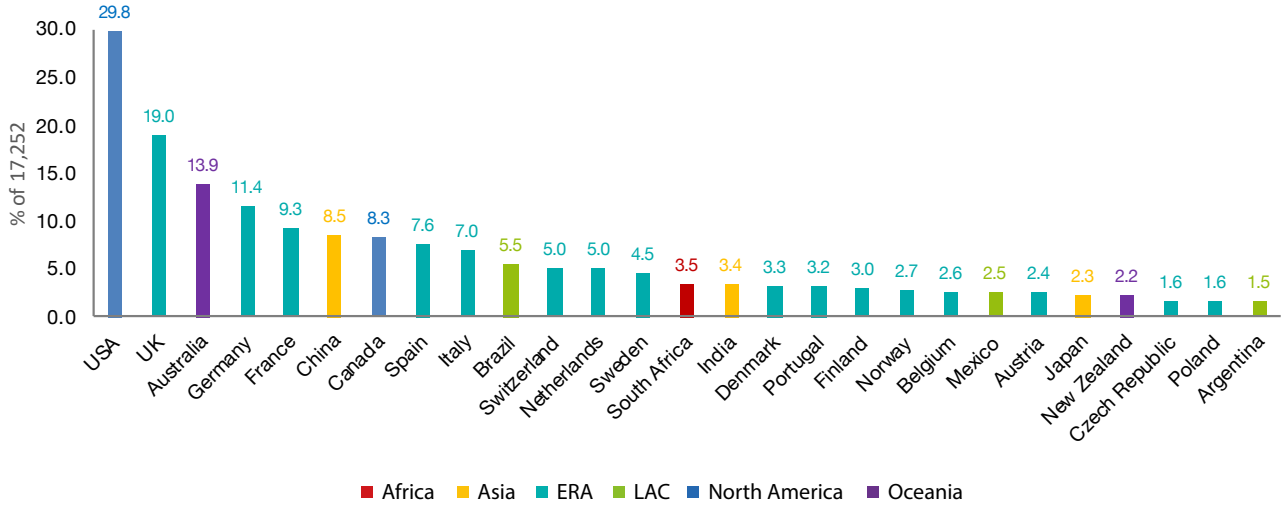
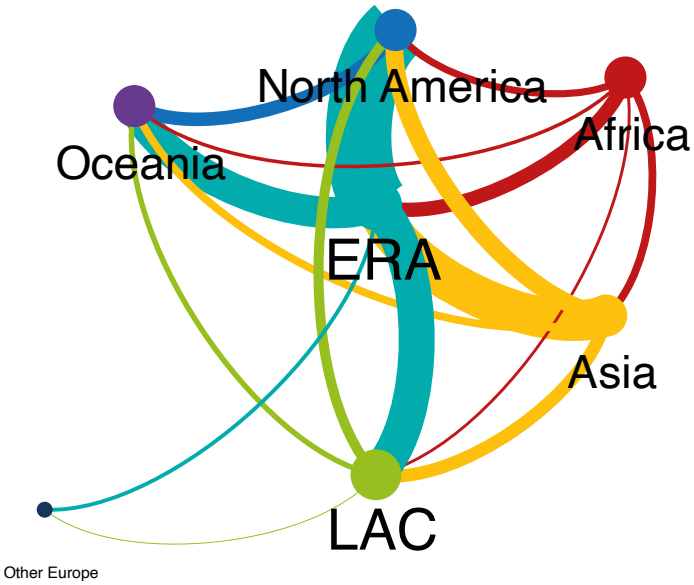


Figure 9. Distribution of the biodiversity and climate change publications per country (the 27 countries publishing at least 1.5% of the total dataset are shown) and World Regions.

Biodiversity and climate change publications are dominated by the USA, followed by the UK. Except for USA, the 16 most publishing countries are European. Overall, for the 2011 – 2020 period, 41% of the authors of biodiversity and climate change publications available on WoS come from the ERA and 22.5% come from North America. It is also interesting to highlight that 3.2% of the French publications on biodiversity and climate change come from OCT regions (French Guiana, Reunion, New Caledonia) and 2.8% of publications on biodiversity and climate change from Denmark come from OCT (Greenland & Faroe Islands).



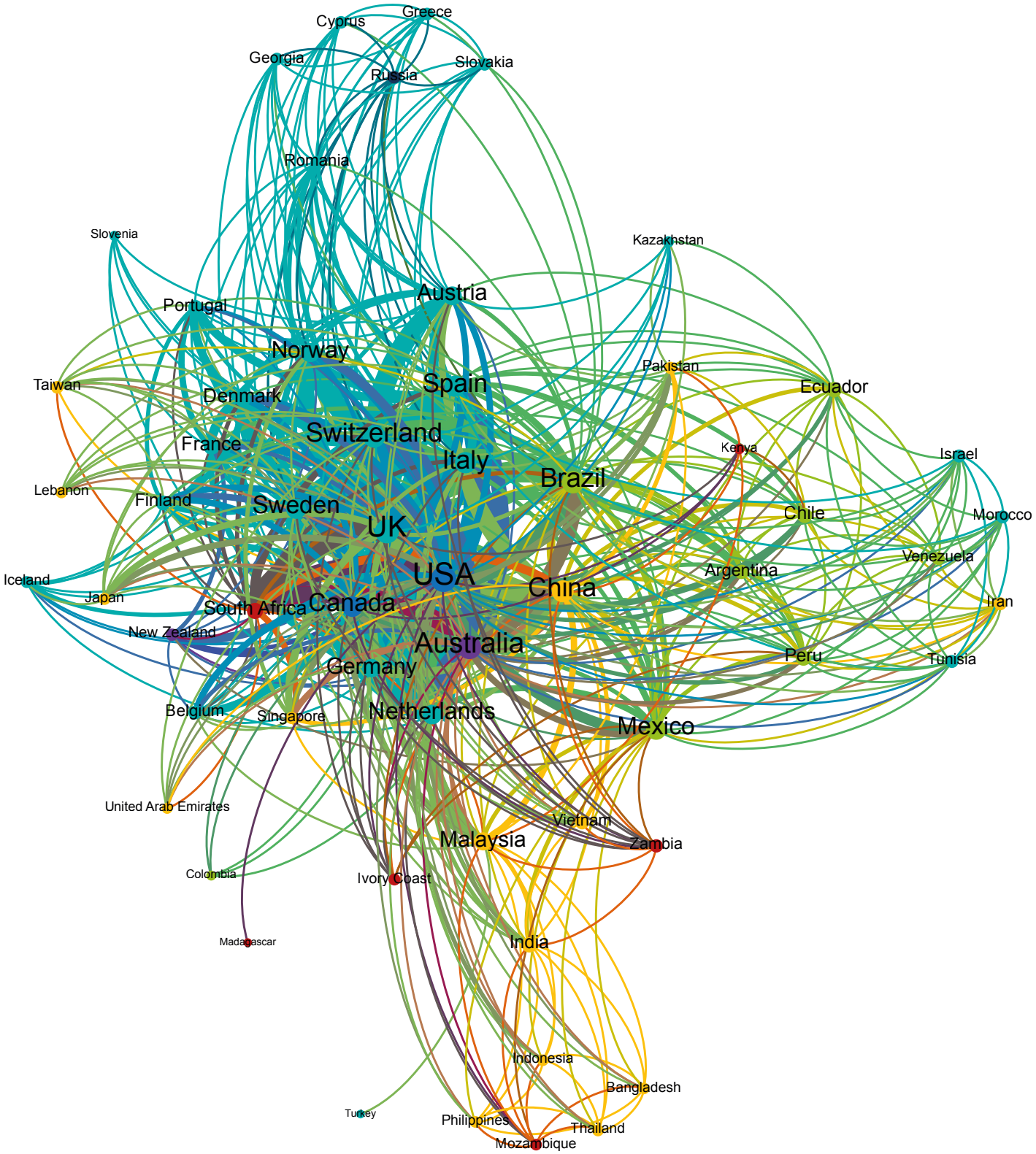


Figure 10. Cooperation network between countries from all world regions. Disc size corresponds to the weighted degree, which is the number of countries to which a country is linked, weighted by the number of publications represented by each link and visualisation of world regions research network

The publication network analysis was conducted for the 100 most cited biodiversity and climate change publications and revealed a strong cooperation between scientists from different world regions. The countries most involved in scientific collaborations include USA, Australia, United Kingdom, Canada and China (Figure 10).

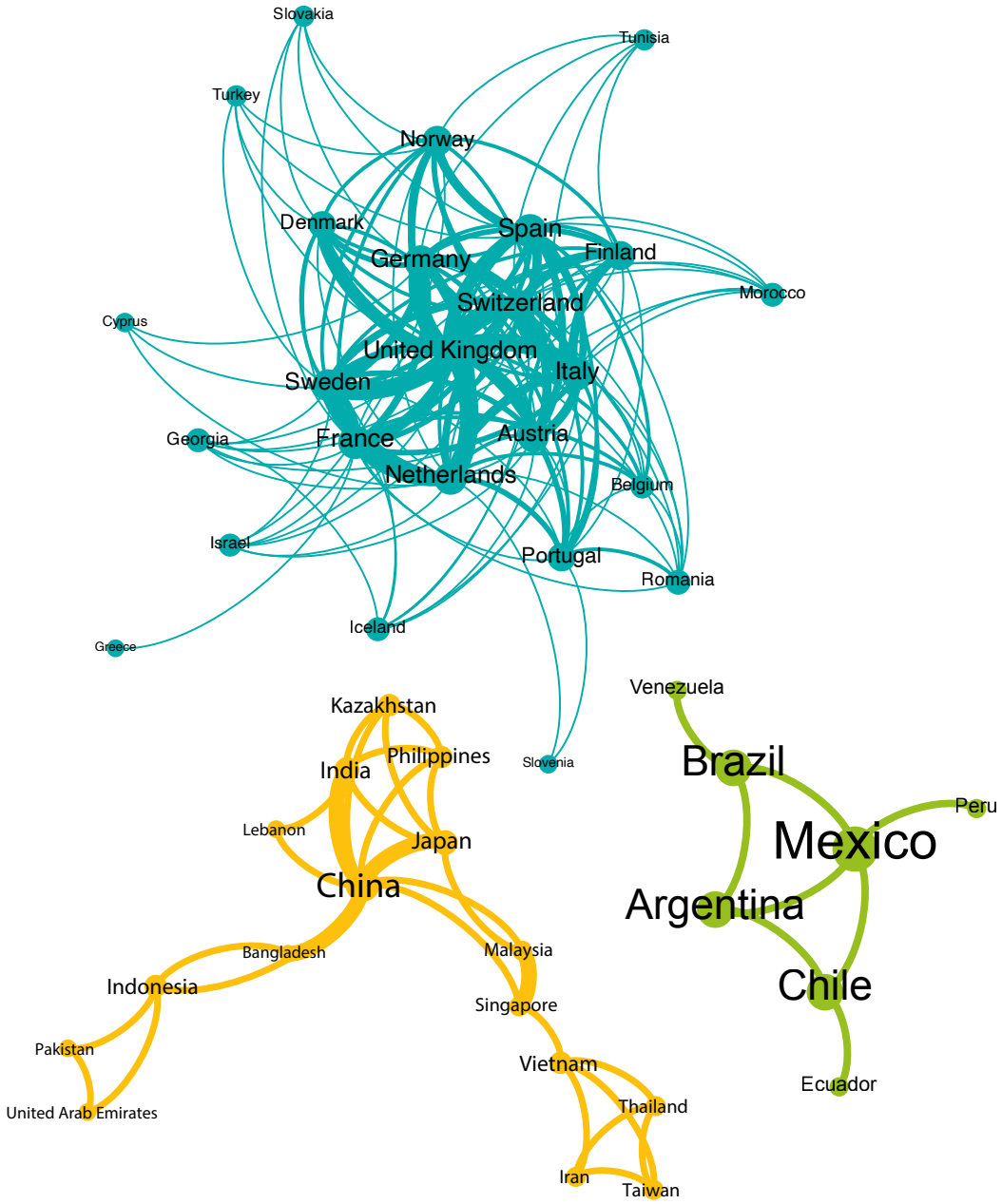


Figure 11. Intra-regional networks cooperation. Turquoise: collaborations within European Research Area countries. Orange: collaborations within countries from Asia. Green: collaborations within countries from the Latin America and the Caribbean.

Intra-regional networks were also analysed in terms of collaboration, by considering the 100 most cited biodiversity and climate change publications within ERA, LAC and Asia countries (Figure 11). Missing visual regional representations of the existing data do not indicate the absence of intracontinental collaboration; this specific form of visualisation is either (distinctly) irrelevant for the datasets with reduced number of categories / nodes (Oceania, North America, Other Europe), or the datasets are not representative, primarily because of the acknowledged filtering of most 100 cited publications. For Africa, among the 100 most cited publications on biodiversity and climate change, there were no collaborations between African countries, yet there were research collaborations with non-African countries. Figure 11 highlights the leading position of the United Kingdom, Netherlands, Germany, Spain and Sweden for the ERA; the leading position of Brazil, and to a lesser extent Mexico and Argentina for LAC; and leading position of China, Singapore, Japan and India for Asia.

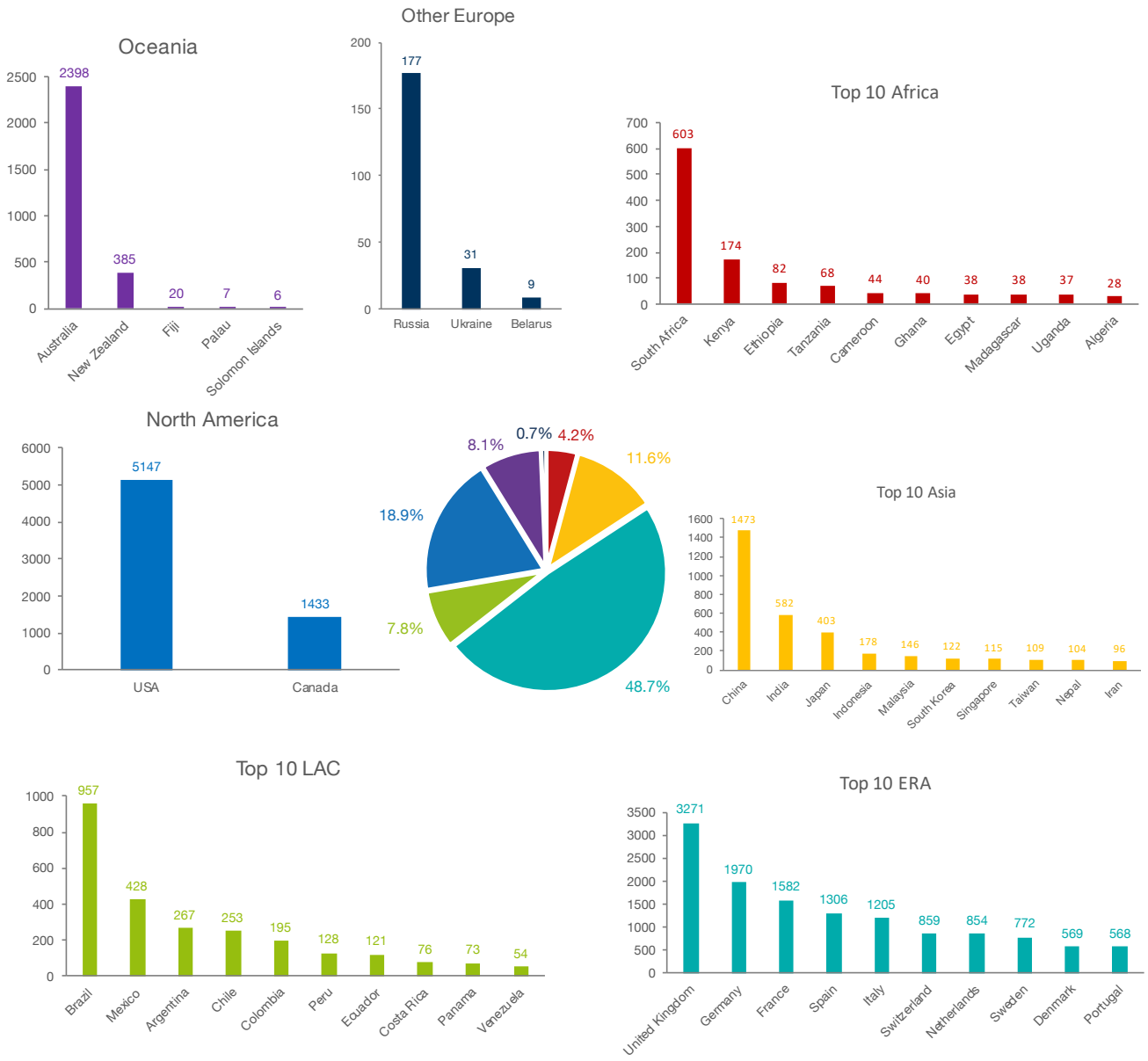


Figure 12. Distribution of the biodiversity and climate change publications according to world regions

At the regional level, Figure 12 shows that the highest percentage of biodiversity and climate change publications come from the ERA, followed by North America.

Main research organisations identified in publications focusing on biodiversity and climate change

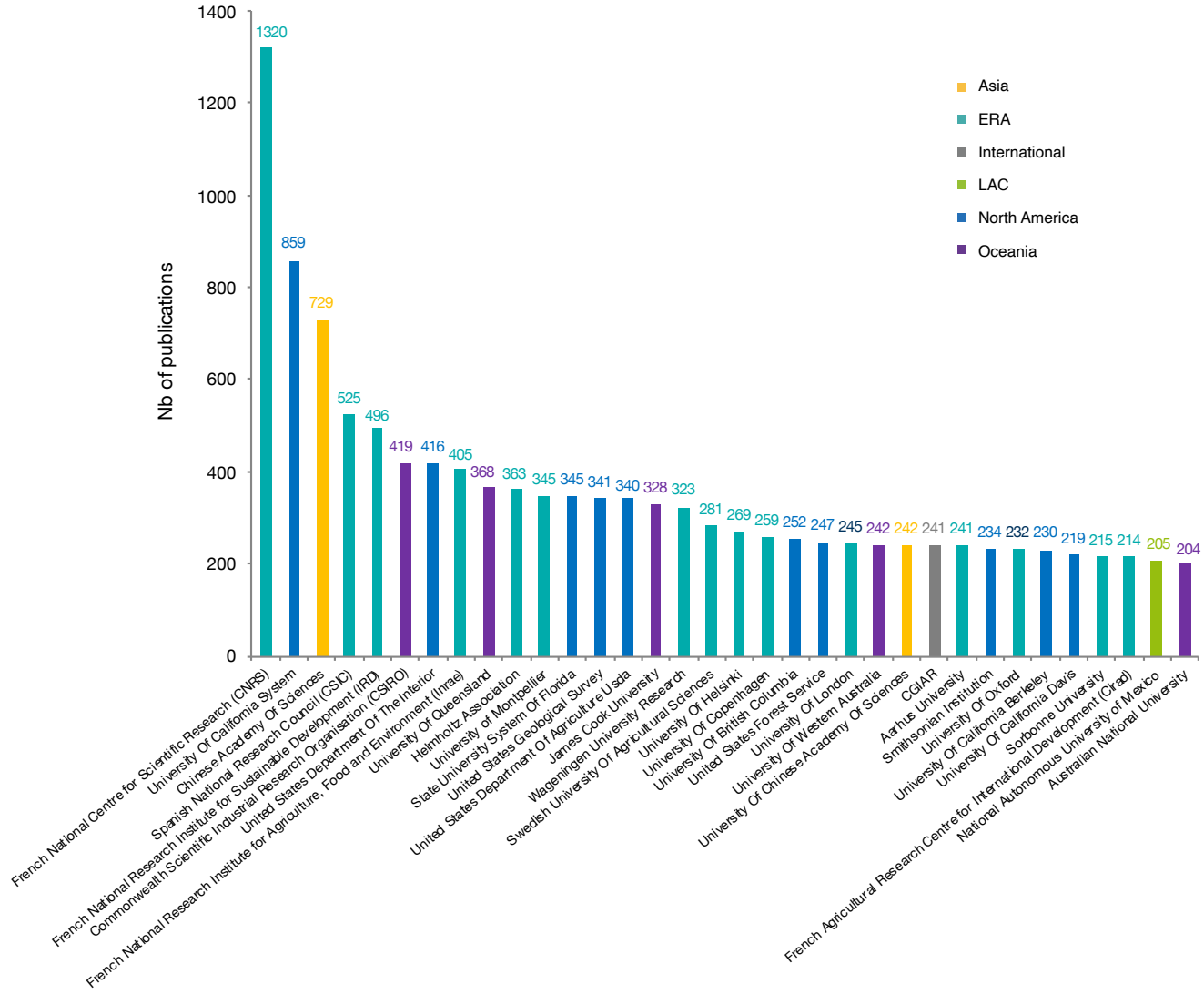


Figure 13. Distribution of the biodiversity and climate change publications according to "Affiliations" and world region (colours)

Figure 13 presents the number of publications according to institutional affiliation (producing at least 200 publications), and world region. French research organisations are often identified on biodiversity and climate change publications.

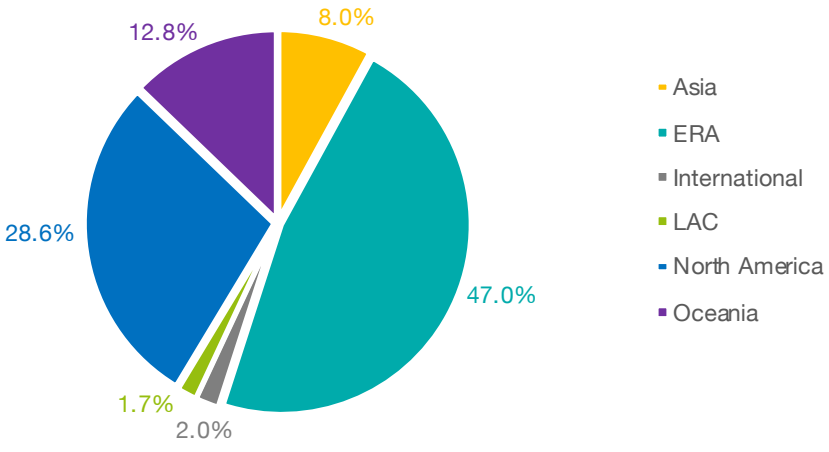


Figure 14. Distribution of the affiliations (publishing biodiversity and climate change publications) by world regions

The biggest share of scientific research publications with country affiliations come from the ERA and North America world regions (Figure 14) which could indicate both a higher interest and/or higher levels of capacity and resources.

Most visible authors

Figure 15 presents authors with at least 25 biodiversity and climate change papers published in the period 2011-2020, as well as their Hirsch Index – H-index (Scientometer).

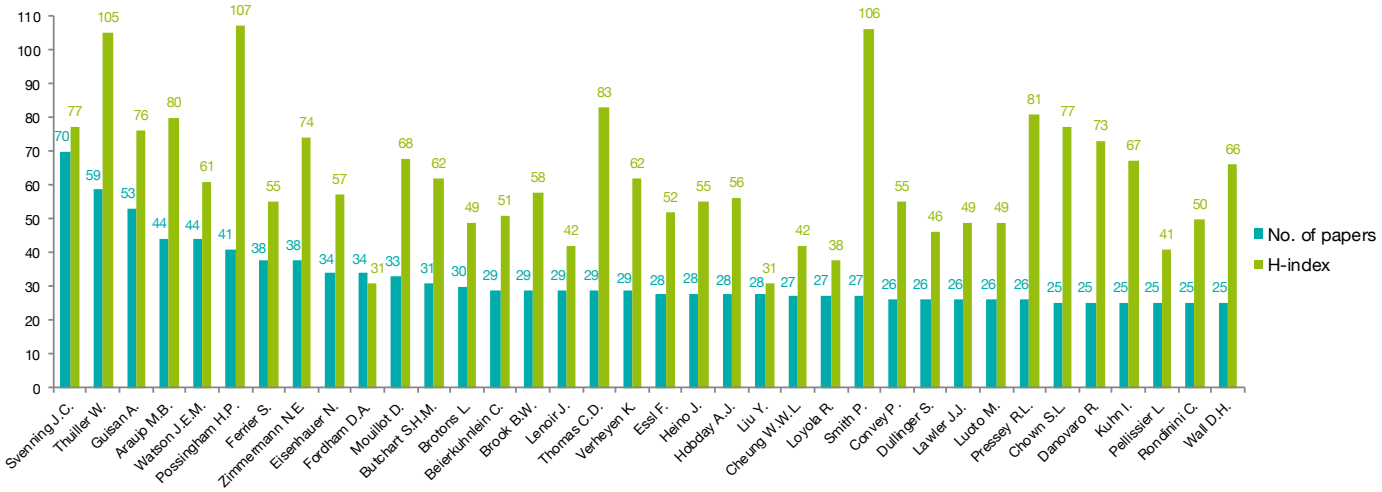


Figure 15. Distribution of most publishing authors on the topic of biodiversity and climate change

Funding sources

We can consider that the intersection of these two fields, biodiversity and climate change, represents a priority for funders. In the analysed period a total of 73.6% out of the 17,252 publications mentioned funding sources in their acknowledgement section, comparing with only 43.3% in section Web of Science Core Collection.

The 27 most named funding agencies are presented in Figure 16, and linked to a world region.

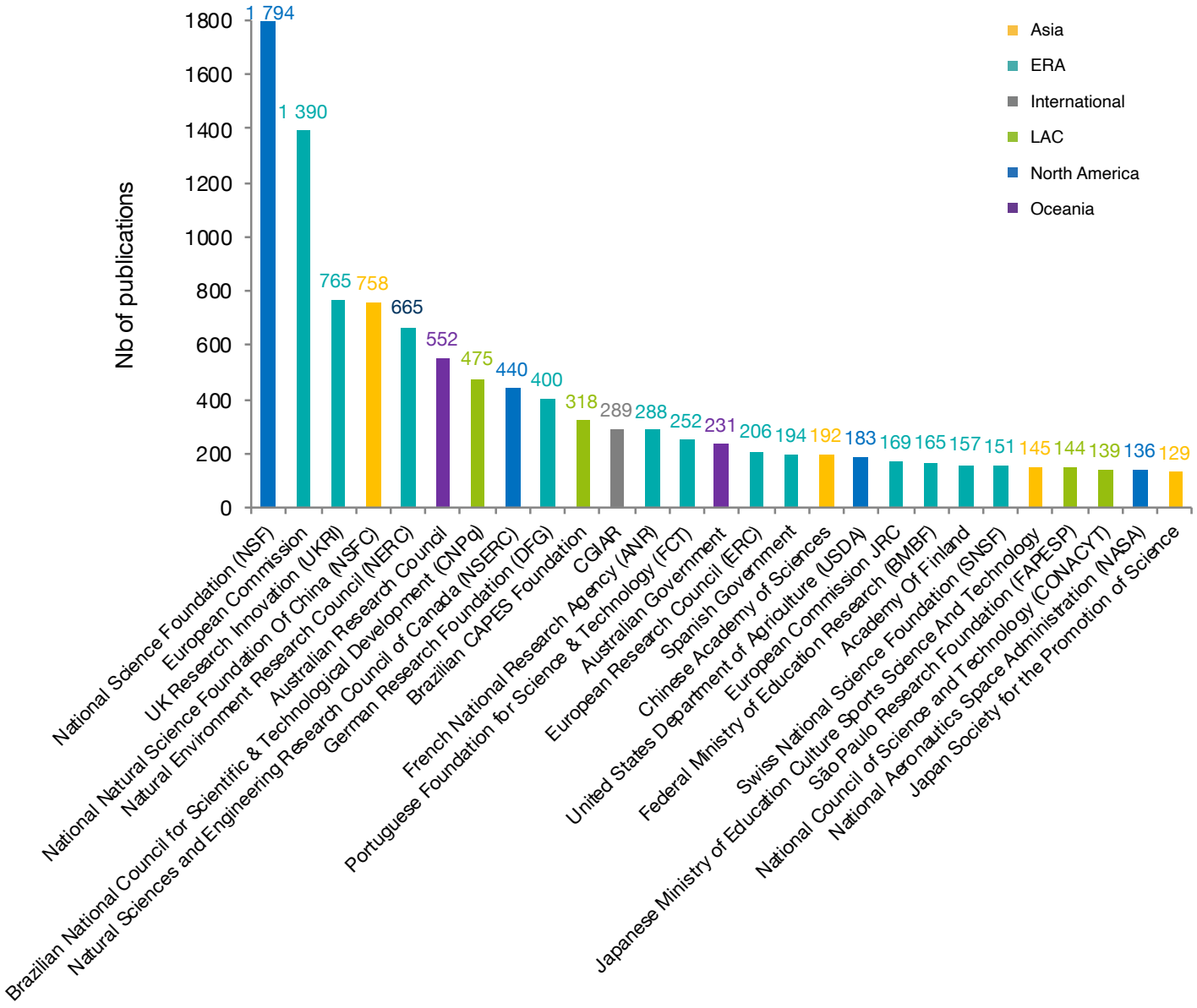


Figure 16. Distribution of the biodiversity and climate change publications according to the funding organisations and world regions (colours)

The analysis shows the top funding organisations that supported the highest number of biodiversity and climate change publications. First two of them, in terms of most acknowledged to support the biodiversity and climate change research, are the American National Science Foundation followed by the European Commission (Figure 16).

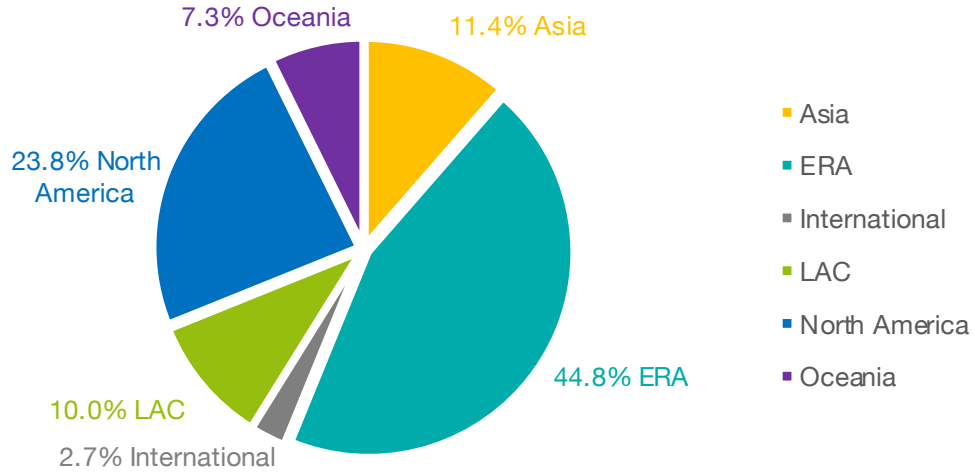


Figure 17. Distribution of the biodiversity and climate change publications according to funding agencies, and world region

At global level, funders from the ERA and North America support the largest share of biodiversity and climate change publications (Figure 17).

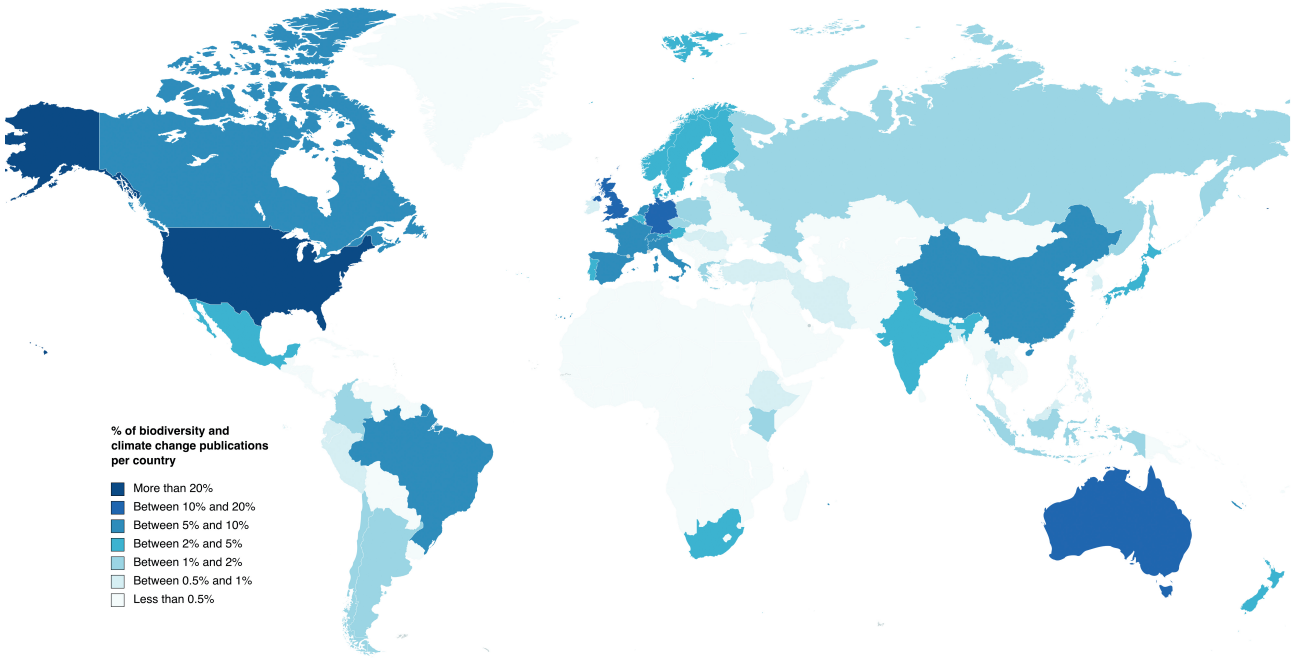


Figure 18. Visualisation of the quantity of biodiversity and climate change papers published by each country

Finally, in Figure 18, the shades of blue present the quantity of biodiversity and climate change papers published by each country. Highest scores are seen for North America with USA; South America with Brazil; the ERA with Germany and the United Kingdom; Africa with South Africa; Asia with China; Oceania with Australia and Other Europe countries with the Russia.

Keywords most used in biodiversity and climate change publications

Figure 19. Keywords featuring most in the biodiversity and climate change publications

Using "Most Cited Papers" (Highly Cited Papers or Hot Papers) filter, from Web of Science informatic platform, 435 results were generated (2.52% of which are biodiversity and climate change publications). Based on Word Cloud generator[2] and using article titles, keywords and abstract, the keywords featuring most in the publications include change, species, climate, soil, global, and effect. Other important keywords include: future, forest, extinct, community, predict, populous, need, time.

2. https://wordart.com

Conclusions

Conclusions

The volume of publications focusing on the interlinkages between biodiversity and climate changes analysed over the 2011-2020 period has steadily and significantly increased since 2011, which corresponds with increasing attention and political momentum in relevant conventions, the UN 2030 Agenda and more recently the EU Green Deal.

Although most biodiversity and climate change publications are focusing on the life science research domain, several other fields such as Earth science and social sciences, and including interdisciplinary ones (such as sustainability sciences) have also been covered.

The network analysis demonstrated a high level of scientific collaboration between world regions, with some forerunners (such as USA, UK, Canada and China). Also within regions, some countries (such as the Netherlands, Germany, Brazil, China, Japan) have higher levels of international collaborations then others.

The main funders of biodiversity and climate change research seem to be located in the ERA (including the European Commission) and North America. Key topics dealt with, as reflected by commonly used key words, relate to aspects of biodiversity status and dynamics, (climate) change, environments, impacts, scale and the future (scenarios and models).

This report focuses on a specific time window (snapshot) and analyses could be repeated and further extended in a later phase to compare trends, and reveal some new ones. For example, it can be expected that the link between research and (technological) innovation, especially in the context of the EU Green Deal, will become more and more important to tackle issues at the interface between biodiversity and climate change. This could imply both market uptake and policy innovation. Moreover, within the EU Green Deal, biodiversity and climate change are only two of the eight thematic policy areas, and it is to be expected that the research will become more and more trans-sectoral, trans- and interdisciplinary. We can expect to see better reflected the rise of Big Data, the use of innovative tools for collecting/sharing/analysing data including artificial intelligence, citizen science, social networks – and more.

Clearly, biodiversity and climate change research will become increasingly important to feed important science-policy platforms such as the Intergovernmental Platform for biodiversity and ecosystem services (IPBES) and the Intergovernmental panel on Climate Change (IPCC), and to support the implementation of the post-2020 global biodiversity framework and UN Agenda 2030. Biodiversa+ (the European Biodiversity Partnership) will therefore use the results of this mapping to reinforce those areas and disciplines that - so far - have not been (sufficiently) covered to fill knowledge gaps, and to mobilise funders from new countries to boost scientific collaborations. It would be interesting to further explore why research is lower in certain parts of the world and address key-factors concerning low results in countries mostly affected by climate change.

Reading this mapping you will...

... discover the main geographical research collaborations on biodiversity & climate change

... find out more on the trends on biodiversity & climate change research

biodiversa+
European Biodiversity Partnership

... discover the main funding sources funding research on both biodiversity & climate change

... learn about the main disciplines mobilised in biodiversity & climate change research

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