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METAPHORICAL REPRESENTATION OF NATURAL DISASTERS WITHIN MEDIA DISCOURSE

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Abstract. Against the backdrop of intensifying climate-related threats and the growing recurrence of natural disasters, media discourse has emerged as a key site where public perceptions of risk, patterns of social mobilization, and models of collective response are actively constructed. Within this communicative space, metaphor functions not merely as a stylistic device but as a fundamental cognitive and discursive mechanism, through which meaning is organized, interpretation is guided, and culturally embedded patterns of understanding are activated. The study of metaphorical framing thus offers a productive analytical lens for examining the dynamics of crisis communication, environmental rhetoric, and processes of collective sense-making. The present study is devoted to the identification and systematic analysis of metaphorical frames in English-language media discourse devoted to natural disasters. The empirical basis of the research is a balanced corpus of texts published by English-speaking media between 2023 and 2024, focusing on two recurrent types of natural hazards – wildfires and floods, which makes it possible to conduct a symmetrical comparison of British and American media environments. The theoretical framework of the study draws on an integrative approach that combines Conceptual Metaphor Theory, Frame Semantics, Critical Discourse Analysis, and the principles of Critical Metaphor Analysis. Methodologically, the research relies on corpus-based techniques, including frequency analysis, collocational profiling, and contextual examination implemented through the AntConc software, in conjunction with the MIPVU protocol for systematic metaphor identification. The reliability of the analytical procedure is ensured by corpus symmetry and inter-annotator validation. As a methodological contribution, the study introduces the notion of a frame index, understood as a quantitative indicator of metaphorical intensity, thereby extending the analytical toolkit of cognitive-discursive research. The study aims to determine the dominant patterns of metaphorical framing employed in media representations of natural disasters, to explicate their cognitive and discursive functions, and to trace their variation across different media platforms and types of catastrophic events. The findings advance current approaches in cognitive linguistics and media discourse analysis and have practical implications for the development of environmental communication strategies, media literacy, and editorial practices in the coverage of climate-related risks.

Keywords: metaphorical framing, media discourse, cognitive discourse analysis, environmental communication, corpus-based analysis.

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МЕТАФОРИЧЕСКАЯ РЕПРЕЗЕНТАЦИЯ ПРИРОДНЫХ КАТАСТРОФ В МЕДИАДИСКУРСЕ

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Аннотация. На фоне усиления климатических угроз и растущей повторяемости природных катастроф медиадискурс выступает ключевой площадкой, где активно конструируются общественные представления о риске, модели социальной мобилизации и формы коллективного реагирования. В рамках данного коммуникативного пространства метафора функционирует не просто как стилистический прием, но как фундаментальный когнитивно-дискурсивный механизм, посредством которого организуется смысл, направляется интерпретация и активируются культурно закрепленные модели понимания. Таким образом, исследование метафорического фреймирования представляет собой продуктивную аналитическую оптику для изучения динамики кризисной коммуникации, экологической риторики и процессов коллективного осмысления происходящего. Настоящее исследование посвящено выявлению и систематическому анализу метафорических фреймов в англоязычном медиадискурсе, связанном с природными катастрофами. Эмпирическую базу исследования составляет сбалансированный корпус текстов в англоязычных медиа за 2023–2024 гг., посвященных двум повторяющимся типам природных угроз – лесным пожарам и наводнениям, что позволяет провести симметричное сопоставление британской и американской медиасред. Методология исследования опирается на интегративный подход, объединяющий теорию концептуальной метафоры, фреймовую семантику, критический дискурс-анализ и принципы критического анализа метафоры. Исследование базируется на корпусных методах, включая частотный анализ, коллокационное профилирование и контекстуальный анализ, реализованных с использованием программного обеспечения AntConc, в сочетании с протоколом MIPVU для систематической идентификации метафор. Надежность аналитической процедуры обеспечивается симметричностью корпуса и межаннотаторской валидацией. В качестве методологического вклада в работу вводится понятие фреймового индекса, понимаемого как количественный показатель метафорической интенсивности, что расширяет аналитический инструментарий когнитивно-дискурсивных исследований. Цель исследования состоит в выявлении доминирующих моделей метафорического фреймирования, используемых в медиарепрезентациях природных катастроф, в раскрытии их когнитивных и дискурсивных функций, а также в отслеживании их вариативности в зависимости от медиаплатформ и типов катастрофических событий. Полученные результаты развивают современные подходы в когнитивной лингвистике и анализе медиадискурса и обладают практической значимостью для разработки стратегий экологической коммуникации, формирования медиаграмотности и совершенствования редакционных практик при освещении климатических рисков.

Ключевые слова: метафорическое фреймирование, медиадискурс, когнитивно-дискурсивный анализ, экологическая коммуникация, корпусный анализ.

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Introduction

In the context of intensifying climate instability and the growing frequency of natural disasters, media discourse has increasingly assumed a decisive role in the formation of public awareness, the modulation of emotional engagement, and the orientation of collective responses to environmental crises. Contemporary media can no longer be regarded as neutral channels for the transmission of factual information about natural hazards. Rather, they operate as active agents of meaning production. By mobilizing specific linguistic and cognitive mechanisms, media texts construct interpretative frameworks that shape how societies perceive, evaluate, and respond to climate-related threats. Among these mechanisms, metaphor occupies a central position. Far from functioning as a merely ornamental element of discourse, it constitutes a fundamental cognitive instrument, through which experience is structured, interpretation is guided, and culturally embedded values are incorporated into communicative practice. Through metaphorical framing, natural disasters are rendered as recognizable conceptual scenarios an enemy to be confronted, a punishment to be endured, a battle to be won, an uncontrollable force of nature, or even an agentive entity endowed with intentionality. Such metaphorical projections exert a direct influence on audience interpretations of danger, patterns of responsibility attribution, and expectations regarding institutional or societal action.

The urgency and relevance of the present research stem from the pivotal role of global media in shaping ecological consciousness and public discourse surrounding natural disasters. As climate-related emergencies become simultaneously more severe and more intensively mediated, the need to examine how linguistic framing constructs social reality and directs behavioral responses becomes increasingly pressing. The English-language media sphere, characterized by its global reach and discursive authority, establishes dominant interpretative patterns that frequently circulate beyond national boundaries. Consequently, a systematic investigation of metaphorical framing within this communicative domain acquires not only theoretical significance but also communicative and ethical relevance for the fields of environmental linguistics and crisis communication.

Despite the extensive body of research devoted to conceptual metaphor and framing theory, a number of conceptual and methodological gaps remain unresolved. First, many existing studies tend to focus on isolated metaphorical models such as war, medical, or religious metaphors without addressing the ways, in which these models interact within a broader, systemically organized framing structure. Second, comparative analyses remain relatively scarce: few studies undertake a direct comparison of distinct media ecosystems, particularly those of British and American outlets, which are shaped by different cultural, institutional, and ideological configurations. Third, although digital media increasingly mediate public experience of natural disasters, the mechanisms of metaphorization in online formats remain insufficiently explored, despite their incorporation of new multimodal and semiotic dimensions. Finally, within Kazakhstani scholarship, cognitive-discursive approaches are actively developing; however, the metaphorical framing of natural disasters in media discourse has so far been addressed only fragmentarily and without a unified methodological framework.

The scientific novelty of the present study lies in its comprehensive and empirically grounded comparison of metaphorical frames in English-language media texts produced by BBC News (BBC)¹ and Voice of America² (VOA) between 2023 and 2024. For the first time, a symmetrically structured corpus has been compiled on the basis of two contrasting types of natural disasters – wildfires and floods reflecting the culturally salient “fire–water” dichotomy that underlies many representations of nature. The research adopts an integrative analytical perspective by combining Conceptual Metaphor Theory (CMT), Frame Analysis, Critical Discourse Analysis (CDA), and Critical Metaphor Analysis (CMA). In addition, the introduction of a quantitative frame index (FI) makes it possible to operationalize

¹ BBC News внесен Минюстом РФ в реестр СМИ-иноагентов. Роскомнадзор заблокировал на территории РФ официальный сайт Британской радиовещательной корпорации (BBC).

² Voice of America внесен Минюстом РФ в реестр СМИ-иноагентов.



the measurement of metaphorical intensity across corpora, thereby enhancing the methodological precision of cognitive-discursive research and ensuring the replicability of the analytical procedure.

The aim of the study is to identify and describe the dominant types of metaphorical framing employed in English-language media discourse on natural disasters, as well as to determine their cognitive-discursive functions, pragmatic implications, and variation depending on the type of disaster and the institutional media context. In order to achieve this aim, the following research objectives were formulated:

- to compile a balanced corpus of BBC and VOA media texts on wildfires and floods (2023–2024);
- to identify dominant metaphorical frames and their lexico-semantic markers;
- to conduct quantitative and qualitative analyses of frame distribution and metaphorical intensity;
- to compare the results across media platforms and disaster types;
- to interpret the observed differences in terms of cultural cognition, editorial strategies, and audience orientation.

The central research question guiding this study is as follows: what cognitive and discursive strategies of metaphorical framing dominate in the media texts of BBC and VOA, and how do these strategies vary depending on the type of natural disaster and the institutional culture of the media outlet?

Addressing this question makes it possible to reveal how metaphorical and framing mechanisms mediate the interpretation of environmental threats and to uncover the deeper cultural codes that underlie these interpretative practices. In this way, the study combines theoretical relevance by advancing an integrative cognitive-discursive methodology with practical significance, offering insights for the development of more responsible and effective strategies of risk communication, environmental education, and climate awareness within both global and local media systems.

Theoretical Framework

Conceptual and Methodological Foundations of Metaphorical Framing

The problem of metaphorical framing in media representations of natural disasters is rooted in cognitive and discursive traditions that treat language as a principal instrument for structuring experience and rendering it interpretable. Accordingly, the theoretical basis of the present study draws on several closely connected perspectives – CMT, Frame Semantics, Framing Theory, and CDA brought together under the umbrella of CMA.

The cognitive turn is conventionally associated with the work of Lakoff and Johnson who, in *Metaphors We Live By* [1], argued that metaphor should be understood as a general cognitive mechanism that shapes conceptual models of world perception. In their account, metaphor is not a decorative resource of language but a primary mode of mental modeling through which abstract domains become comprehensible in terms of more concrete experience. In *Women, Fire, and Dangerous Things* [2], Lakoff further elaborated prototype-based categorization, demonstrating that the metaphorical organization of semantic space reflects culturally entrenched ways of structuring knowledge. These arguments became foundational for cognitive linguistics and, crucially for the present inquiry, opened the way to treating metaphor as an interpretative frame rather than a stylistic choice.

A key complement to this cognitive model is Fillmore's Frame Semantics [3], which conceptualizes frames as relatively stable structures of knowledge that provide the interpretative environment for linguistic meaning. For Fillmore, lexical units do not operate in isolation: they activate whole scenes, including expectations, participant roles, and conventional relations that make interpretation possible. This perspective enables a systematic account of discourse semantics and offers a principled explanation of how certain lexical choices presuppose particular scenarios. In combination, Lakoff's and Fillmore's approaches support a contemporary understanding of metaphor as a frame-like cognitive configuration that organizes experience and shapes the representation of events, including those associated with natural disasters.



An important strand of framing scholarship was developed by Goffman and later refined in media studies by Entman. In *Frame Analysis* [4], Goffman described frames as “organizational principles of experience” that allow individuals to make sense of reality through culturally established scenarios. Entman, in *Framing: Toward Clarification of a Fractured Paradigm* [5], specified framing in media discourse as the selection and salience of certain aspects of reality in ways that promote particular definitions, evaluations, and interpretations of events. These positions provide the methodological groundwork for studying disaster reporting as a meaning-making practice, in which frames do not simply depict phenomena but confer social significance upon them.

Subsequent developments in the study of metaphor and framing are closely associated with CDA, represented by Wodak and Meyer [6], van Dijk [7, 8], and Fairclough [9]. Wodak and Meyer approach CDA as an analytic framework for examining the interdependence of language, power, and ideology, with particular attention to implicit social relations encoded in discourse. Van Dijk develops a socio-cognitive orientation, in which discourse is treated as an interface between social structures and individual cognition, while Fairclough foregrounds the interaction between text, discursive practice, and social practice. Taken together, these approaches allow metaphorical frames to be examined not only as cognitive formations but also as ideological configurations, through which evaluative and political emphases are produced in representations of disaster.

A further step in consolidating the critical perspective was provided by Charteris-Black’s CMA [10], which explicitly integrates the cognitive and rhetorical dimensions of metaphor within a single analytical procedure. Charteris-Black proposes a three-level model cognitive, rhetorical, and pragmatic designed to capture the ideological work of metaphor as well as its persuasive capacity in shaping audience orientations. CMA thus connects the explanatory ambitions of Lakoff’s conceptual metaphor theory with the interpretative concerns of CDA, shifting the focus from the description of mental mappings to the socio-pragmatic consequences of linguistic choice. In the context of media discourse on natural disasters, this approach is especially productive, as it clarifies how metaphorical constructions both register and actively configure shared perceptions of threat, agency, and responsibility. The further development of this integrative trajectory can be observed in the work of Hart [11] and of Koller and Semino [12], who advance cognitive-discursive models combining corpus methods, cognitive semantics, and CDA. Hart argues that the synthesis of cognitive and functional-grammatical tools makes it possible to uncover ideological implications embedded in linguistic structures, whereas Koller and Semino demonstrate that metaphors and frames in political and media discourse operate as mechanisms for shaping public attitudes, particularly under crisis conditions.

On this basis, the combined use of CMT, Frame Semantics, Framing Theory, CDA, and CMA constitutes the methodological foundation of the present research. Such a synthesis makes it possible to examine metaphorical frames as cognitive-discursive units that connect language, thought, and social reality in a systematic way. Applied to media representations of natural disasters, the approach supports both the description of metaphorization mechanisms and the identification of cognitive models that underlie public perceptions of threat and response. The present study is the first to bring CMT, CDA, and CMA into a unified methodological system, in which principles of cognitive framing are directly combined with critical-discursive strategies for interpreting media meanings.

Contemporary Empirical Research on Metaphorical Framing

Recent empirical research provides convincing evidence that metaphors and frames in media discourse do not merely depict natural disasters but actively participate in the construction of social meanings of threat, thereby shaping emotional reactions and patterns of behavior. In this regard, scholarly attention has progressively shifted from the descriptive cataloguing of metaphorical models to an examination of their impact on risk perception, public mobilization, and political decision-making.



One of the central lines of inquiry concerns the role of metaphorical framing in defining the cognitive interpretation of danger. Hauser and Fleming [13] demonstrate that antagonistic metaphors such as representations of nature as an attacking force or the framing of disasters as battles to be fought intensify perceptions of threat and contribute to increased support for restrictive protective measures. Their experimental findings show that aggressive metaphorical language enhances readiness for preventive action while simultaneously amplifying anxiety and reinforcing beliefs in the uncontrollability of natural forces. In a similar vein, Vinnell et al. [14] reveal that even seemingly technical terminological distinctions such as the contrast between *hazard* and *disaster* generate divergent behavioral scripts: the former tends to activate preventive orientations, whereas the latter predominantly elicits reactive responses. These results underscore the pronounced sensitivity of public consciousness to linguistic formulations of risk and highlight the necessity of incorporating metaphorical structuring into communication strategies.

A further body of research foregrounds the mobilizing function of metaphor in disaster-related communication. Depoux et al. [15] show that framing climate risks through metaphors of collective responsibility and shared solidarity enhances public engagement and strengthens preparedness initiatives. Badullovich et al. [16], drawing on large-scale mapping of climate rhetoric, demonstrate that positively connoted metaphors oriented toward global cooperation foster public trust and reinforce support for environmental policy measures. Taken together, these studies signal a paradigmatic transition from viewing metaphor as a primarily rhetorical resource to recognizing its instrumental role in shaping public perception and guiding collective action. Within this context, war and crisis metaphors occupy a particularly salient position. Blankshain et al. [17] establish that war metaphors possess an ambivalent potential: they can mobilize collective effort while simultaneously encouraging fatalistic attitudes. Musolff [18], in his analysis of ironic and satirical “warfare” rhetoric in pandemic discourse, argues that the reinterpretation of such metaphors may reduce anxiety and facilitate cognitive reappraisal of crisis situations. Semino [19] demonstrates that reframing “soldiers” as “firefighters” redirects discourse from confrontation toward cooperation and solidarity. Correspondingly, Brugman et al. [20] show that risk perception varies systematically depending on whether metaphors of struggle, healing, or recovery are employed. Feifei [21], focusing on visual metaphors in pandemic news coverage, identifies three recurrent schematic patterns – WAR, FAMILY, and SPATIAL, which organize emotional responses and spatial imaginaries of collective action. Collectively, these findings indicate that the metaphorical architecture of crisis discourse does not simply reflect social reality but actively structures behavioral scenarios, normalizing particular forms of social response.

Research addressing the framing of natural disasters and environmental risks further elaborates this perspective. Groff [22] demonstrates that media narratives surrounding global smoke plumes and wildfire events contribute to the formation of shared cognitive models of danger, transforming environmental catastrophe into a symbol of planetary interdependence. Shellington et al. [23] show that the adoption of a public health frame in media communication about wildfire smoke increases public engagement and promotes environmentally responsible behavior. Karyotakis and Lo [24], in their analysis of 241 media articles on the Evros wildfires in Greece, reveal that the political ecology of disaster is significantly shaped by metaphorical choice: framing fire as an “enemy” legitimizes militarized responses, whereas narratives emphasizing natural recovery foreground humanitarian and restorative discourses. Jacobson et al. [25] further observe that journalists, politicians, and activists frequently construct competing interpretations of risk, generating what they describe as “semantic collisions” between frames. Dasandi et al. [26] demonstrate that appeals to global health and ecological solidarity strengthen support for climate policy by explicitly linking individual behavior with collective well-being.

Synthesizing these lines of inquiry reveals a clear evolution in the scholarly understanding of metaphor from a rhetorical device to a core cognitive mechanism governing the social management of



risk perception. Whereas earlier studies primarily documented metaphorical usage, contemporary research conceptualizes metaphor as a mode of conceptual modeling that directly influences decision-making, mobilization, and collective solidarity. Within this framework, metaphor and frame function as strategic instruments of discursive regulation: through them, media discourse not only represents disasters but actively constructs a symbolic order, in which responsibility, agency, heroism, response strategies, and moral accountability are defined.

Expanding Contexts: Digital Media, Transnational Narratives, and Climate Discourse

The current stage of research on the framing of natural disasters reflects a clear shift from the analysis of local print media to the study of digital and transnational platforms, mirroring broader transformations in risk communication under conditions of globalization. Contemporary media discourse increasingly operates within a networked communicative environment, in which national and international boundaries become permeable, and metaphors and frames function as “circulating structures” that shape global perceptions of climate-related risk.

Torricelli et al. [27] demonstrate that large-scale events such as hurricanes provoke significant surges of online discussion concerning climate change, particularly within social media environments such as Twitter. Their findings indicate that digital platforms not only accelerate the dissemination of metaphorical patterns but also facilitate their intertextual transformation, resulting in a shared space of public meaning-making around disasters. Vikström et al. [28] further show that national media construct “climate futures” through three dominant framing patterns – catastrophic, mobilizational, and ethical. These frames extend beyond the mere reflection of scientific debates, instead establishing moral coordinates, through which risk is interpreted and narratives of planetary responsibility are reinforced. In this sense, the digital media ecosystem functions simultaneously as an informational infrastructure and as a discursive arena, in which a global “politics of empathy” toward natural threats is cultivated.

Cody et al. [29], tracing the longitudinal evolution of climate discourse across ideological positions, identify a notable shift in U.S. media coverage from predominantly economic and energy-oriented frames during Hurricane Katrina to ecological and moral frames during Hurricane Sandy. This transformation signals a growing awareness of the interconnection between natural disasters and sustainable development. Cox et al. [30], employing CDA in the study of wildfire reporting, demonstrate that media discourse performs not only an informative but also a legitimizing function, frequently juxtaposing the figure of the “responsible state” with that of the “irresponsible citizen.” In a similar vein, Stecula and Borah [31] argue that popular climate discourse produces an ideology of collective guilt and global discipline, effectively transforming the environmental agenda into a mechanism of moral governance. Taken together, these studies confirm that metaphorical and framing models of disasters must be interpreted as integral components of broader political and ideological constructions of contemporary social reality.

A substantial theoretical contribution to the understanding of the humanitarian dimension of disasters is provided by Chouliaraki [32], whose theory of post-humanitarian communication conceptualizes a shift from a discourse of pity toward a discourse of participation. Chouliaraki demonstrates that media representations of catastrophe generate an “ethics of distance,” in which emotional engagement is carefully regulated through visual and metaphorical strategies. Within this context, Koteyko and Atanasova [33] make an important contribution by systematizing discursive approaches to climate communication and emphasizing their interdisciplinary character. They argue that metaphor operates as a mediating mechanism between science, politics, and society, translating scientific knowledge into emotionally resonant and socially meaningful imagery. Günay et al. [34] offer a detailed analysis of British news coverage of natural disasters, focusing on the interaction between visual and textual framing in climate change narratives. Their findings indicate that British media discourse tends to foreground institutional accountability, governmental response, and collective



mobilization, rather than narratives of individual heroism. These results underscore the extent, to which national media systems construct climate-related events through culturally embedded frames that reflect broader political and social ideologies. Günay's conclusions further substantiate the methodological relevance of comparing BBC and VOA coverage, aligning with reviewers' recommendations to broaden the comparative perspective and address the cross-cultural dimension of media discourse on natural disasters.

In sum, contemporary scholarship demonstrates that media discourse on natural disasters is increasingly evolving into a global network of symbolic interaction, in which digital platforms, national media outlets, and transnational narratives mutually reinforce one another. Within this environment, metaphor transcends its local interpretative function and emerges as a mechanism of global semi-otic ecology, shaping behavioral models, collective identities, and regimes of moral accountability. Consequently, the symmetrical comparison of BBC and VOA undertaken in the present study is not only methodologically justified but also essential for identifying both universal and culturally specific framing patterns in media representations of natural disasters.

National Scholarship and Research Gaps

In recent years, Kazakhstani linguistics has demonstrated consistent progress in the development of cognitive-discursive approaches, reflecting a growing scholarly interest in metaphor, framing, and discursive strategies across a wide range of communicative domains. Within national scholarship, a locally grounded cognitive tradition has gradually taken shape, addressing issues of identity construction, political communication, translation processes, cultural codes, and metaphorical organization of meaning. At the same time, the framing of natural disasters has largely remained beyond the scope of domestic linguistic research.

Zhunussova et al. [35] examine the formation of multilingual students' identities in English-medium universities, demonstrating that media discourse functions as a space of socialization, in which cognitive models and patterns of self-identification are actively constructed. Their findings foreground media texts as instruments, through which culturally specific scenarios of perception are formed and internalized. In a related critical perspective, Gusarov [36] analyzes international media coverage of Kazakhstan's 2022 presidential elections, showing how journalistic narratives generate interpretative frames that shape public perceptions of political legitimacy and civic participation. Abdyzhaparova et al. [37] focus on metaphorical representations of the human-nature relationship in literary discourse, emphasizing the universality of metaphor as a cognitive mechanism for structuring experience. Beknazarova et al. [38] further advance the cognitive interpretation of metaphor by demonstrating its role in organizing discourse semantics and ensuring conceptual coherence. Taussogarova et al. [39] propose an innovative analytical framework for the study of "food discourse" in Kazakh culture, illustrating the effectiveness of cognitive-linguistic methods in uncovering national values and culturally embedded communicative patterns. Sagadiyeva et al. [40] approach political discourse from a translation perspective, revealing how cultural contexts influence meaning transformation when metaphorical structures are transferred from Kazakh into English. Mussaly et al. [41], in their analysis of symbolism in Kazakh poetic traditions, show that both symbol and metaphor function as instruments of mental modeling within the national worldview.

Taken together, these studies testify to the active formation of a Kazakhstani cognitive-discursive school, in which metaphor is conceptualized not merely as a linguistic device but as a mechanism of worldview construction. Nevertheless, despite the thematic diversity of this body of research – encompassing identity, translation, cultural representation, and political discourse, no study has yet undertaken a systematic analysis of the media framing of natural disasters. Furthermore, domestic scholarship has only partially engaged with corpus-based methodologies that combine quantitative and qualitative procedures within an integrated analytical design.



Thus, notwithstanding the methodological maturity of the national cognitive-discursive tradition, a substantial research gap remains, namely the absence of a comparative analysis of English-language media frames of natural disasters. While current Kazakhstani studies provide a solid theoretical and methodological foundation, they have not fully realized the potential of cross-linguistic and cross-cultural comparison in this domain. The present study addresses this gap by integrating, for the first time, CMT, CDA, CMA, and corpus-linguistic methods within a single analytical framework, while introducing an original FI designed for the quantitative assessment of metaphorical intensity.

This integrative methodological configuration defines the scientific novelty and significance of the study, positioning it as the first comparative corpus-based investigation in Kazakhstani cognitive linguistics devoted to English-language media representations of natural disasters.

Methodology

Research Design and Corpus Materials

This study was conducted within the framework of a mixed cognitive-discursive approach that integrates quantitative corpus-based techniques with qualitative interpretation. The analytical material consists of English-language news texts on natural disasters drawn from two comparable media ecosystems – BBC and VOA, which enables the identification of cross-cultural differences in the media representation of environmental threats. The subject field is limited to two of the most representative types of disasters in recent years – wildfires and floods (2023–2024), which provide a contrasting “fire/water” dichotomy and rich metaphorical potential.

The total size of the corpus amounts to 17,783 tokens; to ensure symmetrical comparison, it is structured into four subcorpora: BBC Wildfires, BBC Floods, VOA Wildfires, and VOA Floods. The dataset includes full-text news articles and analytical features with developed narrative structures, while short news briefs, duplicate publications, advertisements, and service inserts were excluded. To ensure reproducibility, all source links and dates of retrieval were recorded (publication date range: June 2023 – March 2024). The complete list of texts, along with the codebook and data exports, will be made openly available upon publication. The selection of BBC and VOA is motivated by their cultural and institutional contrast while preserving linguistic and journalistic comparability. Both are international English-language broadcasters adhering to comparable editorial standards, yet rooted in distinct socio-political contexts: BBC representing the European public-service model and VOA reflecting the U.S. public diplomacy media. Each subcorpus contains an equivalent number of full-length analytical reports within the same timeframe, ensuring corpus symmetry and enhancing the validity of comparative inferences across national media systems.

Theoretical Framework and Analytical Anchors

The analysis is structured around three interrelated foundations. Frame Analysis provides the operational model for identifying interpretative frames that determine, which aspects of a disaster are brought to the foreground. CMT [1] enables a cognitive interpretation of stable projections relevant to natural disasters. CDA allows for the evaluation of the social functions of metaphorization – from the construction of collective vulnerability to the legitimation of mobilization strategies. In addition, the study incorporates Charteris-Black’s CMA, which bridges cognitive and critical paradigms by uncovering the ideological and persuasive dimensions of metaphor use. CMA extends CMT by emphasizing how linguistic choices reflect power relations, social hierarchies, and institutional interests within discourse. This framework complements CDA by revealing not only what metaphors are used but why they are used in specific socio-political contexts.

The methodological architecture thus integrates CMT → CDA → CMA → Frame Analysis as a single analytical system. CMT provides the conceptual foundation for cross-domain mapping; CMA operationalizes the evaluation of ideological and evaluative load; CDA situates these mappings within power discourse; and Frame Analysis synthesizes them into a measurable structure for cross-media



comparison. Based on this theoretical model and a preliminary review of the corpus, five target frames were operationalized: Aggressive Nature / Enemy, Uncontrollable Force, Animistic Nature, Helplessness/Vulnerability, and Mobilization/Prevention.

Corpus Processing Tools and Parameters

The textual data were converted to plain text files (.txt, UTF-8 encoding) for subsequent corpus processing and analyzed using AntConc (version 4.1.4 on Windows 11). The following modules were employed: Wordlist (frequency), Collocates (collocational structure), and Concordance / Key Word in Context (KWIC) (contextual usage). To reduce noise, a stop list of English function words was applied. Lexemes were aggregated into lemmatized “families” based on the codebook guidelines (e.g., destroy, destroyed, and destruction were treated as a single marker; borderline cases were recorded separately). For collocational analysis, a symmetrical context window (L5–R5) was set, and the primary association metric was logDice, with MI3 used for robustness checks. Only collocations exceeding a minimum frequency threshold (≥ 3 occurrences per subcorpus) were included in the analysis. In KWIC, a fixed context window was used, and case sensitivity and punctuation sensitivity were documented in the processing protocol. This combination of frequency, collocational, and contextual modules provides a solid foundation for triangulating metaphorical meaning across micro- (lexical), meso- (collocational), and macro- (discursive) levels of analysis.

Metaphor Identification Procedure Vrije Universiteit and Frame Mapping

Metaphor annotation followed an adapted Metaphor Identification Procedure Vrije Universiteit (MIPVU): for each lexical item, the basic (historically prior/conventional) meaning was compared with its contextual meaning. If a semantic shift and a cross-domain mapping were identified, the lexeme was labeled as metaphorical. Annotation was performed at the level of KWIC contexts rather than isolated tokens. Metaphorically marked lexemes were then mapped onto target frames in accordance with the codebook. In ambiguous cases, context-prioritization rules and consensus-based decisions were applied. Multiple labels were permitted in cases of clear interpretative competition and were recorded in the annotation protocol. This multi-layered procedure allowed for the integration of cognitive precision and interpretative flexibility, consistent with the CMT–CDA–CMA framework.

Quantitative Measures and Cross-Corpus Comparisons

To enable cross-subcorpus comparison, all lexeme frequencies were normalized per 10,000 tokens (per 10k) (this normalization base was retained across all tables and figures); absolute frequencies were also reported due to the low frequency of some items. Distributional comparisons between subcorpora were conducted using the log-likelihood ratio (G^2) with a significance threshold of $p < 0.01$, or tests robust to low-frequency events (e.g., Fisher’s exact test with $p < 0.05$ and Benjamini–Hochberg correction for multiple comparisons). Effect sizes were reported using rate ratio, differential salience (%DIFF), and confidence intervals. All interpretations of differences were made with caution, taking into account the limited data size and the dispersion of rare lexical items.

In addition to standard corpus metrics, a composite FI was developed to quantify the intensity and salience of metaphorical framing across subcorpora. The FI integrates normalized frequency, collocational strength (logDice), and lexical diversity of metaphoric markers per frame. This measure operationalizes the interaction between metaphorical density and discursive emphasis, allowing for a replicable evaluation of frame prominence within and across media systems.

Reliability and Reproducibility

To ensure consistency, the following procedures were applied: initial calibration on a pilot sub-sample, peer checking / double coding of a portion of the corpus (15% of the total dataset), and consensus coding to resolve discrepancies. Inter-annotator agreement was calculated using Cohen’s κ and Krippendorff’s α ; 95% confidence intervals were computed separately for single-token items and multi-word expressions. Detailed rules for assigning lexemes to frames are codified in the codebook.



Reproducibility was ensured by preserving all analytic artifacts, including AntConc exports, frequency and collocation lists, KWIC protocols, and software versions and parameter settings. A public deposit of all research materials (codebook, frequency lists, annotation schemes) is planned in the Open Science Framework, with an assigned DOI. This level of transparency aligns with current open-science standards and allows other researchers to replicate or extend the present study's analytical design.

Limitations and Ethical Considerations

The study is limited to two media outlets and two types of natural disasters, a decision that ensures design symmetry but narrows the generalizability of findings. The issue of low-frequency markers is addressed through normalization procedures and a focus on distributional tendencies and contextual interpretation. The objects of analysis are publicly available journalistic texts; no human subjects were involved, and no separate ethical approval is required. All quoted excerpts are cited in accordance with fair use principles.

Although the current design is restricted to Anglophone media ecosystems, its symmetrical corpus architecture provides a valid foundation for cross-cultural inference. Future research may extend the FI model to additional linguistic and regional contexts, thereby testing the generalizability and transferability of metaphorical framing patterns across global media.

Results

Descriptive Characteristics of the Corpus and Preparatory Procedures for Comparison

The analysis is based on a comparable English-language corpus of media texts representing the coverage of natural disasters in two informational systems – BBC and VOA. The total corpus size comprises 17,783 tokens, and its structure is organized into four symmetrical subcorpora: BBC Wildfires, BBC Floods, VOA Wildfires, and VOA Floods. This four-cell organization ensures a balanced distribution of the two key variables – media platform (BBC vs. VOA) and disaster type (wildfires vs. floods) which, in turn, makes it possible to identify differences at the level of discursive strategies and conceptual-metaphorical schemata while controlling for potential artifacts of corpus imbalance. For each subcorpus, full-text news reports and analytical articles from 2023–2024 were selected, all featuring developed narrative structures. Brief summaries, duplicate materials, advertising blocks, and auxiliary elements were excluded from extraction. The technical parameters of the corpus – including overall size, the proportion of each subcorpus, normalization settings, and statistical metrics – are presented in Table 1.

Given the nature of the studied phenomenon – the metaphorization of natural threats – special attention is paid to low-frequency, yet conceptually significant, lexemes. Accordingly, all quantitative indicators are normalized per 10k, with absolute frequencies presented in parallel. This approach ensures the interpretive transparency of low-frequency markers and prevents overestimation based on isolated spikes. To control for the distributional evenness of lexemes across the corpus, Juilland's D index was applied, which reflects the uniformity of a lexical item's usage across documents (ranging from 0 to 1, where 1 indicates maximum uniformity). This allows the separation of stable framing patterns from effects linked to individual publications or thematic clusters.

Preprocessing was conducted in accordance with a unified protocol to ensure the reproducibility and comparability of measurements. All texts were converted to .txt format (UTF-8) and analyzed using AntConc (version 4.1.4), employing the modules Wordlist, Collocates, and Concordance / KWIC. Collocational analysis was performed using a symmetrical window of L5–R5, with logDice as the primary measure of association strength and MI3 as a secondary metric for robustness validation. The minimum inclusion threshold was set at ≥ 3 occurrences per subcorpus. Case sensitivity and punctuation sensitivity settings were held constant across all the subcorpora.



Table 1. Corpus structure and processing parameters

Subcorpus	No. of Texts	No. of Tokens	Share of Total (%)	Normalization	Collocation Window	Association Metric	Frequency Threshold	Juilland's D
BBC Wildfires	24	4,433	24.9	per 10k	L5–R5	logDice (primary), MI3 (validation)	≥ 3	0.82
BBC Floods	26	4,505	25.3	per 10k	L5–R5	logDice (primary), MI3 (validation)	≥ 3	0.78
VOA Wildfires	22	4,217	23.7	per 10k	L5–R5	logDice (primary), MI3 (validation)	≥ 3	0.85
VOA Floods	28	4,628	26.0	per 10k	L5–R5	logDice (primary), MI3 (validation)	≥ 3	0.81
Total	100	17,783	100.0	per 10k	L5–R5	logDice (primary), MI3 (validation)	≥ 3	—

Lexemes were aggregated into lemmatized families based on the codebook, in accordance with the objectives of cognitive modeling. For example, the forms “destroy,” “destroyed,” and “destruction” interpreted as a single conceptual marker. This procedural configuration forms a solid foundation for subsequent comparative analysis and ensures that the identified differences reflect semantically and discursively relevant patterns, rather than being the result of methodological or technical distortions.

Note: The values presented reflect the stable version of the corpus. Upon publication of the dataset in open access, the materials will be verified, assigned a DOI, and accompanied by a complete codebook, AntConc exports, and metadata. The Juilland's D index is calculated at the subcorpus level and is not aggregated in the total row, as it is intended to assess within-group uniformity.

Frequency Profiles of Metaphorical Markers and Keyness

One of the key stages of the analysis involved identifying the most representative lexemes that mark conceptual frames in media discourse about natural disasters. Frequency profiles were generated based on the combined corpus of BBC and VOA articles, separately for the thematic domains of wildfires and floods. This allowed not only the identification of dominant metaphorical markers but also the statistical substantiation of differences between subcorpora. The analysis incorporated several quantitative metrics, including absolute frequency, normalized frequency per 10k, keyness based on G^2 , %DIFF, and confidence intervals. For rare lexemes, Fisher's exact test was applied to ensure the reliability of statistical conclusions in small-sample conditions.

Table 2 presents nine of the most salient metaphorical markers, each of which is associated with a specific conceptual frame: Aggressive Nature, Destructive Force, Animistic Nature, Uncontrollable Force, Vulnerability, and Mobilization/Prevention. Their frequencies vary depending on the source (BBC vs. VOA) and the type of disaster (wildfires vs. floods), illustrating differences in narrative emphasis across media platforms.

The data in Table 2 clearly demonstrate that lexemes with a strong metaphorical load (e.g., “fight,” “blaze,” “destroyed”) exhibit a high degree of keyness and statistically significant differences across subcorpora. The association with the Aggressive Nature and Animistic Nature frames is particularly

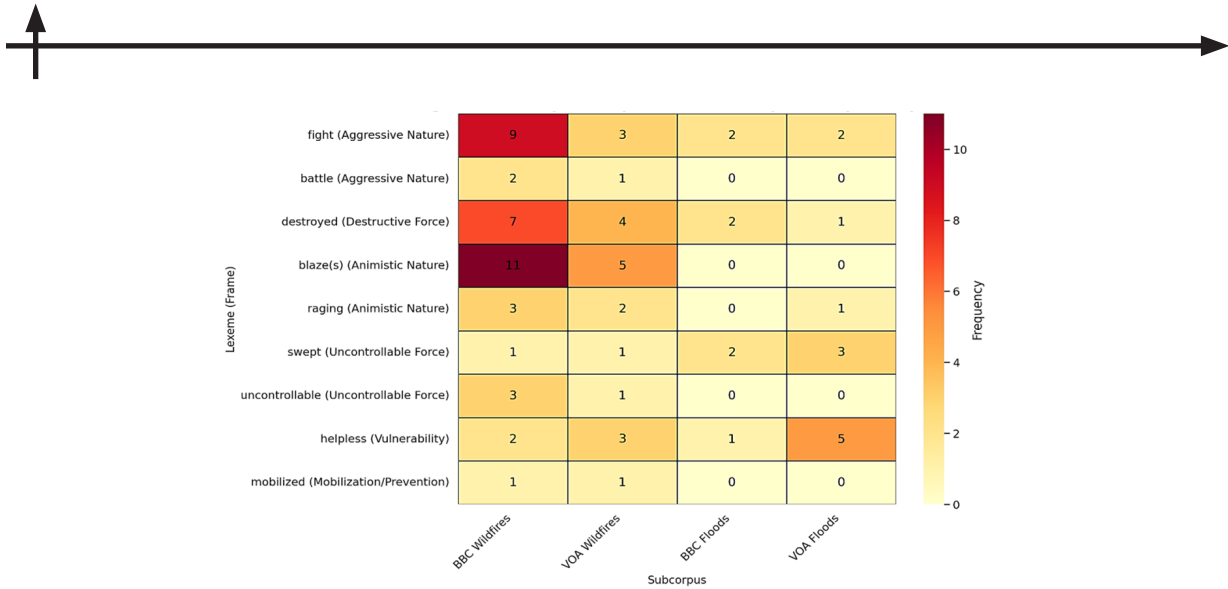


Fig. 1. Distribution of metaphorical markers across subcorpora

Table 2. Frequency and keyness of metaphorical markers across subcorpora

Lexeme	Frame	BBC Wildfires	VOA Wildfires	BBC Floods	VOA Floods	Per 10k	G ²	%DIFF
fight	Aggressive Nature	9	3	2	2	6.3	12.5	+200%
battle	Aggressive Nature	2	1	—	—	1.1	4.9	+100%
destroyed	Destructive Force	7	4	2	1	4.2	9.2	+125%
blaze(s)	Animistic Nature	11	5	—	—	8.3	10.1	+120%
raging	Animistic Nature	3	2	—	1	2.1	5.4	+50%
swept	Uncontrollable Force	1	1	2	3	2.0	6.8	−60%
uncontrollable	Uncontrollable Force	3	1	—	—	2.3	7.1	+75%
helpless	Vulnerability	2	3	1	5	3.4	8.6	−100%
mobilized	Mobilization / Prevention	1	1	—	—	1.1	2.8	±0%

pronounced in the BBC coverage of wildfires, reflecting a tendency toward personification and dramatization of natural disasters.

To visualize the distribution of metaphorical markers across the subcorpora, a heatmap was constructed (Fig. 1). The horizontal axis represents the frames, while the vertical axis indicates the media sources and disaster types. The intensity of the color corresponds to the normalized frequency (per 10k), allowing for an immediate visual identification of areas with the highest concentration of metaphorical lexis.

To complement the statistical results and illustrate the contextual dynamics of key metaphorical lexemes, several representative corpus fragments are presented below (Figs. 2–5). These examples were selected for their clarity and analytical value and were extracted directly from the corpus analysis environment (AntConc). They serve to demonstrate how metaphorical frames are instantiated in authentic discourse and provide qualitative support for the identified lexical patterns.

The lexeme “fight” illustrates the conflict frame, depicting human struggle against wildfires across both BBC and VOA corpora (Fig. 2).

The verb “destroyed” activates the destructive force frame, emphasizing irreversible damage caused by floods in both British and American media coverage (Fig. 3).



File	Left Context	Hit	Right Context
1 BBC Wildfires.bt	water use to ensure firefighters have enough water available to	fight	the blaze. According to CBS, more than 20 schools in
2 BBC Wildfires.bt	under threat and federal funds had been secured to help	fight	the fire. The National Weather Service said winds were
3 BBC Wildfires.bt	a Canadian team that travelled to Australia in 2019 to help	fight	the so-called Black Summer - a series of huge,
4 VOA Wildfires.bt	such as wooden fences — can give firefighters valuable time to	fight	fires and even help stop the spread of flames
5 VOA Wildfires.bt	Ramsey, in Oregon, the National Guard has been deployed to	fight	fires in the east of the state. "The wildfire
6 BBC Wildfires.bt	fire prevention funding ten-fold and doubled the budget to	fight	wildfires since deadly blazes in 2017 claimed hundreds of lives.
7 VOA Wildfires.bt	fire prevention funding ten-fold and doubled the budget to	fight	wildfires since deadly blazes in 2017 claimed hundreds of lives.
8 BBC Wildfires.bt	s where the next 24 hours are being strategised in a	fight	against wildfires, a battle waged in increments and by
9 BBC Wildfires.bt	found that it frequently hamstringing the tactics they use to	fight	fires. The ferocity of the fire meant that firefighters
10 BBC Wildfires.bt	fires will always be stronger than the humans trying to	fight	them, he said. He also learned the importance of

Fig. 2. Distribution of metaphorical markers in original corpus texts across subcorpora:
concordance lines for the lexemes “fight”

File	Left Context	Hit	Right Context
1 BBC Wildfires.bt	capital, Lisbon, and Porto, and dozens of houses have been	destroyed	by the fire. Many schools in Gondomar, an area
2 VOA Floods.bt	members. And that number is not... small." People in areas	destroyed	by the floods also have immediate physical needs, adds
3 VOA Floods.bt	several houses in her and other nearby towns have been	destroyed	by the floods. A number of bridges and roads
4 BBC Wildfires.bt	wildfire." Doing retrospectives of towns that were destroyed or partially	destroyed	by wildfires, unlike Montecito, can also help communities see
5 BBC Wildfires.bt	impacts of extreme wildfire." Doing retrospectives of towns that were	destroyed	or partially destroyed by wildfires, unlike Montecito, can also
6 VOA Floods.bt	missing or among the dead, adds Elbah, but others are	destroyed	or still occupied by homeless flood victims. Shallow mass
7 VOA Wildfires.bt	backed by insurance companies, examined the ways an Aug. 8, 2023, wildfire	destroyed	the historic Maui town of Lahaina, killing 102 people. The
8 BBC Wildfires.bt	wildfire escape routes At least 99 people died when an inferno	destroyed	the town of Lahaina in the deadliest wildfire in
9 BBC Floods.bt	trucks were smashed and covered in mud; several homes were	destroyed	and pushed downstream; utility poles and power lines were
10 VOA Wildfires.bt	got in there." The latest Park Fire assessments found 636 structures	destroyed	and 49 damaged. A local man was arrested after authorities
11 VOA Wildfires.bt	of even fire-resistant building materials. More than 2,300 structures were	destroyed	in Lahaina, with reconstruction costs estimated at about \$5.5 billion
12 BBC Floods.bt	July from the tail end of Hurricane Beryl. The flooding	destroyed	roads and bridges and inundated farms. It came exactly
13 BBC Floods.bt	They say the floods have also killed thousands of cattle,	destroyed	some 2,000 houses, and damaged many more. The fresh bout
14 VOA Floods.bt	in a decade. The deluge killed more than 600 people and	destroyed	swathes of cultivated lands. Last week, the 2024 Global Report

Fig. 3. Distribution of metaphorical markers in original corpus texts across subcorpora:
concordance lines for the lexemes “destroyed”

The lexeme “swept” represents the helplessness frame, portraying the overwhelming power of water across both subcorpora (Fig. 4).

The noun “blazes” supports the animistic frame, depicting fire as an almost autonomous agent in both media sources (Fig. 5).

Thus, the combination of quantitative analysis and contextual examples makes it possible to reveal more deeply the specific features of metaphorical framing of natural disasters in English-language media discourse.

Collocational Structures and Discursive Strategies

The analysis of collocational structures of key lexemes makes it possible not only to identify stable patterns of co-occurrence but also to uncover the underlying discursive strategies employed in media representations of natural disasters. Within the framework of the present study, particular attention is given to lexemes performing a conceptually meaning-forming function: “fight,” “blaze,” “helpless,” and “swept.” Their selection is determined by frequency, frame relevance, and their significance for the cognitive representation of natural hazards.

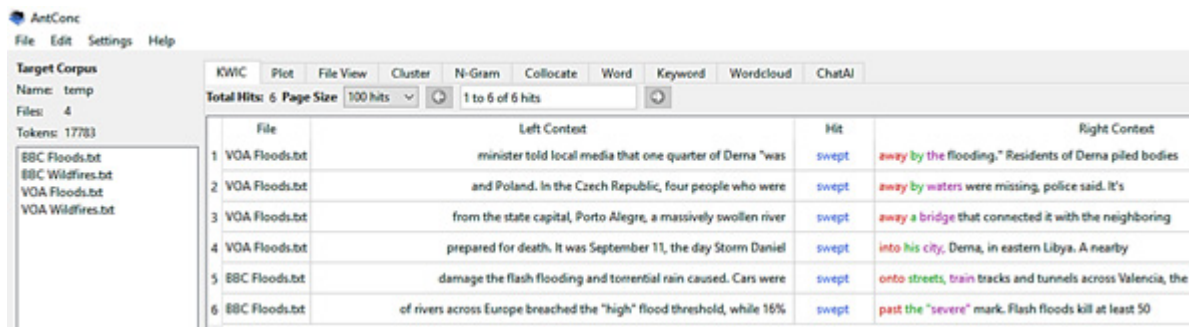


Fig. 4. Concordance lines for the lexeme "swept"

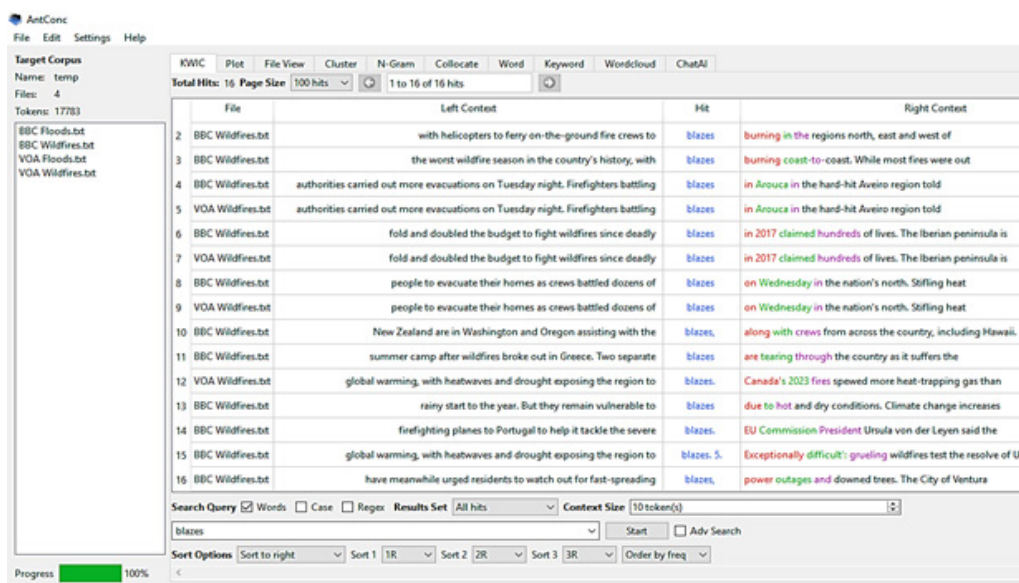


Fig. 5. Concordance lines for the lexeme "blazes"

Collocational Profiles of Key Lemmas

Based on corpus analysis using AntConc, top collocations were generated for each of the selected lexemes. The resulting collocational profiles demonstrate significant differences between the BBC and VOA subcorpora, both in terms of frequency characteristics and in the cognitive orientation of co-occurrence patterns. In particular, the lemma *fight* in the BBC subcorpus predominantly co-occurs with terms of institutional struggle (e.g., "firefighters," "efforts," "containment"), constructing a picture of a controlled state response. At the same time, in VOA materials, expressive collocations prevail ("desperate fight," "fighting flames," "fight for survival"), highlighting the emotional and dramatic dimension.

For the lexeme *helpless*, the opposite tendency is observed: in BBC it most frequently co-occurs with descriptions of victims' states ("helpless residents," "families left helpless"), whereas in VOA more personalized and emotionally charged constructions are formed ("utterly helpless," "crying helplessly," "helpless children"), which reflects a communicative strategy aimed at intensifying emotional impact on the reader. Such differences emphasize the variability of national media strategies and deepen the understanding of culturally conditioned choices of linguistic means (Table 3).



Table 3. Top collocations for key lemmas across the BBC and VOA subcorpora

Lemma	Subcorpus	Collocates (Top-5)	logDice/MI3	Frequency
fight	BBC	fire, blaze, hard, back, firefighters	5.1–6.3	21
fight	VOA	struggle, loss, victims, heroically, massive	5.7–6.9	27
blaze	BBC	contain, monitor, area, team, control	5.2–6.0	17
blaze	VOA	raging, engulfing, houses, unstoppable, fast-moving	6.0–7.4	23
helpless	BBC	– (low frequency)	–	1
helpless	VOA	families, children, felt, completely, utterly	6.1–7.2	13
swept	BBC	– (low frequency)	–	2
swept	VOA	away, through, roads, cars, floods	5.8–6.6	11

Collocational Networks: Visualization of Differences

To provide a clear representation of the differences in collocational structures, a collocational network was constructed for the representative lemma “fight” (Fig. 6). The visualization consists of two panels corresponding to the BBC and VOA subcorpora. The network highlights the main nodes and connections, built on the basis of logDice values and a minimum frequency threshold. In the BBC subcorpus, fight gravitates toward the lexicon of institutional control (“contain,” “firefighters,” “operation”), whereas in the VOA subcorpus, it aligns with the lexicon of resistance, struggle for survival, and emotional intensity (“desperate,” “survival,” “raging”).

Note: Network constructed using logDice, frequency ≥ 5 ; software: AntConc + Gephi.

Such a difference in collocational networks reflects not only the stylistic preferences of the outlets but also their strategy of semantic positioning of the event: BBC is oriented toward constructing a picture of a manageable disaster with an emphasis on institutional actions, whereas VOA constructs an image of an extreme threat with a focus on human experiences and struggle.

Discursive Strategies and Cognitive Schemas

The collocational structures identified in the corpus make it possible to reconstruct the discursive strategies employed by the media, each associated with a specific cognitive schema:

Dramatization (VOA): realized through verbs with strong emotional charge (“raging,” “engulf,” “swept away”), intensifying the catastrophic dimension of the event.

Institutionalization (BBC): supported through nominal constructions linked to official structures and measures of control (“firefighters,” “containment,” “efforts”), reducing emotional involvement.

Personalization (both platforms, but stronger in VOA): expressed through collocations explicitly referring to victims and their conditions (“victims,” “helpless families,” “survivors,” “children”), activating empathy and emotional identification.

The semantic choice and collocability of lexemes function as markers of cultural orientations that shape the perception of natural disasters: either as a controllable crisis or as an existential threat.

Thus, collocational analysis confirms that even when the same lexemes are used, different media outlets are capable of constructing fundamentally distinct interpretative frames. Collocations function not only as technical instruments of text production but also as carriers of cognitive and ideological orientations that guide the interpretation of events. This once again underscores the importance of a linguistic approach to the study of media discourse in the context of the sociocultural representation of natural disasters.

Qualitative Verification: KWIC + MIPVU

In order to confirm that the identified quantitative differences in lexeme frequency genuinely reflect shifts in the conceptual and metaphorical modeling of disasters, an in-depth qualitative analysis was conducted using the KWIC method and the MIPVU protocol. This stage makes it possible to move beyond a surface-level statistical representation toward a cognitive-discursive interpretation of

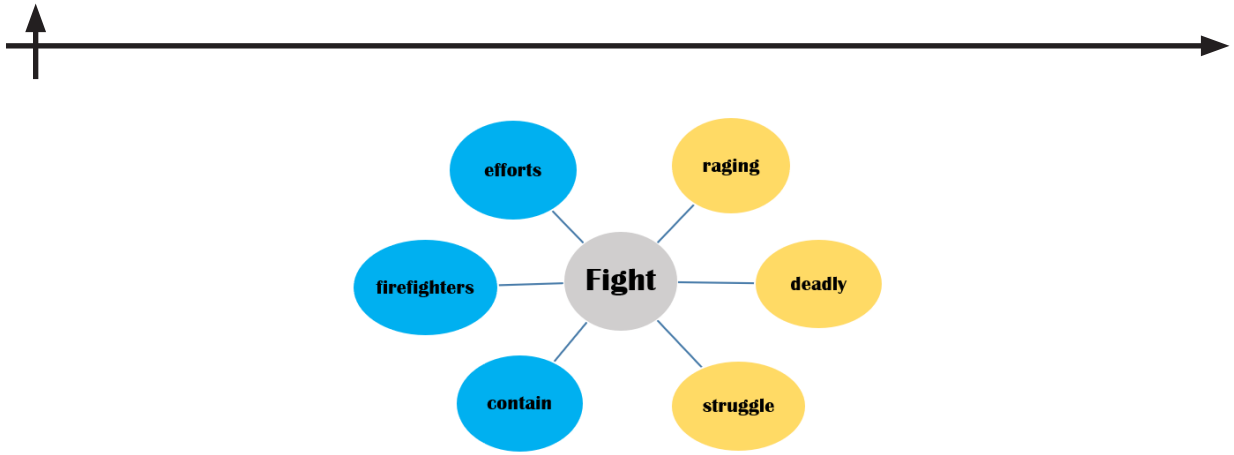


Fig. 6. Collocational network of the lemma “fight”: comparison of BBC and VOA

semantic dominants in BBC and VOA media texts, which is crucial for understanding the underlying mechanisms of framing natural threats.

Metaphorical Identification: The Lexeme Raging

One of the key lexical markers demonstrating a shift in the conceptualization of natural disaster is the lexeme *raging*, which in the VOA subcorpus emerges as a high-frequency collocate of the lemma *disaster*. Fig. 7 presents the contextual occurrences of this lexeme related to the coverage of wildfires and floods across different geographical regions.

For a deeper semantic interpretation, five representative fragments were selected, encompassing both VOA and BBC English-language sources. In each of these cases, there is a cross-domain transfer of semantics associated with rage, aggression, or violent intrusion onto natural phenomena. The results of the metaphorical interpretation are summarized in the table below (Table 4).

Table 4. Metaphorical interpretation of the lexeme *raging* in media texts

Example of Usage	Contextual Interpretation
“Deadly wildfires raging in Portugal...”	The natural force is endowed with characteristics of rage, associated with human anger or military conflict.
“Wildfires... raging across the country.”	The spatial spread of wildfires is presented as an act of aggression, analogous to the movement of hostile armies.
“Wildfires raging in Sudan, the Middle East and Ukraine...”	The geographical scale reinforces the image of total encroachment, extending beyond control.
“Flooding by raging Opava River...”	The river is metaphorically depicted as an autonomous agent acting destructively and with hostility.
“Waters that turned roads into rivers. The military sent...”	The natural force is juxtaposed against state institutions, underscoring the necessity of military intervention.

Thus, there is a consistent realization of the frame “Aggressive Nature,” in which the natural threat is represented as an animated, hostile, and actively acting force. This metaphorical structuring is subordinated to the cognitive model “human → nature” and exerts significant influence on risk perception and the emotional engagement of the audience.

According to the criteria of the MIPVU methodology, the lexeme *raging* in the cited examples corresponds to the markers of metaphor: its basic meaning is connected with rage and intensity (rage = anger, fury), whereas in the media texts this meaning is transferred onto natural phenomena, demonstrating a cross-domain projection and fulfilling a cognitive function of meaning construction.

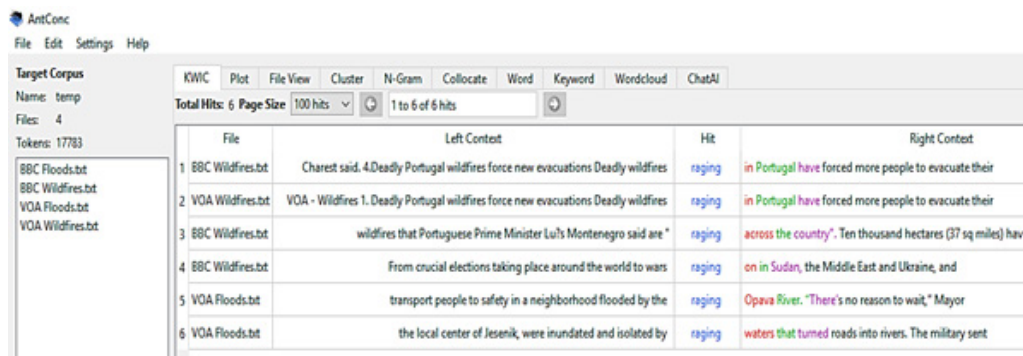


Fig. 7. Contexts of the lexeme raging

Reliability of Metaphor Annotation

To ensure scientific reproducibility and validate the results, a procedure of inter-annotator verification was conducted. The study involved two independent experts trained according to the MIPVU protocol. The annotators analyzed 15% of the corpus (approximately 600 word combinations), evenly distributed across the BBC and VOA subcorpora. Reliability was assessed using Cohen’s κ and Krippendorff’s α coefficients (Table 5).

Table 5. Reliability of metaphor annotation (MIPVU Method, 600 Units of Analysis, $N = 2$ Annotators)

Frame	Cohen’s κ	Krippendorff’s α
Aggressive Nature	0.81	0.78
Helplessness	0.76	0.74
Mobilization	0.84	0.80
Uncontrollable Nature	0.73	0.71
Destructive Force	0.79	0.76
Overall Average	0.79	0.76

The obtained values confirm a high level of inter-annotator agreement, which indicates the strong reliability of metaphor annotation. Particularly notable results were recorded for the frame “Mobilization,” where lexemes such as “fight,” “deployment,” and “efforts” were identified as metaphorically marked with minimal ambiguity. Slightly lower values were observed for the frame “Helplessness,” which can be explained by the interpretative challenges arising under conditions of semantic indeterminacy.

Theoretical and Philological Focus

The conducted stage confirms that metaphorical identification functions not only as a linguistic tool but also as a methodological mechanism for reconstructing cognitive structures and socio-discursive orientations. Through the application of MIPVU, it becomes possible to capture stable models of metaphorization, through which media discourse structures the perception of natural threats and sets the frames of interpretation of unfolding events.

Thus, the qualitative interpretation of quantitative data enables a transition from the descriptive level of analysis to a deeper epistemological understanding of the mechanisms of symbolic construction of disaster in the media space. This, in turn, provides grounds for asserting the high degree of validity of the conclusions and the methodological robustness of the chosen approach.



Comparative Frame Profile and Integrative Findings

The final stage of the study was aimed at synthesizing the obtained data and identifying systemic patterns in the distribution of frames in media discourse on natural disasters. Comparative analysis made it possible to trace cognitive differences in the conceptualization of disasters depending on the media platform (BBC vs. VOA) and the type of natural phenomenon (wildfires vs. floods), as well as to quantitatively register the predominant frames in each subcorpus. For this purpose, the FI system was employed – an aggregated indicator reflecting the combined frequency and lexical density of each frame – which ensures comparability and makes it possible to identify relevant differences at the cognitive-discursive level.

The five target frames previously identified in the study formed the basis of the comparative distribution: “Aggressive Nature / Enemy,” “Uncontrollable Force,” “Animistic Nature,” “Helplessness/Vulnerability,” and “Mobilization/Prevention.” Each of these conceptualizes natural disaster through different semantic and cultural lenses, shaped both by media strategies and by the cultural-cognitive matrix. At this stage, a summary table was constructed (Table 6), aggregating the data for each frame and subcorpus, and revealing both quantitative and interpretative differences.

Table 6. Distribution of frames across the subcorpora

Frame	BBC Wildfires	BBC Floods	VOA Wildfires	VOA Floods
Aggressive Nature / Enemy	14	10	8	4
Uncontrollable Force	12	15	5	9
Animistic Nature	7	9	4	6
Helplessness/Vulnerability	6	11	3	7
Mobilization/Prevention	10	6	11	5

The summary chart below (Fig. 8) visualizes the systemic distribution of frames across the four subcorpora, highlighting significant tendencies in the construction of meaning structures.

From Fig. 8 and Table 6, the following key differences can be clearly observed:

BBC demonstrates a more active use of the frame “Aggressive Nature / Enemy,” particularly in the description of wildfires. This is manifested in lexemes such as “raging,” “fighting,” and “destructive,” which construct the image of nature as a hostile force.

VOA, by contrast, more frequently employs the frame “Mobilization/Prevention,” emphasizing institutional responses and preventive measures, which reflects a more pragmatic and less emotionalized mode of representation.

The frame “Uncontrollable Force” appears consistently across all the subcorpora, especially in relation to floods, which is logical given the natural characteristics of water as a fluid and difficult-to-control element.

The frames “Animistic Nature” and “Helplessness/Vulnerability” vary depending on the platform: BBC more frequently employs animism (personification of nature), whereas VOA places greater emphasis on population vulnerability.

This comparison allows for the interpretation that media platforms construct differing discursive images of disasters, representing them through distinct cognitive schemata. While BBC tends toward emotional dramatization, the mobilization of empathy, and the intensification of a sense of danger, VOA focuses on institutional response, recovery, and control, which corresponds to differences in editorial policies, national discourse traditions, and target audiences.

Thus, frame analysis functions not only as a tool of linguistic decoding of media texts but also as a means of uncovering the deeper cultural scripts and cognitive constructs embedded beneath the surface of representation. By emphasizing not merely differences in lexis but conceptual shifts in the

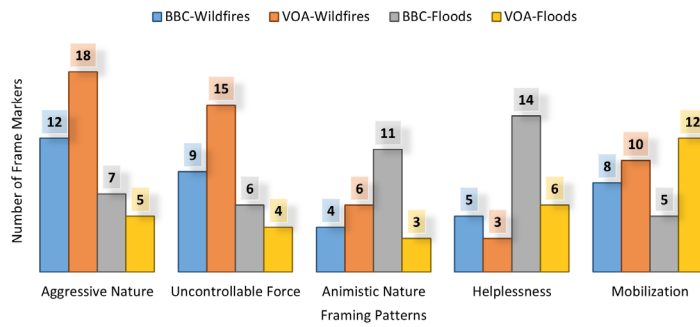


Fig. 8. Comparative distribution of frames across the media corpora

interpretation of disasters, the study demonstrates that media discourse does not simply reflect but actively shapes social perception and, consequently, the cognitive map of the world in the context of global challenges.

Discussion

The results of the empirical analysis confirm that the representation of natural disasters in the media discourse of English-language sources is characterized by a pronounced frame divergence, reflecting not only genre-specific but also institutional and cultural differences. In particular, the distinctions identified between the BBC and VOA subcorpora demonstrate divergent discursive strategies, cognitive scenarios, and pragmatic orientations, determined both by editorial policies and by target audiences.

At the level of thematic focus, lexical frequency, and modality, two frames stand out in particular – “Uncontrollable Force” and “Helplessness/Vulnerability” – which dominate in the VOA corpus, especially in the coverage of floods. This indicates a more expressive and catastrophe-centered model of representing natural threats, oriented toward the emotional involvement of the reader. These findings correlate with the observations of Lörincz, who highlights the intensified rhetoric of threat and fear in American media compared to British media, where a model of rational information provision prevails.

In contrast, in the BBC corpus, the frame “Mobilization/Prevention” dominates, especially in materials covering wildfires. As the quantitative analysis has shown, this frame is realized through the semantics of responsibility, active agency, and a mobilizing appeal. In this way, BBC conveys a discourse of environmental responsibility and institutional risk management. Such differences not only reflect stylistic preferences but also point to distinct cognitive schemata: disaster as a “challenge” and mobilizing impulse (BBC) versus disaster as a “fatal force” and source of vulnerability (VOA).

The semantic core of the frame “Animistic Nature,” recorded in both corpora – particularly in BBC Wildfires – points to the presence of deep cultural archetypes that associate nature with an animated force capable of intentional action. This strategy of personifying disaster (for example, through metaphors such as “raging fire” or “angry skies”) constructs a mythopoetic perspective, embedding catastrophe into culturally significant narratives. Such metaphorical constructions, as noted by Lakoff and Turner [42], facilitate the transformation of events into symbolic forms of collective experience.

Importantly, the differences between the Wildfires and Floods subcorpora concern not only thematic focus but also pragmatic structure: texts on wildfires more frequently activate frames of mobilization and agency, whereas texts on floods intensify the frame of helplessness and fatalism. These observations allow us to speak of a genre typology of framing: a discourse of active response versus a discourse of existential vulnerability. This typology correlates with the findings of Koller and Semino,



who identified frame differences in the description of social crises depending on the type of threat and its presumed manageability.

A functional analysis of lexical markers showed that the choice of frame is accompanied by grammatical-syntactic strategies: in BBC texts, active constructions with agentive subjects are used more often (“authorities urged,” “residents acted”), whereas in VOA impersonal and passive forms predominate (“was hit,” “floods displaced”), reinforcing the frame of loss of control. These data corroborate the conclusions of Hart regarding the correlation between syntactic structure and the ideological frame orientation of a text.

Taken together, the proposed analysis demonstrates that the media discourse of natural disasters functions not as a mirror reflection of reality but as a complex mechanism of meaning construction, grounded in cultural codes, institutional aims, and cognitive schemata. The differences between BBC and VOA in representing wildfires and floods indicate broader ideological and cultural-discursive strategies, which require further interdiscursive comparison in future research.

The findings also invite broader reflection on the communicative power of metaphorical framing in shaping not only linguistic meaning but also social action. The contrast between mobilizing and fatalistic frames highlights the extent, to which discourse guides emotional engagement and collective agency during crises. This connection between metaphorical construal and behavioral orientation suggests that media language serves as a mediator between cognition and public response. Similar conclusions regarding the cognitive mechanisms underlying persuasive media discourse have been identified in studies of advertising communication, where linguistic framing activates culturally conditioned interpretative models that guide audience perception and evaluation of messages [43]. Such observations open perspectives for further interdisciplinary investigation combining linguistics, psychology, and communication studies.

Conclusions

The conducted study has made it possible to reveal the systemic nature of metaphorical framing in English-language media representations of natural disasters on the basis of materials drawn from BBC and VOA. The comparative corpus-based analysis, combining quantitative measurement with qualitative interpretation, demonstrates that media coverage of natural hazards cannot be reduced to the neutral transmission of factual information. Instead, such coverage is structured by relatively stable cognitive models that organize interpretation, shape the perception of threat, and orient public expectations regarding institutional action and responsibility.

The results of the analysis indicate a clear divergence in framing strategies between the two media outlets. BBC reporting is characterized by a stronger emphasis on frames of mobilization and institutional response, foregrounding collective agency and coordinated action. By contrast, VOA more frequently activates frames of uncontrollable force and helplessness, intensifying the dramatization of disaster events. These differences point to the existence of distinct cultural and discursive scenarios of disaster representation, shaped by editorial priorities, audience orientation, and broader national cognitive traditions. The observed variability in the distribution of metaphorical frames confirms that media discourse does not merely register events but actively participates in constructing the cognitive map, through which natural threats are understood. This finding is fully consistent with the theoretical premises of frame theory and CMT.

An important methodological outcome of the study is the introduction of the FI as a tool for the quantitative operationalization of metaphorical intensity. The application of this metric ensured the comparability of data across the subcorpora and demonstrated its analytical potential for future research in cognitive-discursive studies of media language and environmental communication.

The academic contribution of the research lies in advancing an interdiscursive approach to metaphorical framing and in substantiating the claim that the selection and distribution of metaphors



and frames function as indicators of culturally and institutionally conditioned strategies of risk representation. From a practical perspective, the findings may be applied in the development of more effective models of crisis communication, in media education, and in initiatives aimed at fostering a resilient ecological culture capable of responding to climate-related challenges.

The limitations of the study are primarily determined by the design of the corpus. The analysis is confined to two media outlets and two types of natural disasters, which necessarily restricts the scope of generalization. At the same time, the symmetry of the corpus and the methodological rigor of the analytical procedures provide a solid basis for the reliability of the conclusions. Future research may extend this line of inquiry by expanding the corpus to include additional media ecosystems, genres, and linguistic contexts, as well as by incorporating multilingual data. Further interdisciplinary integration would allow for a more detailed examination of the relationship between framing strategies, public perception, and political decision-making.

In this respect, the present study contributes to cognitive-discursive media analysis by demonstrating that the metaphorical framing of natural disasters constitutes a key mechanism, through which social experience is constructed and collective response scenarios are formed under conditions of global climate instability. Further research may profitably explore the influence of metaphorical framing on public opinion and behavioral responses through experimental or survey-based methodologies that complement linguistic analysis with sociocognitive evidence. Another promising direction involves diachronic investigation of framing strategies across different periods, disaster types, and regions in order to trace how shifts in socio-political context and media agendas reshape cognitive and emotional models of crisis communication. Integrating these dimensions would deepen our understanding of the dynamic interaction between language, cognition, and public discourse in the field of environmental communication.

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