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The persistent global disparities in environmental and climate communication scholarship

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Introduction: As the climate crisis progresses, it is clear that environmental catastrophes are unequally distributed and unequally caused. The Global South is disproportionately affected by the consequences of climate change despite being less responsible for some of its anthropogenic causes, compared to the Global North.

Methods: To understand whether environmental and climate communication scholarship reflect the global nature of these crises, we conducted a publication review of 505 articles published in the top-producing journals of climate communication between 2020 and 2022, along with an authorship survey and keyword network analysis. We investigate who conducts environmental and climate communication research, the geographic focus and contextualization of the research, and the thematic focus of the research.

Results: The Global North dominates in authorship (93%) and research focus (67%), while the Global South affiliated authors make up a fraction of the sample (7%) and of the research focus (12%), revealing a gap in scholarship based in and about the Global South. While articles across the Global North and the Global South focused on climate change and adaptation, articles about the Global South more prominently focused on disasters, vulnerability, and risk management.

Conclusion: The review highlights the need for greater diversity in environmental and climate communication publishing and suggests consistent geographic naming practices in titles to achieve a more inclusive academy.

KEYWORDS

publication review, bibliometrics, global north/global south relations, academic inequalities, representation

1 Introduction

As climate change races on, it is evident that environmental catastrophes are neither equally distributed nor equally caused. As Newell (2005) establishes, the world can be divided into those who “generate most and benefit from wasteful and destructive patterns of resource exploitation” and those who “suffer the worst consequences of global environmental change and the social injustices” (p. 71). These negative consequences are concentrated in the Global South (IPCC, 2019), compounding the destruction caused by Western exploitation of ecosystems and natural reserves to meet the needs of industry in the Global North. Disadvantaged communities suffer from a “vicious cycle” of climate change, where initial inequalities increase their exposure to negative climate impacts and reduce their ability to respond effectively (Islam and Winkel, 2017, p. 2). Althor et al. (2016) conclude that the lowest emitting countries of greenhouse gasses, many of which are in the Global South, are the most vulnerable to adverse climate change effects compared to the highest emitting countries, such as the United States. Pezzullo and Cox (2021) call these disproportionate impacts of climate change from Global North actors a “cruel irony,” highlighting that the “voices of those most

affected by climate change are often not part of the conversation about solutions” (p. 272).

Moser (2016) asserts that climate change affects “everything and everyone across the globe,” and therefore effective communication about it should transcend disciplinary and geographic boundaries (p. 349). Similarly, Cox (2007) frames environmental communication as a “crisis discipline,” asserting that scholars have an ethical duty to actively engage with significant environmental crises. If this moral imperative applies across both disciplines, one should expect the scholarship to respond to the most urgent crises that are concentrated in the most vulnerable parts of the world. Thus, we should reasonably expect efforts to study communication around climate understanding, impacts, action, justice, mitigation, and adaptation to be equally concentrated in both the Global South and Global North, if not more so in the Global South. Pezzullo (2019) has advocated expanding from a focus on crisis to one of care, emphasizing the importance of “creatively articulating a collective, meaningful response or care to build a better world” (p. 60). Grounded in both the lenses of crisis and care, environmental and climate communication should foster connections and empower all people and, in all areas, to respond effectively to global climate challenges.

In this paper, we systematically examine peer-reviewed environmental and climate communication articles from five journals: *Climatic Change*, *Environmental Communication*, *Global Environmental Change*, *Science Communication*, and *WIREs Climate Change* across three years: 2020, 2021, and 2022. We explored where authors are affiliated, where the research is conducted, how authors geographically contextualize their research, and the prevalence and interconnectedness of keywords. In addition, we conducted a survey with the authors of the papers to gain a more accurate understanding of authorial identities and backgrounds.

2 Literature review

Over the past decades, the field of climate communication has seen a significant increase in publications (Ballantyne, 2016), as climate action, adaptation, and mitigation has become increasingly more urgent worldwide. According to Moser (2010), the field emerged from climate scientists producing reports aimed at effectively communicating the evidence of climate change. Since then, climate communication has distinguished its focus on public understanding, perceptions, and behaviors related to climate change; the role and effects of mass media and journalism in constructing climate change discourse; and strategies for enhancing public engagement, outreach, and advocacy on climate issues (Chadwick, 2017; Moser, 2010; Nisbet, 2017). In this respect, climate communication shares features with related communication fields like environmental communication, which emphasizes the practical and transformative ways people express, define, influence, and navigate their ecological relationships to the world with both human and nonhuman systems, elements, and species (Pezzullo and Cox, 2021, p. 13). With considerable overlap between the two fields, Chadwick (2017) writes that climate communication is inherently connected to environmental issues, as both disciplines offer insights that can mutually inform one another. Distinguishing environmental issues from climate issues is challenging, as phenomena such as biodiversity loss, resource consumption, and water and air pollution are all exacerbated by climate change (IPCC, 2022). Others find that climate change

dominates the discipline of environmental communication as a topic of inquiry due to the pressing and complex challenges it poses to humanity (Comfort and Park, 2018). Recognizing the inseparable relationship between climate and the environment with regards to both academic fields and real-world effects, this publication review examines articles from five journals, considering articles across both environmental and climate communication. We focus specifically on the 2020–2022 period, marked by significant scholarly discussions on diversity and institutional commitments to diversity, equity, and inclusion (e.g., International Communication Association, 2020; NCA Environmental Communication Division, 2020). This timeframe provides a valuable context for analyzing emerging trends and identifying potential trajectories in subsequent years.

2.1 Disparities in academic publishing

In the broader field of communication, Chakravartty et al. (2018) find that non-White scholars are underrepresented compared to White scholars in both publication and citation rates across twelve communication journals. In their sample, non-White authors also tended to publish more articles with race related keywords. Within the most highly cited scholars in communication research, Freelon et al. (2023) find that approximately 92% of first authors are White and 79% of first authors work in the United States. Similarly, in a review of all published research articles in the *Journal of Communication*, authors outside of the U.S. are largely underrepresented (Walter et al., 2018).

When considering who is publishing, it is also important to take into account scholars’ academic backgrounds and transitions, particularly in relation to the issue of ‘brain drain’. Basilio (2023) describes the publishing power, such as increased access to economic resources and opportunities for collaboration, that comes with scholars being affiliated in the Global North. As a result, researchers may move from the Global South to the Global North due to limited resources for science in their home countries and in search of the academic recognition that comes from being in the North. Other scholars have concluded that power differentials and structural inequities within academia and academic publishing may disadvantage researchers from low-income and Global South countries, often placing them in secondary or lesser authorship roles, particularly in collaborations with researchers from top U.S. universities (Hedt-Gauthier et al., 2019; Miles et al., 2022). The ‘brain drain’ can limit the diversity of perspectives in global academic discourse, particularly as English has become the de facto language of global science, to the point that publications in other languages often carry less prestige than English journals (Gotti, 2020). A serious consequence of this is that topics of academic concern are then prioritized by English speakers, and thus issues that may be important to non-English speaking countries are neglected (Bahji et al., 2023).

With growing concern over the inequities in environmental impacts, academia, and knowledge production, there is a need to investigate authorial representation in the environmental and climate communication literature. We begin by examining the researchers who are publishing in this field, exploring their affiliate institutions, geographic transitions, and the primary language in which they publish.

RQ1: Who is publishing environmental and climate communication studies?

Turning towards the discipline of climate communication, Moser (2016) concludes that climate change research is highly interdisciplinary and highly distributed. Others, however, question whether climate communication actually involves and reaches across geographic boundaries in recent years. In their review of climate communication research on media coverage, Mahl and Guenther (2023) observe that, though scholars are increasingly investigating media in a broader range of countries, there remains a dominance of studies focused on the Global North. Countries such as the United States (U.S.), the United Kingdom (U.K.), Australia, or Germany are receiving the largest share of scholarly attention, while Asian, Latin American, and African countries have been widely neglected (Keller et al., 2020; Mahl and Guenther, 2023).

Comfort and Park (2018) find that over half of the articles in their sample of environmental communication papers examined U.S.-based media messages. Similarly sized countries in the Global South, such as Brazil and India, appeared in less than 2% of the 529 studies (Comfort and Park, 2018). Agin and Karlsson (2021) also conclude a similar lack of national diversity. In a review of articles about climate change communication, they observe that over half of the articles in their sample come from North America and Europe, while Africa and South America make up less than 2% of their sample.

The lack of globally diverse focused research within environmental and climate communication raises concerns about the representation of research and authors beyond the U.S. and Europe. We then ask the following question of the research locale.

RQ2: Where is the geographic focus of environmental and climate communication studies?

The legacy of eurocentrism in academic publishing may not only affect the kinds of authors and regions represented in this sample, but also in how knowledge is geographically contextualized. In a systematic review of over half of million social science publications, Castro Torres and Albrez-Gutierrez (2022) find that articles on the Global North are systematically less likely to name the country the study is based in in the title, compared to articles on the Global South. They argue that these articles assume that their findings are widely generalizable because they are not localized, and thus, the findings describe universal processes (Castro Torres and Albrez-Gutierrez, 2022).

Considering these findings from social sciences broadly, we then examine where within an article (title, abstract, main text, or if at all), authors geographically contextualize their research.

RQ3: How and where do authors geographically contextualize their research?

Turning to the topics represented in the literature, Moser (2016) observes that climate communication scholarship has mainly focused on communicative processes like framing, messaging and language, as well as communication channels like media. Other scholars note that the typical climate communication paper is a qualitative content analysis of news media (Agin and Karlsson, 2021). In the field of environmental communication, Comfort and Park (2018) find that “climate change” was the most prominent keyword used in their sample, appearing 61% more frequently than the word “environment”.

In our last research question, we examine the themes and phenomena explored in journal articles to understand what environmental and climate communication scholarship focuses on.

RQ4: What is the thematic focus of environmental and climate communication studies?

3 Methods

3.1 Data collection

We conducted a publication review, keyword analysis, and author survey of environmental and climate communication articles published in 2020, 2021, and 2022 from five journals: *Climatic Change*, *Environmental Communication*, *Global Environmental Change*, *Science Communication*, and *WIREs Climate Change*. Our selection of journals was based on Moser’s (2016) systematic literature review, which identified the highest-producing peer-reviewed outlets for climate communication research. At the time of writing, Moser’s (2016) list was the only available comprehensive resource for guiding our analysis across environmental and climate communication. To our knowledge, no resource on the highest-producing journals of environmental communication articles has been developed yet. While we recognize that environmental communication encompasses a broader range of topics than just climate communication topics (see *Limitations*), climate change remains the dominant topic within the field (Comfort and Park, 2018). Three of the selected journals focus on broader environmental topics such as science communication, environmental communication, and environmental change, while the remaining two are dedicated to climate change. Thus, the articles in this sample are relevant to both environmental and climate communication.

In total, we manually screened over 1,800 articles across *Climatic Change* ($n = 893$), *Environmental Communication* ($n = 208$), *Global Environmental Change* ($n = 453$), *Science Communication* ($n = 104$), and *WIREs Climate Change* ($n = 166$) and selected 505 articles based on the inclusion criteria for our final sample size.

The selected sample encompasses both environmental and climate communication, incorporating papers that exclusively address each field, as well as those that explore their intersections. However, some of the included journals published articles beyond the environmental and climate communication discipline. To identify only those that represent relevant scholarship to this categorization, we independently reviewed all articles from the journals published over the three-year period. Articles were considered to constitute communication scholarship if they (1) dealt with a theory or concept from communication studies (e.g., framing, public opinion, norm activation theory), (2) their object of study fell into the realm of communication research (e.g., news coverage, mass media, social networking sites), or (3) if they engaged with communication scholarship in their background, literature review, or discussion. Articles were then considered to be environmental and/or climate communication scholarship if they fulfilled any of the prior three criteria and engaged with environmental concepts (e.g., wildlife, climate, natural disasters). Articles excluded from consideration were those rooted in a biological science perspective and/or used methodologies and analyses typically

associated with other disciplines of science (e.g., spatial analysis, climate mapping and monitoring, carbon sequestration).

3.2 Publication review

We created a codebook to record bibliometric data, including authorship and authors' affiliations, regional focus of study, and keywords (see *Data Availability Statement*) see [Supplementary material: Publication Review Codebook](#). Addressing RQ1, who is publishing in the field of environmental and climate communication, we code the first five authors of each paper for their institutional affiliation at the time of publication, as well as said institution's country, continent, and whether it is categorized as a Global North or South country (defined by the United Nations Organization for Women in Science for the Developing World).¹ For articles with more than five authors ($n = 66$), only additional authors' emails were recorded for the purpose of the survey. Turning to RQ2, where the geographic focus is, we code for the primary regional focus of the study. Where the region of focus is explicitly available, we code by country, continent, and whether it is located in the Global North or South. Articles that are not place-based, such as reviews or online-focused studies, were coded as such. To answer RQ3, how authors geographically contextualize, we identify the section in which researchers specify where their research took place, such as in the title, abstract, main text, or not at all. To answer RQ4, the thematic focus of the studies, we code the first five research keywords listed for each article by the authors. Inter-coder reliability was established through a random pilot sample. The average Krippendorff Alpha value of 0.87 indicates substantial agreement (Krippendorff, 2004). Each article in the data set was then coded by one of the co-authors.

3.3 Keyword analysis

To analyze the keywords collected in the publication review, we conducted a network analysis. Each keyword is considered a unique node, and edges between two nodes thus represent a connection or overlap in research focus between the articles they were included in. The resulting graph is unweighted, undirected, and features a high number of triadic closures due to the edges between the up to five keywords listed by the same article (Monge and Contractor, 2003; Wasserman and Faust, 1994). We use open-source tools R² and RStudio³ and the packages *sna*⁴ and *igraph*⁵ to calculate standard measures of analysis for the structure of the graph and node attributes. Betweenness centrality was used to identify nodes holding unique positions in the network by connecting otherwise unconnected subsets; average degree to identify important, well-connected nodes; and Eigenvector centrality to consider the importance of a keyword based on its connections to other keywords (Monge and Contractor,

2003). Visualizations were rendered using the network visualization tool Gephi.⁶ Also using Gephi, we examine the network's community structure using modularity calculations. Modularity considers to what extent a network is made up of distinct clusters (Moody and White, 2003).

It should be noted that keyword networks represent object networks. This means that certain measures, such as Eigenvector centrality, should be analyzed with caution: As the nodes in this network are objects, they do not actively exert influence over other keywords. The measures can nonetheless point to central or important nodes in the network.

3.4 Author survey

We conducted an authorship survey to get a deeper understanding of authors' nationality, educational background, and demographic information.^{7,8} Although we collected information about authors' institutional affiliations through the publication review, this provides limited insight to authors' identities. Algorithmic name-based inference techniques to understand race and gender tend to introduce biases, such as underestimating Black authors when using set thresholds (Kozlowski et al., 2022). Instead, we asked authors to self-report. We collected the emails supplied by authors in each journal article and supplemented contact information with publicly listed institutional email addresses where applicable, as not all authors had publicly listed email addresses. The survey was sent to 1,300 out of 1,492 unique authors in the sample (87% of the sample).

The online survey questionnaire consisted of questions regarding racial, gender, ethnic, and national identity, as well as their educational background (see *Data Availability Statement*) see [Supplementary material: Author Questionnaire](#). Two surveys, each containing the same questions, were then distributed to first authors only and co-authors. This allowed us to understand whether there were potential differences in authorial identities between first authors and co-authors. The co-author sample includes some author overlap, as 60 authors were listed as a first author on one article and listed as a co-author on an additional article. Survey responses were collected from July 18, 2023 to August 8, 2023, with a reminder request sent on July 31, 2023.

The first author-only survey was sent to 455 unique email addresses and yielded a 33% response rate. The co-author survey was sent to 907 unique email addresses and yielded a 27% response rate. Response rates were either above or within the average response rate for email surveys, which typically ranges from 20–30%, and thus deemed suitable for analysis (Menon and Muraleedharan, 2020).

1 <https://web.archive.org/web/20240307182711/https://owsd.net/sites/default/files/OWSD%20138%20Countries%20-%20Global%20South.pdf>

2 <https://www.r-project.org/>

3 <https://posit.co/download/rstudio-desktop/>

4 <https://cran.r-project.org/web/packages/sna/index.html>

5 <https://r.igraph.org/>

6 <https://gephi.org/>

7 The study was approved by the Institutional Review Board at Cornell University. An informed consent agreement was provided on the first page of the online survey.

8 Due to institutional review board regulations and U.S. sanctions, we were unable to solicit responses from residents of any of the following countries/territories [Cuba, Iran, North Korea, Syria, Venezuela, Crimea region of Ukraine, Luhansk People's Republic (LNR), and Donetsk People's Republic (DNR)].

Responses were collected anonymously and not linked to the bibliometric coding data to ensure participant privacy.

4 Results

4.1 RQ1: authorship

Answering RQ1, the review reveals that of those publishing environmental and climate communication articles between 2020 and 2023, an overwhelming 93% of authors are affiliated with Global North institutions (see [Supplementary Table 1](#)). In contrast, the proportion of authors affiliated with institutions in the Global South remains largely constant across the first five authorial positions between 6 and 7%.

There is considerable difference in the number of articles produced by authors affiliated with Global South institutions across the journals in the sample. Both *WIREs Climate Change* and *Science Communication*, did not publish any work by authors affiliated in the Global South in two out of the three years we surveyed. However, both journals published fewer articles compared to these others in the three-year sample.

Cross-regional authorship collaborations, as well as authors holding affiliations with institutions in both the Global North and Global South, were infrequent in the sample. Among first authors, only nine individuals listed affiliations in both Global North and Global South institutions. Of the articles with multiple authors ($n = 404$), only 5% involved collaborations between authors from both Global North and South institutions. *Global Environmental Change* featured the highest number of cross-regional collaborations with 13 articles out of the 24 articles (54%), while *Science Communication* or *WIREs Climate Change* did not feature any cross-regional authorship collaborations.

Turning our analysis to the continent, most authors in the sample are affiliated with institutions based in Europe (43%), closely followed by North America (40%). Authors affiliated with institutions in Oceania or Asia are less prevalent, constituting around 9 and 7%, respectively. Only 1% of authors, each, hold primary affiliations within Latin America or Africa (see [Table 1](#)). This pattern remains constant across the first five authorship positions.

Narrowing at the country level, the U.S. stands out as the most represented individual country of affiliation with 523 authors (35%). It is followed by the U.K. with 217 authors (15%), Australia with 109 authors (7%), and Germany with 91 authors (6%). In contrast, numerous Global South countries are represented only once in our sample in terms of authorial affiliation, such as Zimbabwe, Bangladesh,

Cambodia, and Togo. Among Global South nations, China has the highest representation with 36 authors (2%).

Considering the results from the authorship survey, women were slightly more prevalent (53%), compared to men (42%) among first author survey respondents (see [Table 2](#)). However, this pattern nearly reversed among co-author respondents. Overall, White authors predominantly comprised the respondent samples at 78%.

Examining the relationship between educational background and nationality reveals a trend where North American respondents predominantly maintain their academic and professional ties within North America (see [Figure 1](#)). A similar pattern emerges for respondents in Europe and Oceania, although in smaller numbers. This suggests a tendency for individuals from Global North countries to remain within their regional sphere, completing undergraduate education and affiliating with institutions within the same region. In contrast, several respondents from Global South countries undergo a distinct shift from their undergraduate institutions to their current affiliations, transitioning to institutions in the Global North. For example, 67% of author respondents from Asia pursued their undergraduate studies in Asia, but are now affiliated with institutions across North America, Western Europe, or Australia. Notably, there are no respondents from African nations who completed their undergraduate education in Africa and remained there; instead, they gained affiliation across Asian, European, and North American institutions.

Lastly, authors indicated their native language and the language that they primarily publish in. Across the first author-only and co-author samples, a majority reported English as their native language (62%), followed by German (11%), Chinese (4%), Swedish (3%), and Dutch (3%). These four languages together represent 80% of the native language diversity, out of a total of 42 languages. While already dominated by Anglo-European languages, the picture becomes even less diverse once we turn to authors' primary language of publication: Overall, nearly all authors (97%) indicate that most of their work is published in English.

4.2 RQ2: geographic research focus

Over half of the sampled articles (57%) studied the Global North. The other half of the articles, however, is not taken up by research focused on the Global South: This represented only 12% of the articles in our sample. Among the Global South focused articles, China led the focus with 36% ($n = 22$ articles), followed by India with 26% ($n = 16$). The remaining articles studied both the Global North and South (6%), or were not location specific, such as literature reviews

TABLE 1 Primary institutional affiliation by continent and authorship position.

	Europe	North America	Oceania	Asia	Latin America	Africa
First authors (%)	215 (43)	205 (41)	43 (9)	33 (7)	3 (1)	6 (1)
Second authors (%)	171 (42)	163 (40)	35 (9)	29 (7)	6 (1)	4 (1)
Third authors (%)	121 (43)	106 (37)	30 (11)	23 (8)	2 (1)	1 (0)
Fourth authors (%)	81 (45)	72 (40)	12 (7)	13 (7)	2 (1)	2 (1)
Fifth authors (%)	46 (43)	46 (43)	8 (7)	5 (5)	2 (2)	0 (0)
Total (%)	634 (43)	592 (40)	128 (9)	103 (7)	15 (1)	13 (1)

TABLE 2 Demographics of survey respondents.

	First authors (<i>n</i> = 148)	Co-authors (<i>n</i> = 243)	Total (<i>n</i> = 391)
Gender			
Male	62 (42%)	134 (55%)	196 (50%)
Female	79 (53%)	101 (42%)	180 (46%)
Non-confirming/Nonbinary	7 (5%)	4 (2%)	11 (3%)
Prefer not to answer	0 (0%)	2 (1%)	2 (1%)
Race			
White	117 (79%)	186 (77%)	303 (77%)
Black	2 (1.35%)	6 (2.47%)	8 (2.05%)
Asian	14 (9%)	15 (6%)	29 (7%)
Latino/Latina/Latinx	2 (1%)	5 (2%)	7 (2%)
Indigenous Native and/or Pacific Islander	1 (<1%)	1 (<1%)	2 (1%)
Mixed	5 (3%)	8 (3%)	13 (3%)
Prefer not to answer	7 (5%)	14 (6%)	21 (5%)
Other	0 (0%)	6 (2%)	6 (2%)

“Other” category includes self-reported races such as: European, Mediterranean, Jewish, etc.

and reports (13%), online research (4%), theoretical articles (2%), fiction work (2%), or were simply not specified (4%), despite the study being clearly situated in a specific geographic location (*see RQ3 below*).

Examining regional breakdowns by journal, we see that North America and Europe dominate research focus across all journals (*see Figure 2*). In keeping with its global scope, *Global Environmental Change* stands out for featuring the highest proportion of articles concentrated on the Global South compared to the other journals, with 16% of articles based in countries across Latin America, Asia, and Africa. Notably, *WIREs Climate Change* only publishes review-type articles that synthesize existing research. Most of these review articles focus on broad themes without a specific focus, though there were some exceptions in which the reviews were specifically contextualized to a region.

Turning to the relationship between the location of authors and their research focus, we see that authors affiliated with Global North institutions tend to study the Global North, at 61% (*see Figure 3*). In a similar vein, Global South-affiliated authors are studying the Global South at 74%, although Global South-affiliated authors only make up 6% of the authors in the sample. In terms of cross-regional research focus, authors from the Global North are studying the Global South at 8%, while authors from the Global South are studying the Global North at less than 1%. We also see that authors affiliated in the Global North leading the production of articles that are not geographically focused, such as reports and reviews, online focused studies, and theoretical work.

4.3 RQ3: geographic contextualization

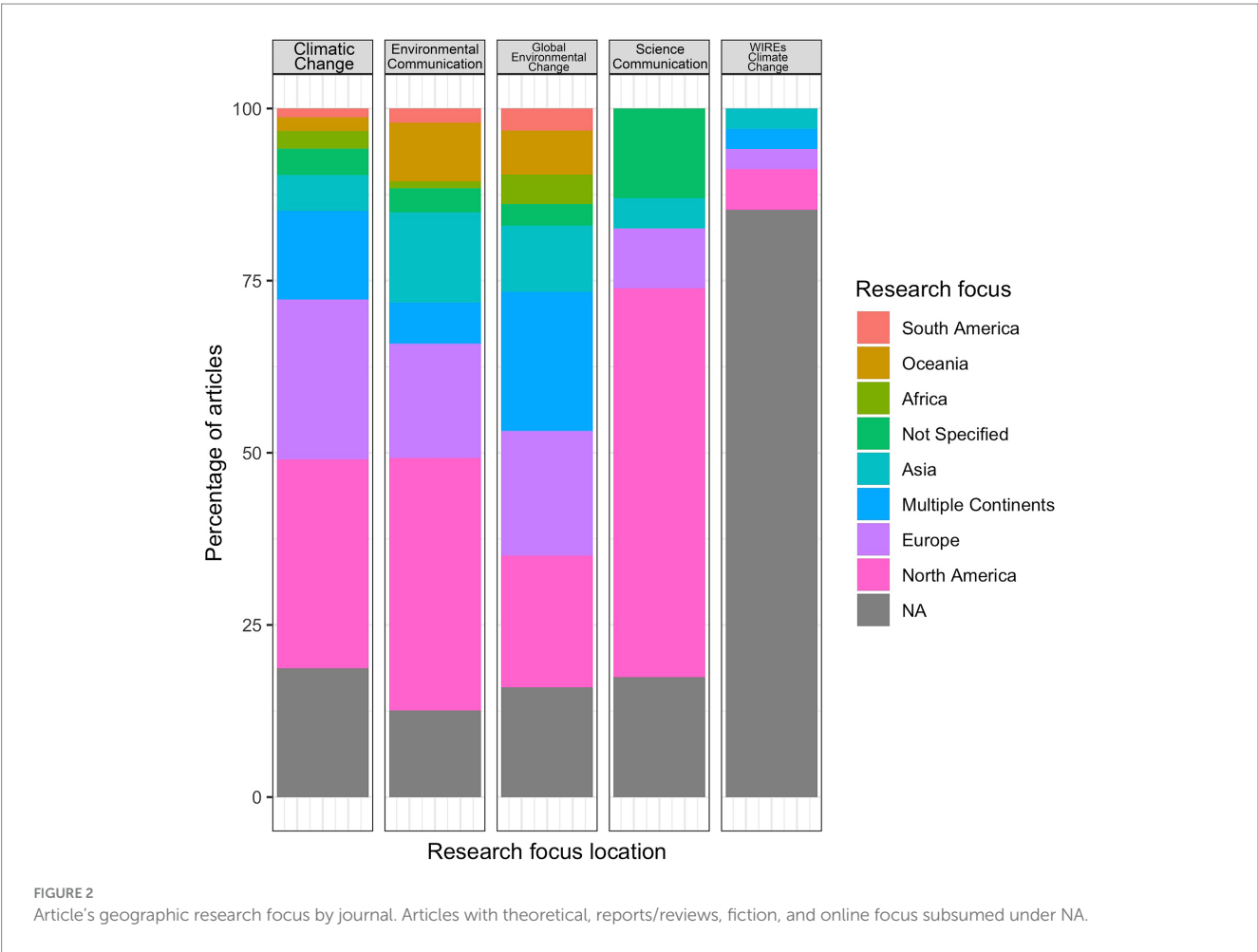
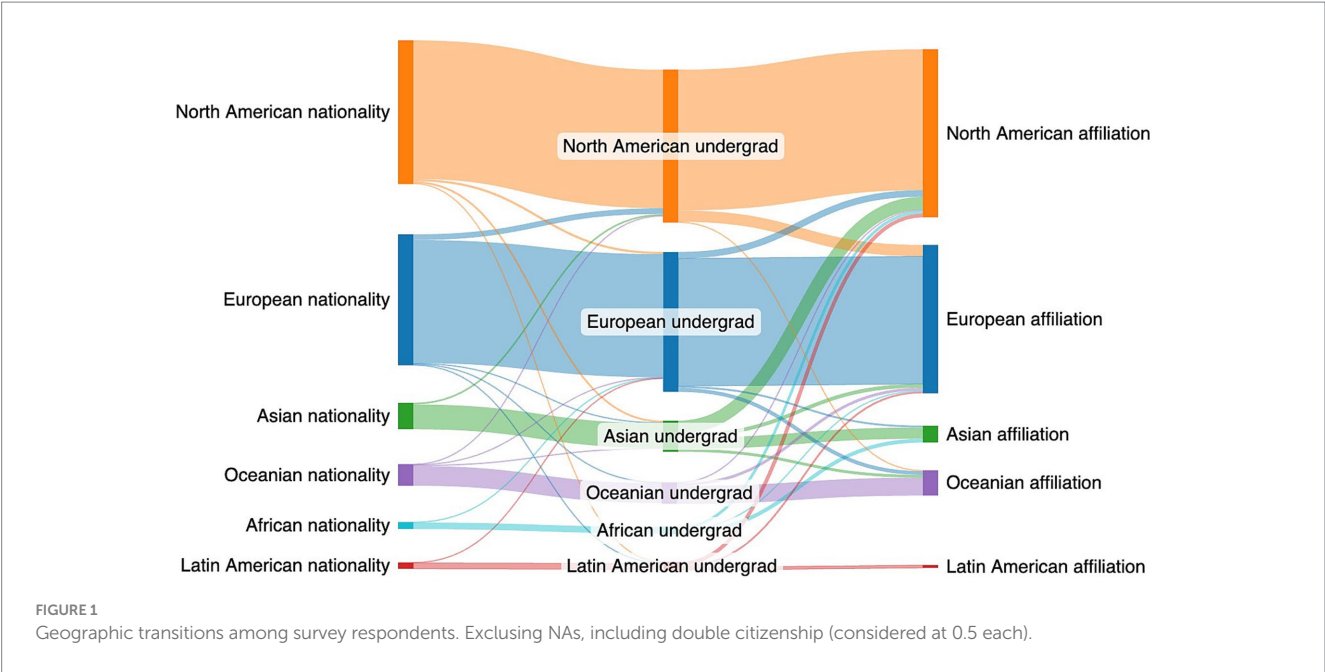
Addressing RQ3, there are discrepancies in the naming practices between place-based research focused on the Global North and in the Global South (*see Figure 4*). For Global North focused articles, 38% state the location in the title, 37% in the abstract, and 25% in the main text. In contrast, most articles focused on the Global South specified the location of their study in either the title (70%) or abstract (23%). Within this sample,

there were 20 articles that did not provide explicit indication of their study location anywhere in the article. Of these 20 articles, 19 were produced by a Global North authorship team. Often, implicit localizations were present, such as surveying “Republicans” and examining “Fox News,” which gave us indications that the articles were place-based, despite the lack of clear geographic markers.

4.4 RQ4: thematic focus

The analysis of the undirected keyword network shows that, overall, the sampled articles’ research focus centers around climate change (degree of 446), meaning it is connected to every third node in the network, and just its immediate ego-network accounts for 33% of the overall keyword network. [Table 3](#) identifies that climate change plays the central role in linking different groups in the network, even when discounting other variations of the keyword such as climate change communication (itself high-ranking) or climate change litigation (*see Supplementary Table 2*). Climate change functions as the most connected keyword across all three subsets of the network (*see Supplementary Table 3*), and acts as an important broker between Global South-authored papers, Global North-authored papers, and Global North/Global South collaborations. Within the Global North network, there is a broad thematic spread, engaging with methodological and academic meta-discursive keywords like framing and environmental communication. In comparison, the collaborative and Global South-only network does not include any field-denoting keywords such as environmental, science, or climate change communication. Instead, these networks focus on implications of climate change (disasters, extreme events, vulnerability), as well as localized topics like China. Adaptation appears in both Global North- and Global South- authored articles, indicating that there is a portion of articles across the globe that are solutions-oriented.

The network’s average clustering coefficient indicates how closely connected the neighbors of a keyword are to each other. [Figure 5](#) visualizes the clustering of keywords across three subnetworks (Global



South only, Global North/South collaborations, and Global North only). The network's average clustering coefficient of 0.866 [0,1], indicates that certain keywords appear in strong, tight-knit immediate neighborhoods—that is, certain subgroups of keywords are often named in the same article. In other words, articles generally focus on a narrow range of closely related topics, rather than covering a broad

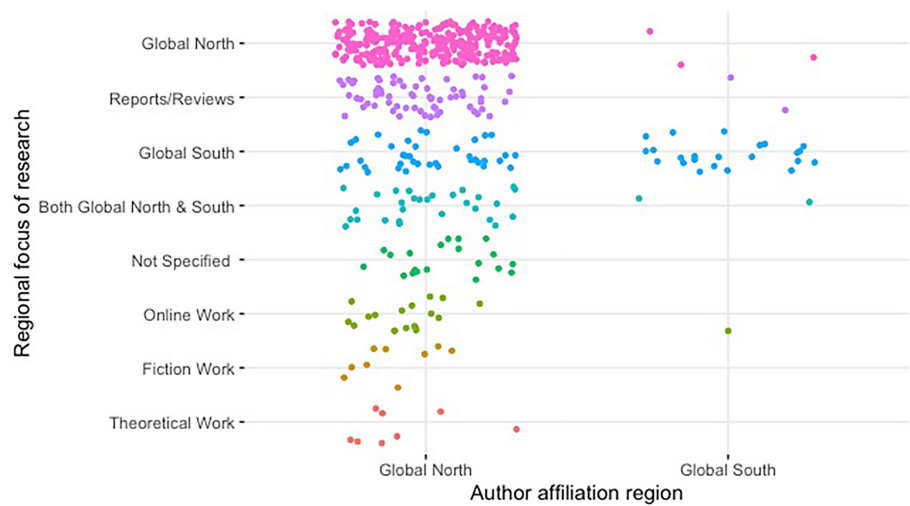


FIGURE 3
Article's research focus by authors' affiliate location. Excluding global north/global south collaborations.

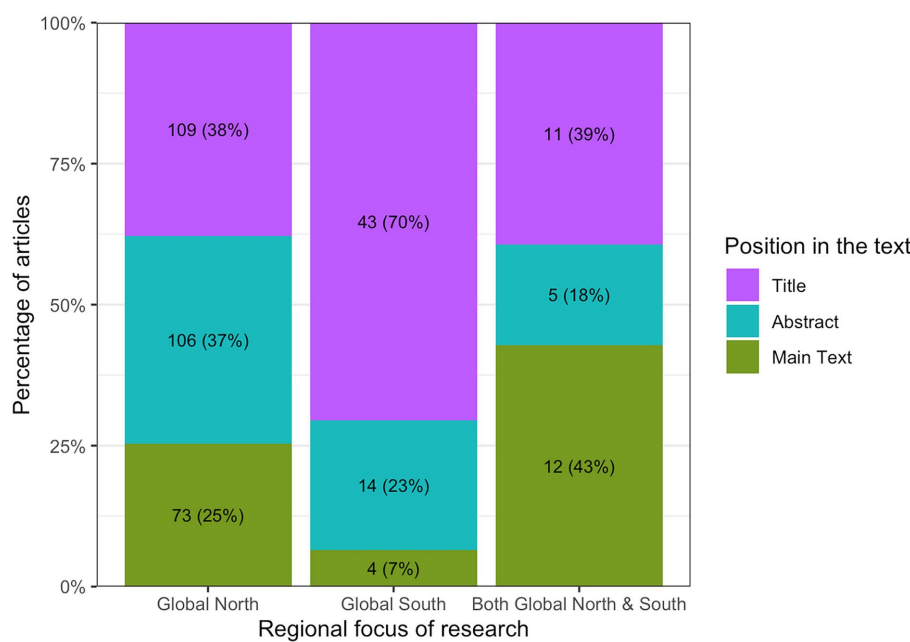


FIGURE 4
In-text geographic contextualization by articles' research focus. Articles coded as fiction work, online, reports/reviews, theoretical work, and NA were excluded.

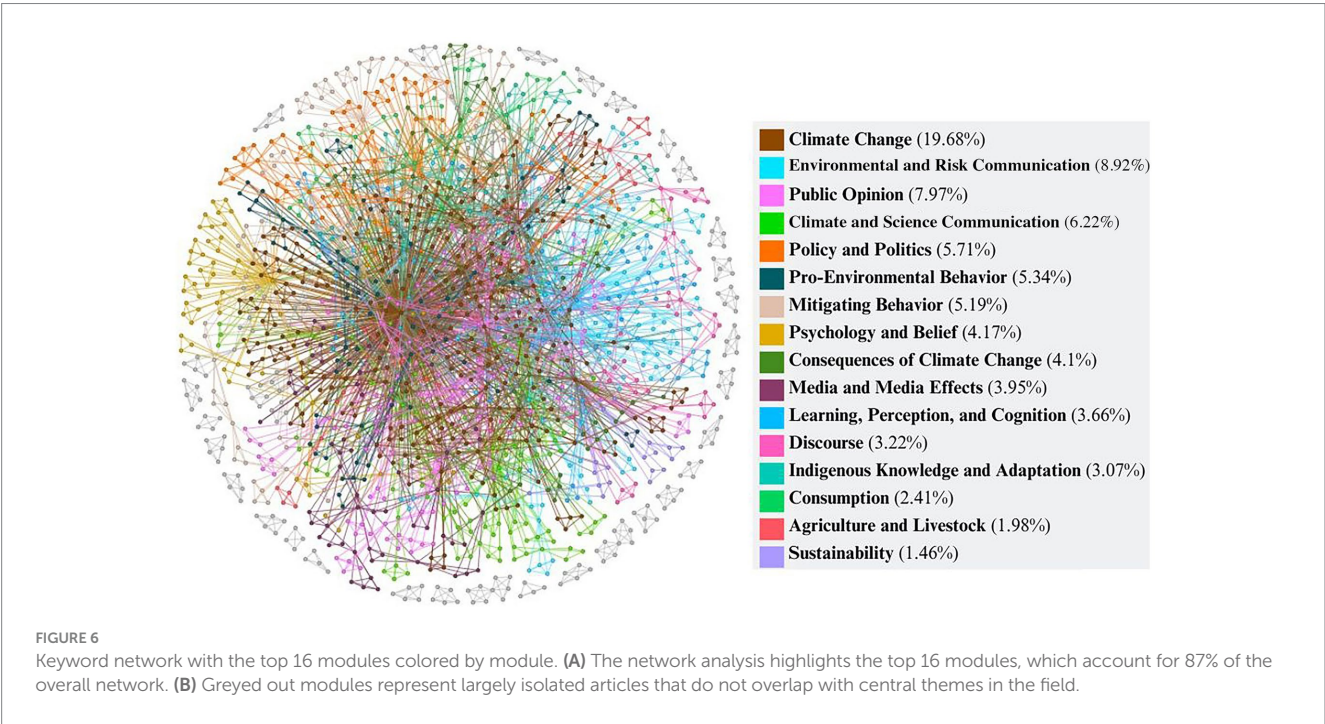
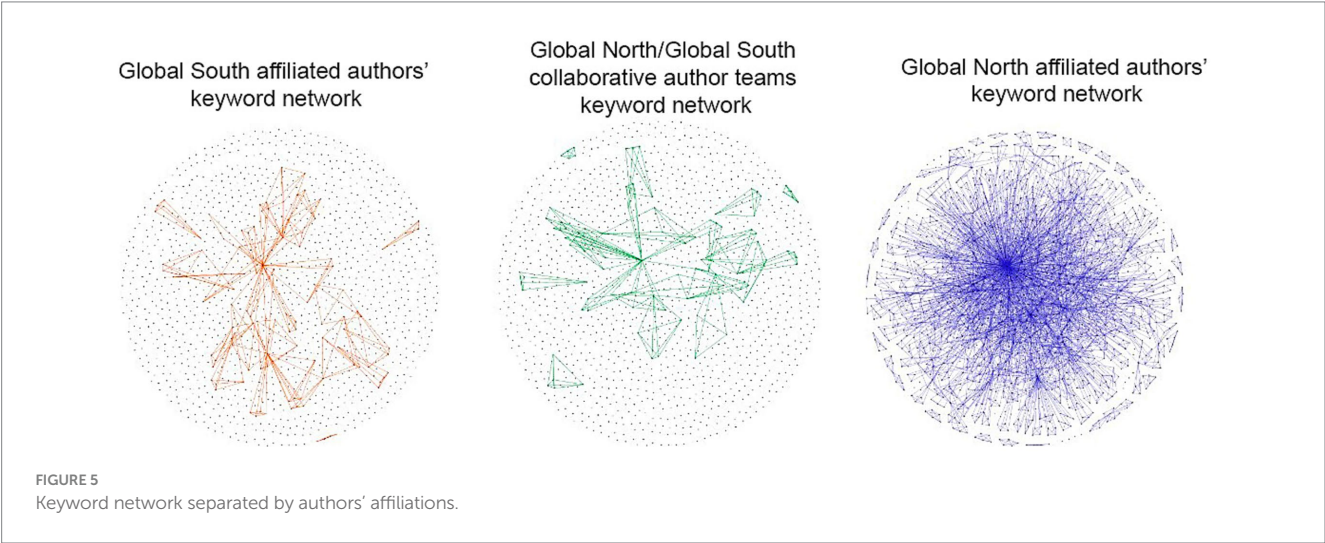
range of diverse subjects. This holds true amongst subsets of articles by GN/GS collaboration, with the average clustering coefficient higher amongst the smaller subsets, indicating their keyword neighborhoods are even more connected (GN only: 0.866 [0,1]; GN/GS collaboration: 0.955 [0,1]; GS only: 0.972 [0,1]). This is confirmed by average degree measures, which is higher for Global South-only authored papers and Global North/Global South collaborations (both 4.42) than for the overall network (3.2).

Turning next to the community structure of the network, we identify 49 modules, distinct groups of keywords that are more interconnected with each other than with other nodes in the network. The keyword network (both visualized in Figure 6 and described

textually in Table 4) exhibits the strong core-periphery structure with the largest 16 modules accounting for 87% of the network. This indicates that most of the key research topics are concentrated in a small number of central, interconnected clusters. The remaining 33 modules identified in the modularity analysis each fall below 1% of the total network size. In fact, 29 modules are made up of keywords of a single article and are functional isolates. None of the keywords used by these articles are used in any of the other articles in other modules, likely representing more niche or specialized topics in climate communication. Some articles are isolated within the network due to their specificity, such as the use of keywords referencing the name of a small nature reserve. These articles are visualized as peripheral grey

TABLE 3 Most-connected keyword nodes by degree between sub-networks.

Degree			
Overall network (<i>n</i> = 1,449)	Global north only (<i>n</i> = 1,244)	Global north/global south collaborations (<i>n</i> = 96)	Global south only (<i>n</i> = 109)
Climate change (446)	Climate change (569)	Climate change (28)	Climate change (34)
Framing (85)	Framing (94)	Disasters, vulnerability, polarization, climate change mitigation (all 8)	China (20)
Climate change communication (60)	Environmental communication (62)		Adaptation (16)
Environmental communication (55)	Climate change communication (61)		Norm activation theory (8)
Adaptation (54)	Adaptation (52)		



modules in Figure 6. Further examination reveals that several isolated articles are studying issues related to the Global South and non-dominant systems of knowledge, using keywords such as “Papua New Guinea,” “participatory knowledge production,” and “indigenous communities.” These keywords are rarely connected to the broader research themes in environmental and climate

TABLE 4 Top 16 modules in the keyword networks (topic title chosen based on the keywords contained in each module).

Module size in %	Topic	Top 3 keywords within module by highest degree
19.68	Climate Change	Climate change, adaptation, social media
8.92	Environmental and Risk Communication	Environmental communication, risk communication, social media
7.97	Public Opinion	Framing, public engagement, public perception
6.22	Climate and Science Communication	IPCC, communication, science communication
5.71	Policy and Politics	Climate policy, political polarization, survey
5.34	Pro-Environmental Behavior	Advocacy, climate adaptation, meat consumption
5.19	Mitigating Behavior	Climate change mitigation, pro-environmental behavior, transformation
4.17	Psychology and Belief	Climate change communication, motivated reasoning, political ideology
4.1	Consequences of Climate Change	Disasters, vulnerability, UNFCCC
3.95	Media and Media Effects	Media coverage, climate skepticism, climate change risk perceptions
3.66	Learning, Perception, and Cognition	Construal level theory, psychological distance, risk perceptions
3.22	Discourse	Twitter, discourse, values
3.07	Indigenous Knowledge and Adaptation	Climate change adaptation, interdisciplinary, indigenous people
2.41	Consumption	Public opinion, environmental policy, sustainable consumption
1.98	Agriculture and Livestock	Extreme event attribution, meat, livestock
1.46	Sustainability	Sustainability, sustainable development, resource consumption
87.05		

Topic title chosen based on the top 3 keywords.

communication. The visualization of the full keyword network can be viewed in [Supplementary Figure 1](#)

Conversely, one of the larger modules (Media and Media Effects in [Table 4](#)), the highest degree keywords include “media coverage” and “climate skepticism,” which indicates that media is well-connected to climate skepticism related keywords. Another module (Indigenous Knowledge and Adaptation in [Table 4](#)) is distinguished by topics related to indigenous communities, behaviors, and knowledge production. Articles within this module are focused on the lived experiences and adaptation strategies within these communities, rather than on the media discourse or policy discussions that dominate much of the broader field.

Modules were generated through the modularity measure, which cluster articles based on the degree of connectedness among keywords. Since keywords are author-selected and articles may focus on more than one topic (e.g., media effects and disaster), some overlap between modules is expected, as seen with terms related to “communication” or “behavior” in [Table 4](#). Topic titles for the modules were summarized by authors based on the highest degree keywords and represent approximations for the modules’ content.

5 Discussion

Discussions on diversity, equity, and inclusion are widespread in the field of communication and broader academia ([Chakravarty et al., 2018](#); [Freelon et al., 2023](#); [Lauf, 2005](#); [Trepte and Loths, 2020](#); [Wasserman, 2020](#)). Considering the field has been embroiled in these discussions for several years, we had expected to see the impact of these discussions in our findings. Overall, we did not find this to

be the case. Our findings suggest that the Global North is vastly overrepresented compared to the Global South across all sampled journals (*Environmental Communication*, *Climatic Change*, *Global Environmental Change*, *Science Communication*, and *WIREs Climate Change*).

5.1 Who is publishing environmental and climate communication studies?

Over 90% of the authors in this sample were affiliated with Global North based institutions. Although relying on institutional affiliation to understand geographic representativeness is limited, the authorship survey reveals that the majority of those who are affiliated in the Global North are also originally from the Global North. This imbalance of representation could stem from the fact that countries with more powerful economies have comparatively more resources to invest in science than economically weaker nations. For instance, in 2018, the U.S government spent the most on higher education research and development at roughly \$40 billion compared to other countries ([National Science Board, 2021](#)). Funding for scientists impacts scholarly output, and this is likely to be a contributing factor in the overrepresentation of Global North-affiliated authors in the sample. Focusing only on funding, however, would be reductive—and flawed. If funding were solely responsible, one could expect China, with its federal spending of \$24 billion on research and development, to be roughly half as present in our sample as the U.S. is. However, as our findings show, this is not the case. Authors affiliated with Chinese institutions comprise only 2% of the authorship, whereas those affiliated with U.S. institutions constitute 35%. Additionally, researchers from countries such as the

U.K., with smaller science budgets than China, are much more prevalent in the sample.

The authorship survey also revealed a pattern of geographic transitions that occurs for some authors from the Global South. Several respondents in the sample reported Global South countries as their place of origin and undergraduate education, while identifying Global North countries as their current place of affiliations. This transition has been termed as a “brain drain,” pointing to the challenges faced by the Global South in retaining scholars when better opportunities, pay, recognition, and resources often draw them in the Global North (Basilio, 2023). Scholars have found this relocation can lead to a redirection of their research priorities to Global North locations, often as a result of funding (Reidpath and Allotey, 2019).

According to the survey, we also see that nearly all (97%) of the respondents primarily publish in English, although it was listed as a native language for less than two thirds (62%) of respondents. While we only focused on English-speaking journals in the sample, the mismatch between respondents’ native language and their primary publishing language is surprising. This pattern suggests a trend of non-native English speakers to publish in English, given its status as the de facto language of global science. While some prominent journals of environmental and science communication also publish Spanish versions (see *Journal of Science Communication*), publications in other languages are often regarded as localized scholarly works with limited contributions to the global discourse (Gotti, 2020). These implications reinforce the hegemonic dominance of English-speaking countries as the center of knowledge production. As van Dijk (1994) asserts, non-English speakers face a “the triple disadvantage” in academia, having to read, write, and conduct research in another language (p. 276). Importantly, we do not fault authors who publish in English as opposed to their native language—which includes some of the co-authors of this study—as we recognize it is often required for international scholarly engagement and professional advancement (Gotti, 2020).

Turning to authorial positions, previous scholars have highlighted the tendency for authors from Global South institutions to appear in more junior authorial positions (Hedt-Gauthier et al., 2019; Miles et al., 2022). In our research, we see that the proportion of authors affiliated with institutions in the Global South remains largely constant across all five authorial positions. There are no significant increases of Global South-affiliated researchers in second, third, or later authorship positions, suggesting that, at least in this sample, Global South researchers are not disproportionately relegated to “lesser” authorship positions.

5.2 Where is the geographic focus of environmental and climate communication studies?

In terms of research focus, Global North countries dominate the sample, with the U.S. as the most studied nation. We also see that articles are likely to focus on the region in which the authors are based. Notably, a greater proportion of authors from the Global North wrote about the Global South than vice versa. Examining who is studying whom or which area is important considering conversations around decolonization in the fields of environmental and climate communication. Dutta and

Pal (2021) argue that knowledge production is often tied to colonialism, as those in power produce knowledge to justify and perpetuate their domination, expand their control and influence in the Global South. Central to this production is the erasure of knowledge in and from the Global South. Thus, exploring knowledge from and produced by the Global South can help disrupt the colonialist knowledge industry, and offer valuable alternative perspectives (Dutta and Pal, 2021).

The lack of diversity in authorial affiliation, combined with a tendency to study the authors’ current locations, may contribute to the lack of scholarly attention to the Global South. Consequently, the topics explored this scholarship may reinforce a focus on countries in the Global North, potentially neglecting issues important to the Global South. The gap in scholarship between Global North and Global South-focused research limits the ability of these disciplines to effectively understand and respond to the issues happening in other places around the globe. Takahashi et al. (2021, p. 6) posit that people in low- and middle- income countries might experience environmental issues differently compared to those in affluent, Western societies. Thaker (2021, p. 200) echoes this sentiment, arguing that there is an “urgent need to focus on environmental communication research in poor and developing countries, building and testing theories that are grounded in lived experiences of people in these countries.” Thaker notes that cross-cultural studies tend to use theoretical frameworks borrowed from the West, such as studying environmental issues in the Global South as a consequence of overpopulation, which is an outdated and unproductive perspective. Blicharska et al. (2017) also argue that the underrepresentation of the Global South in research may lead to these countries relying on Global North-based studies, the findings of which may not be transferable to their contexts. They point to the real-life consequences academic research focus can have: The abundance of Global North-focused climate research shapes the development of international climate change policy, thus affecting which issues receive attention and, crucially, funding. The priorities of the Global North can thus dominate the way these policies are structured to implicitly favor their countries, which “emit more carbon and are less vulnerable to climate change” (Blicharska et al., 2017, p. 23).

5.3 How and where do authors geographically contextualize their research?

Discrepancies in global research focus also extend to naming practices for studies researching the Global North or the Global South. A majority of articles (70%) about the Global South named their location within the title, while the same was true for only almost half that percentage (38%) of the articles about the Global North. This aligns with Castro Torres and Alburez-Gutierrez’ findings that Global North focused articles are less likely to geographically contextualize in the title. Furthermore, several articles did not explicitly locate their study at all, but were clearly confined to some sort of geographic place, using terms such as “Democrats,” “a Southwestern university,” “Fox News,” or “high school students.” These articles implicitly suggest the location as the U.S. and assume that it should be clear to a global audience from

just these markers, which is problematic. Readers all over the world are expected to be familiar with a U.S.-based TV channel. The same assumption is not made for non-U.S. contexts: In comparison, there is no article based in the Global South which does not specify its location explicitly in the text, indicating its status as “Other.” While these articles were in the minority, the lack of explicit location assumes the U.S. as the status quo not in need of further specification. The decision to specify a study’s location in the main text or abstract rather than the title is significant, considering that titles and abstracts are often the only parts that are accessible open-access. The mismatch in naming practices could also be due to the nature of peer-review, as reviewers may expect authors of Global South-based work to explicitly locate their study, and not expect the same of Global North-based research.

5.4 What is the thematic focus of environmental and climate communication studies?

Although only two of the five journals analyzed focused exclusively on climate change, *climate change* emerged as the central theme throughout the entire sample, aligning with [Comfort and Park’s \(2018\)](#) findings. This was true across various segments, including papers authored solely by researchers from the Global North, those from the Global South, and collaborative efforts between the two. The keyword network analysis suggests that research in Global South regions may center on additional, potentially more localized topics like disasters and vulnerability. The keyword *global warming* is prominent within the Global North authored papers, but not in Global South authored papers, perhaps pointing to an ongoing discussion on the nuances between the terms of climate change or global warming and the salience of climate skepticism in the Global North. The analysis also highlights the centrality of topics like *climate change*, *adaptation*, *framing*, and *social media*. The presence of isolated modules with keywords related to participatory knowledge, the Global South, and indigenous communities, indicates that these topics are niche interests in this sample of climate communication articles. This may point to a gap in the kinds of research focus between regions, where the Global North may prioritize policy and media driven topics over localized, community-based perspectives that the Global South may focus on. While we do not presume to prescribe research topics, scholars have long highlighted the necessity of exploring and publishing on understudied topics, such as Global South locations, participatory approaches, and non-Western knowledge systems, especially in the context of developing robust mitigation and adaptation strategies for climate change ([Kimmerer, 2013](#); [Thaker, 2021](#); [Takahashi et al., 2021](#)).

5.5 Recommendations

Our findings, like previous studies ([Castro Torres and Albreuz-Gutierrez, 2022](#); [Chakravarty et al., 2018](#); [Comfort and Park, 2018](#); [Keller et al., 2020](#); [Mahl and Guenther, 2023](#); [Walter et al., 2018](#)), point to a pattern of “othering” of non-Western research by establishing Western and White scholarship as the assumed “default” of knowledge

production. These Western-centric research insights, while valuable, may oversimplify the localized nature of climate change, mitigation, adaptation, and justice in the Global South, as research outcomes in the Global North may not be automatically transferable ([Takahashi et al., 2021](#); [Thaker, 2021](#)). Others have argued that certain methodologies may also be less suitable to studying the Global South, with some calling for the communication discipline to address these issues from a decolonial perspective to “undo, colonialist—white, capitalist, heteronormative, ableist—modes of scholarly inquiry and representation in disciplinary knowledge production” ([Pal, 2023](#), p. 1). The prioritization of certain geographic regions in environmental and climate communication limits our understanding and response to these issues, which may contribute to further climate injustices.

Drawing on the frameworks of crisis ([Cox, 2007](#)) and care ([Pezzullo, 2017](#)), we find it valuable to ground both environmental and communication in these frameworks. In this sense, communication across these disciplines has a “duty to prevent harm, but also a duty to honor the people, places, and nonhuman species with which we share our world” ([Pezzullo, 2017](#), p. 11). We recommend challenging and deconstructing the systems that limit the diversity of places, people, topics, ideas that are represented in this scholarship. Authors may increase and extend cross-regional collaborations and funding opportunities, publish in other languages, and read and cite in other languages when applicable. Journals, too, can contribute by setting explicit intentions to feature more diverse places, identities, languages, theories, research methodologies, and editorial boards. Examples of policy initiatives in journals include *Environmental Communication* recruiting regional editors from Africa, the Middle East, the Black diaspora, and Indigenous nations ([Pezzullo, 2024](#)). *Frontiers in Communication* has lower open access publishing fees and additional waiver options compared to other journals included in this sample, making it more affordable for scholars from the Global South, where research funding is often limited, to publish openly and access research. Special issues such as this one, *Enabling Diverse, Global Voices in Environmental Communication*, also provide a platform for including scholarship of authors and research based in non-Western contexts. The peer review process may also advocate for uniform geographic naming practices across all articles in titles, as to not marginalize Global South countries and to avoid presuming universality of findings from the Global North. By adopting these recommendations, scholars, journals, and academia can play an important role in advancing more equitable and diverse scholarship.

5.6 Limitations

The results of our study should be seen within the context of certain limitations. First, our selection of articles was based on [Moser’s \(2016\)](#) publication review of climate communication literature, which identified the top five producing journals of articles on this topic. These journals represent approximately 20% of all published research on climate communication, which spans across approximately 400 journals ([Moser, 2016](#)). While we acknowledge that our sample does not represent the entirety of environmental, nor, climate communication literature, it offers valuable insight into the articles from the primary journals contributing to these bodies of scholarship. Similarly, our selection

criteria encompassed both environmental and climate communication topics, not just limited to climate, extending beyond climate change to include issues such as resource consumption, natural disasters, biodiversity loss, wildlife, and pollution. As the articles were selected from journals that publish climate-focused scholarship, the dataset may potentially underrepresent environmental communication scholarship published in general environmental journals. However, three of the five journals selected (*Environmental Communication*, *Science Communication*, and *Global Environmental Change*), focus on environmental issues outside of climate change.

Additionally, given that our analysis focused solely on English-language journals, we also cannot draw conclusions about the scope of environmental and climate communication research published in other languages. Future publication reviews may address this by analyzing journals in other languages.

To understand research topics, we used author-provided keywords for the analysis. Keywords were developed by authors with unclear or inconsistent criteria across journals. Some articles lacked keywords altogether, while others provided three of the possible five. Our keyword analysis thus relies on decisions authors made without any insight into their selection process, and as such represent only an approximation of the paper's research focus.

Furthermore, the authorship survey responses may not be representative of the body of authors in the sample, let alone the broader field. However, they do provide important insight into the identities that are represented in this field, with trends indicating geographic shifts between nationality and affiliation for Global South authors that are consistent with other findings. Our results on authorship order may also be impacted by differing lab and discipline norms, varying from assigning position by credit, seniority, or alphabetical order (Frandsen and Nicolaisen, 2010).

Lastly, we recognize that the framing of Global North and Global South does not capture the socioeconomic and political intricacies of each country and has been criticized by some as a colonialist, outdated construct (Khan et al., 2022; Sabzalieva et al., 2020). In our coding procedure, the host institution listed on each publication determined Global North/South affiliation. This may obscure the identity of some researchers from the Global South who moved and are now affiliated with institutions in the Global North, as they were coded as Global North authors. We nonetheless consider this classification important to demonstrate the divides between research efforts, authors, and topics studied globally.

6 Conclusion

This study examined the global representation of environmental and climate communication literature across five journals: *Climatic Change*, *Environmental Communication*, *Global Environmental Change*, *Science Communication*, and *WIREs Climate Change*. Our findings show that, within the top-producing journals of this field, environmental and climate communication scholarship is far from representing the global nature of the climate crisis. Furthermore, we find disparities in how studies conducted

in the Global North and Global South are geographically contextualized. Turning to the content of the studies, climate change emerges as the most central overall and in each region, but articles from the Global North tend to study it through the lens of media and meta-discursive concepts, while articles from the Global South use keywords related to disasters, vulnerability, mitigation, and location.

In pursuit of a discipline that truly reflects global perspectives, it is important to critically examine the structures of power embedded within knowledge production, echoing the insights presented by Chakravarty et al. (2018). This publication review highlights the need for comprehensive and ethically grounded transformations in environmental and climate communication to foster inclusivity and genuine representation.

Data availability statement

The original contributions presented in the study are included in the article/[Supplementary material](#), further inquiries can be directed to the corresponding author.

Ethics statement

The studies involving humans were approved by Cornell University Institutional Review Board. The studies were conducted in accordance with the local legislation and institutional requirements. The participants provided their informed consent digitally to participate in this study.

Author contributions

SB: Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Project administration, Validation, Visualization, Writing – original draft, Writing – review & editing. AV: Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Project administration, Validation, Visualization, Writing – original draft, Writing – review & editing. RM: Data curation, Formal analysis, Investigation, Methodology, Project administration, Validation, Visualization, Writing – original draft, Writing – review & editing.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Supplementary material

The Supplementary material for this article can be found online at: <https://www.frontiersin.org/articles/10.3389/fcomm.2024.1474619/full#supplementary-material>

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