Photojournalistic Representations of Climate Change and COP26: A Social Semiotic Multimodal Analysis

Abstract

This paper analyses photojournalistic representations of arguably the most pressing issue faced by modern society: climate change. It also critically evaluates representations of COP26, the annual climate change conference held most recently in Glasgow during November 2021. Using a hybrid framework of Social Semiotic Multimodality, this study examines how digital representations of environmental risk shape public perceptions and actions to it. Drawing on datasets from Climate Visuals, The Guardian, and The Times, connections between multimodal texts and their wider socioenvironmental context are made, and issues of power in the construction and dissemination of environmental journalistic meaning are considered. Paramount to these perceptions, connections, and issues is the eco-semiotic concept of *cultural evaluations*, such as consumerism and corporate capitalism, which this paper argues have been responsible for extensive ecological damage. However, this study identifies the emergence of a new cultural evaluation, *pro-environmentalism*, and posits that its internalisation into the current zeitgeist can shift behaviours towards environmental preservation. Overall, it suggests that accurate, compelling photojournalistic representations have the capacity to propagate pro-environmentalism, primarily by increasing public scrutiny towards climate change policy and legislation, and secondarily by enhancing public understanding of the devastating impact of climate change, both on a humanised and naturalised level.[1]

Keywords: COP26, climate change, photojournalism, Social Semiotics, Multimodality, Eco-Semiotics, cultural evaluation

[1] **Acknowledgements**

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1. Introduction

In 2022, the pressing urgency of the climate crisis needs little contextualisation. Rising global temperatures are catalysing numerous physical and social issues, including conflict, terrorism, food and water scarcity, economic disruption, and an intensification of natural disasters (Kythreotis et al., 2021). Glaciers and ice sheets in polar regions are melting, adding to sea level rise (SLR), which threatens almost two-thirds of the world's cities located in coastal areas (United Nations, 2021). Should humankind continue along the current path, severe flooding will displace millions of people within the next thirty years. As a result of human production of coal, oil, and gas, billions of tonnes of greenhouse gases are being released into the atmosphere each year. If such emissions are not lowered, global temperatures could reach 3°C by 2100, inflicting irreparable ecosystemic damage (Lehman et al., 2019).

For the worst of this damage to be mitigated, the Intergovernmental Panel on Climate Change (IPCC) has mandated a global temperature target of 1.5°C above pre-industrial levels (IPCC, 2018). Since the Industrial Revolution, human activities have caused the world's surface temperature to rise by around 1°C (estimations range from 0.8°C to 1.2°C), a small number with a severe environmental impact (ibid., p. 4). At COP16 in Cancún, pledges were made to limit global temperatures to 2°C (United Nations Framework Convention on Climate Change, 2010). However, the 2°C target was proven insufficient by the IPCC's (2018) 'Special Report on Global Warming of 1.5°C', which illustrated that the differences between a world of 2°C rather than 1.5°C would be catastrophic. Specifically, this 0.5°C rise would be felt in an increase of species extinction among terrestrial biodiversity and ecosystems (ibid., p. 8), a wider-ranging impact of SLR small islands, low lying coastal areas, and deltas (ibid., p. 7), an exacerbation of climate-related risks to global health, livelihoods, food security, water supply, and economic stability (ibid., p. 9), as well as a magnified risk to marine biodiversity, fisheries, and ecosystems due to decreased ocean oxygen levels, and rises in ocean temperature and acidity (ibid., p. 8).

Since the IPCC's report (2018), 'the 1.5°C temperature target' has been a primary focal point of much environmental publicisation, policymaking, and legislature. Most scientists project that limiting global warming to 1.5°C would avert the worst impacts of climate change, but also that, at the current rate, global warming will reach 1.5°C between 2030 and 2052 (ibid., p. 4). Consequently, the 1.5°C target has featured as a prominent point of urgency at the United Nations' (UN) conventions, including the most recent – the twenty-sixth UN 'Conference of the Parties' (hereafter 'COP26'), held in November 2021, in Glasgow, Scotland.

One of the largest causes of uncertainty regarding long-term environmental degradation is its indiscernibility. Despite fuelling natural, economic, and sociopolitical disasters, climate change is tricky to pinpoint, and trickier still to depict. This study analyses how digital representations of environmental risk shape public perceptions and actions to it. It examines the connections between multimodal texts and their wider socioenvironmental context, considering issues of power in the construction and dissemination of ecological

journalistic meaning. The theoretical framework of Social Semiotics is adopted (e.g. Hodge and Kress, 1988; Jewitt and Henriksen, 2016), supported by analytical concepts from Multimodality (e.g. Kress and van Leeuwen, 2001; 2021). Research from Eco-Semiotics (e.g. Maran and Kull, 2014; Stibbe, 2020) and Environmental Communication (e.g. Olausson, 2010; Schäfer and Schlichting, 2014) is also incorporated. This study posits that these digital representations have the capacity to increase public understanding of climate change by making associations to examples of its damage through realistic, humanised signs.

As demonstrated by Stamm et al. (2000), Sampei and Aoyagi-Usui (2009), and Anderson (2013), the media has a significant influence in shaping public understanding of climate change. Individual experiences also affect how people conceptualise the natural world, but news media remain a core intermediary in such a process (Carvalho, 2006; Olausson, 2011). While there has been copious research into the linguistic representations of climate change (Berglez, 2011; Stibbe, 2020; Appelgren and Jönsson, 2021), the visual representations of these discourses have often been overlooked (Lehman et al., 2019) or manipulated for promotional purposes (Hansen and Machin, 2008). This paper addresses this oversight, conducting a contrastive multimodal analysis of the recently compiled 'Visualising Climate Change' collection by Getty Images and Climate Visuals (2021), The Guardian's coverage of COP26 (Hilaire, 2021), and The Times' coverage of COP26 (Spencer, 2021). Recommendations are then made regarding the translation of hard-to-grasp eco-scientific concepts into digestible, accessible images, and how this might reconstrue a new cultural evaluation of *pro-environmentalism* which supports a profound personal connection to natural spaces (Stibbe, 2020). Without such a re-evaluation, shifting generational attitudes and behaviours towards ecological preservation will prove problematic, and humankind's future on Planet Earth will be placed under further jeopardy.

2. Theoretical Background

This paper draws on Social Semiotics in its analysis of the power asymmetries fuelling the current devastation of the environment (Hodge and Kress, 1988; Jewitt and Henriksen, 2016). Given its conceptual origins in linguistics (Jewitt and Henriksen, 2016, p. 145), notably in the work of Halliday and Matthiessen (2014), Social Semiotics is a suitable framework for a monomodal analysis of the linguistic representations of climate change and COP26. In order to explore how connections between the selected datasets and their socioenvironmental context are established across *all* modes, extending the scope of analysis to include non-linguistic modes of eco-journalism (predominantly imagery and illustrations), Social Semiotics is combined with Multimodality, defined by Bateman et al. as 'a way of characterising communicative situations … which rely upon combinations of different "forms" of communication to be effective' (2017, p. 8). Adaptations of Social Semiotic Multimodality as a hybrid framework have also proven to be effective in previous applied studies (Bateman et al., 2007; Machin and Ledin, 2020; Jewitt and Henriksen, 2016).

While there is a wealth of studies based on Saussurean and Peircean semiotics (e.g. De Pascale and Dattilo, 2020), they are rarely concerned with issues of power, inequality, and

social justice. This paper aligns itself with current approaches in Social Semiotic Multimodality which are predicated on these issues. One of such views, Kress and van Leeuwen's (2021) non-linguistic "grammar" of images, employs Systemic Functional Linguistics to construct a framework adaptable to modern forms of Social Semiotic Multimodality. Kress and van Leeuwen (2021) informatively draw on Hallidayan semiology (Halliday and Matthiessen, 2014) to analyse both the written word and the visual image within their multimodal framework. Unlike Barthes (1972), who predicated the meaning of images on their relation to verbal text, giving prominence to the written word, Kress and van Leeuwen (2021) describe a non-linguistic structure of pictures, considered in their own right and in their interaction with other semiotic resources. In continuity with Halliday and Matthiessen's (2014) meta-semiotic functions, this study distinguishes between the textual, interpersonal, and ideational functions. Specifically, Halliday (ibid.) suggests that every sign produces a structured text (*the textual*, pp. 88–133), positions the viewer in relation to something or someone (*the interpersonal*, pp. 134–210), and reveals something about the world (*the ideational*, pp. 211–358).

An image's *validity* indicates its level of authenticity or naturalness as a visual representation of a real-life phenomenon (Kress and van Leeuwen, 2021, p. 151). Validity is shaped by *validity markers*, also known as modality markers, which are sub-divided into eight 'scales', which viewers draw on to form modality judgements (ibid., p. 156).

Validity Marker	**Definition**
1) Colour Saturation	Scale running from 'full-colour saturation to the absence of colour' (ibid.).
2) Colour Differentiation	Scale running from a 'maximally diversified range of colours to monochrome' (ibid.).
3) Colour Modulation	Scale running from 'fully modulated colour to plain, unmodulated colour' (ibid.).
4) Contextualisation	Scale running from 'the absence of background to the most fully articulated and detailed background' (ibid.).
5) Representation of Detail	Scale running from 'maximum abstraction to maximum representation of detail' (ibid., p. 157).
6) Depth	Scale running from 'the absence of depth to a maximally deep perspective' (ibid., p. 158).
7) Illumination	Scale running from 'the fullest representation of the play of light and shade to its absence' (ibid., p. 158).
8) Brightness	Scale running from 'a maximum number of different degrees of lightness and darkness, to just two degrees: black and white, or dark grey and lighter grey, or two brightness values of the same colour' (ibid.).

Table 1. Kress and van Leeuwen's eight validity markers (2021, pp. 156–158)

Aside from Social Semiotic Multimodality, this study also draws on the relevant sub-branch of Eco-Semiotics. Defined by Maran and Kull as 'a branch of semiotics that studies sign processes as responsible for ecological phenomena' (2014, p. 41), Eco-Semiotics lends itself aptly to this research, particularly its concept of *evaluations*. As internal narratives

regarding the morality of an issue or idea, evaluations are entirely associatory, based on memories and feelings, rather than a comprehensive weighing-up of evidence (Stibbe, 2020). When these associations of what is good or bad become conventional across a society, Eco-Semioticians characterise them as *cultural evaluations* (ibid.). This concept is not dissimilar from Barthes' *naturalisation*, in which societal viewpoints, or 'myths', become so intrinsically woven into the fabric of civilisation that their existence is no longer questioned, but assumed (1972, p. 143).

In other words, cultural evaluations are the stories lived by numerous people in a culture, influencing how they think, talk and act. Changing the stories that individuals and nations live by changes the individuals and nations themselves (Stibbe, 2020). For instance, cultures can be driven by the 'prosperity story', which promotes financial and material acquisition (capitalist consumerism); the 'security story' which prioritises substantial police and military forces for protection (isolationism) or domination (expansionism); or the 'biblical story', which focuses on the after-life instead of the current state of the world (Korten, 2006). Kingsnorth and Hine (2009) also illustrate the danger of the 'human centrality story', which perpetuates the self-destructive ideology that humans are destined to unconfinedly lord over the Planet and its 'lesser' species. As put by Harari (2014, p. 466), this story has seen humans become 'self-made gods with only the laws of physics to keep us company…we are consequently wreaking havoc on our fellow animals and on the surrounding ecosystem'.

This paper argues that an amalgamation of these dysfunctional cultural evaluations has been responsible for extensive ecological damage. However, through compelling, emotive representations of climate change, it identifies the emergence of a new cultural evaluation: pro-environmentalism. Within this study, the application of pro-environmentalism concords with previous related uses of the term, such as Holbert et al.'s (2003) 'pro-environmental behaviours', and Norton and Hulme's (2019) 'eco-activist' ideology, in that it denotes a cultural evaluation with the potential to shift sociocultural behaviours away from hedonistic consumption towards environmental preservation, regreening, and rewilding.

3. Methodology

Rather than aiming to contribute to the understanding of Multimodality itself, or to the advancement of a multimodal theory, this study applies the abovementioned concepts from Multimodality, Social Semiotics, and Eco-Semiotics as a toolkit to investigate its assigned research focal points. In other words, it comes under the branch of *using* Multimodality, as opposed to *doing* Multimodality (Jewitt and Henriksen, 2016). Using qualitative datasets, this paper illustrates connections between selected examples of photojournalism, multimodal newspaper coverage, and the broader context of environmental risk, ecological damage, and climate change. As a theoretically grounded study, it uses these examples to illustrate abstract concepts in their physical "incarnations".

This research uses three datasets comprised of multimodal artefacts. The first dataset examines photojournalistic representations of climate change itself, with five captioned images taken from the Climate Visuals (2021) exhibition: 'Visualising Climate Change'. Climate Visuals is a project run by Climate Outreach, an organisation of social scientists and communications specialists who aim to engage the public with climate change (Climate Outreach, 2021). Partnered with Getty Images, a global leader in stock photography used for mass media, advertising, and promotional material, this collection offered grants to 'photojournalists from around the world who are working to advance the visual narratives that define the global climate crisis', with one-hundred images chosen by a panel of experts (Climate Visuals, 2021). Its overall aim is 'to transform depictions of complex climate issues to ensure greater efficacy, immediacy and drive positive change', with the winning photos compiled into several exhibits which were displayed at COP26 – in the 'Blue Zone', the 'Leaders' Lounge', the Catering and Coffee area, and the 'Green Zone' (Climate Visuals, 2021).

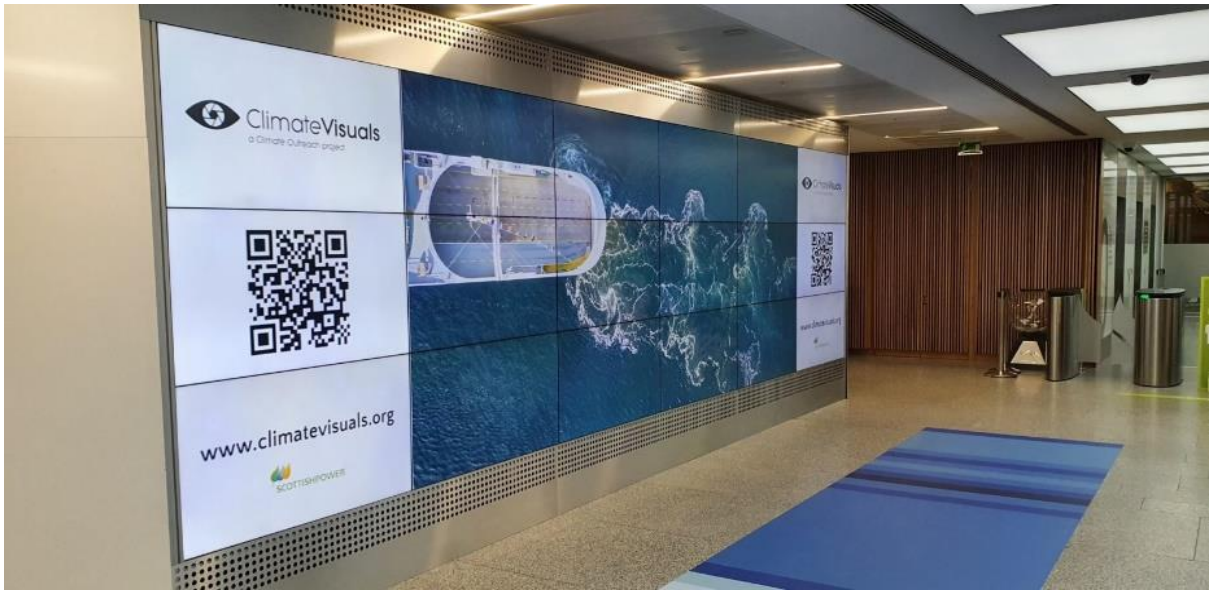

Image 1. An exhibit from Climate Visuals in the COP26 foyer (Climate Outreach, 2021)

Image 2. A Climate Visuals team member talking about the collection at COP26 (Climate Outreach, 2021)

Image 3. Attendees walking past the exhibit in COP26's 'Blue Zone' (Climate Outreach, 2021)

Out of these one-hundred captioned images, the five selected for Dataset 1 (not including the three images depicted above) were based on two criteria. Firstly, the image had to contain a sufficient depth of multimodal resources for analysis, pertaining to Halliday and Matthiessen's (2014) meta-semiotic functions. Secondly, these resources had to contextually relate to ecological issues, extending the scope of the photograph to its wider socioenvironmental implications.

The second and third datasets examine the representations of world leaders, delegates, and officials discussing how to tackle climate change. Dataset 2 comes from The Guardian's 'COP26 – in pictures' publication on 13 November, the day after the final negotiations (Hilaire, 2021). Three captioned images were selected based on the same two criteria as above. As the UK's sixth most prevalent newspaper, with over 27 million monthly print and online readers, The Guardian has a significant impact on the British public's opinions of climate change, particularly amongst adults aged thirty-five or older with a left-leaning political orientation (Statista, 2021a). According to Appelgren and Jönsson's (2021) study, informative representations of environmental risk are *likelier* to originate from journalistic institutions of a liberal, progressive stance (see also Norton and Hulme, 2019, p. 117, Figures 1 and 2). However, in order to capture a complementary sociopolitical demographic and achieve a more balanced representation, three more captioned images were selected from The Times' 'Cop26 Analysis' publication on 14 November (Spencer, 2021), based again on their depth of multimodal resources and relevance to socioenvironmental issues noted above. With a monthly readership of just under 15 million, The Times also influences the UK public's perceptions of climate change and political leaders' response to it, especially amongst adults of a centre-right political stance (Statista, 2021a).

These three datasets (eleven images in total) have been selected in conjunction with one another because of their simultaneously overlapping and conflicting perspectives. While Climate Visuals' 'Visualising Climate Change' is a photographic exhibition, The Guardian and The Times' articles contain more features of a multimodal journalistic piece, although they are more image-oriented than most standard media articles (Bateman et al., 2007). Even though The Guardian is a larger organisation with a wider set of aims, including 'giving a voice to the powerless', and 'holding power to account' (The Guardian, 2021), it publishes comparable climate imagery to Climate Visuals. According to Climate Outreach's website (2021), their delivery of a workshop to some of The Guardian's employees caused the media outlet to prioritise more accurate representations of environmental risk, 'moving away from images such as families enjoying heatwaves at the beach and … polar bears, to images of people around the world affected by – and finding solutions to – climate change'. While this overlap is useful for analytical comparison, The Times' offers further contrast due to the right-leaning political demographic of its audience, while retaining sufficient overlap through its provenance as a broadsheet newspaper.

Once the eleven total images were selected, they were firstly coded by the categorisation suggested by Kress and van Leeuwen (2001). For the purposes of this study, this coding categorisation has been adapted into five sections: image, title and subtitle, caption, (interpersonal) metafunction, and connection with wider socioenvironmental context (refer to Table 2 for the template used to inform the written analysis). In order to systematically analyse each captioned image, three sub-categories were included under Halliday's interpersonal metafunction, which Kress and van Leeuwen describe as the 'interaction between the producers and the viewers of images' (2021, p. 113). These sub-categories are *visual demand*, *intimate distance*, and *front and medium vertical angles*, all of which are used to engender viewer involvement with the image, and with what the image represents.

Image	**Title & Subtitle**	**Caption**	**Interpersonal Metafunction**			**Connection with socioenvironmental context**
			Visual Demand	Intimate Distance	Frontal & Medium Vertical Angles	

Table 2. Meta-Semiotic: Interpersonal Metafunction

Each image was then coded according to Halliday's second meta-semiotic category, the textual metafunction. The composition of an image textually conveys its meanings

through ‘three interrelated systems’, which are *information value*, *framing*, and *salience* (ibid., p. 181). As with the interpersonal metafunction in Table 2, the textual metafunction was sub-categorised into these three interconnected systems, seen in Table 3.

Image	**Title & Subtitle**	**Caption**	**Textual Metafunction**			**Connection with socioenvironmental context**
			Information Value	Framing	Salience	

Table 3. Meta-Semiotic: Textual Metafunction

Finally, both datasets were coded according to Halliday’s ideational metafunction. This offers various ways of ‘expressing active relations between *participants* (represented people, places and things, including abstract things), *processes* (the represented actions of these participants) and *circumstances* (e.g. the place where these actions occur)’ (ibid., p. 45). This triumvirate of participants, processes, and circumstances was used to sub-categorise the ideational metafunction, as seen in Table 4.

Image	**Title & Subtitle**	**Caption**	**Ideational Metafunction**			**Connection with socioenvironmental context**
			Participants	Processes	Circumstances	

Table 4. Meta-Semiotic: Ideational Metafunction

4. Analysis

4.1. Climate Visuals (Dataset 1)

Based on these three tables, each image can be analysed for its interpersonal, textual, and ideational features, starting with the five images from Climate Visuals (2021).

Image 4. Two children on a flooded riverbank in Bhola, Bangladesh (Sazal, 2018)

Interpersonally, Image 4 uses a top-down vertical angle of interaction. This creates an initial impression of vulnerability, reinforced by both of the participants (the children) diverting their gaze from the camera, characteristic of an offer image (Kress and van Leeuwen, 2021, p. 121). In terms of the image's intimate distance, a close-up shot urges the viewer to study the girl's fearful facial expression, encouraging sympathy (Machin and Ledin, 2020, p. 50). Textually, Sazal (2018) foregrounds the girl, creating salience through the sharpness of photographic focus, and a contrast between dull pastel background colours and the strongly saturated redness of her clothing. Ideationally, Image 4 represents a 'reactional process', which occurs 'when the vector is formed by an eyeline' (the gaze of the girl), shifting the image's 'actors' into 'reactors', and the image's 'goals' into 'phenomena' (Kress and van Leeuwen, 2021, p. 62). The participants are passivated, hinting that the large-scale decisions of governments and corporations have rendered their family, village, and region helpless in terms of alleviating the resultant environmental damage. When made with the intent of profit, these governmental and commercial decisions stem from the environmentally-damaging cultural evaluation of capitalistic expansionism.

Through this representation, Sazal (2018) modifies the visual narrative, emphasising the individual human impact of climate change, specifically in relation to SLR. Global warming causes this in two ways; the melting of glaciers and ice sheets, which adds water to the oceans, and the increase in sea temperatures, which expands water volume (Ibrahim et al., 2017). While poorer nations like Suriname, Bahrain, The Marshall Islands, The Maldives, and Bangladesh have been consistently plagued by flooding, media coverage of this ecological phenomenon increased notably in the past year, following the severe floods in western Germany and Eastern Belgium last July, which resulted over two-hundred fatalities

(Kreienkamp et al., 2021, p. 2). The longer it takes for governments and corporations to cut CO_2 emissions, the more extreme these weather events – and their human impact – will become. It is estimated that, along the current trajectory, there could be 150 million climate change refugees by 2050, attributable to environmentally related factors such as deforestation, desertification, unemployment, food and water shortages, SLR, unsustainable agricultural practices, poverty, global warming, and population rise (Ibrahim et al., 2017, p. 148).

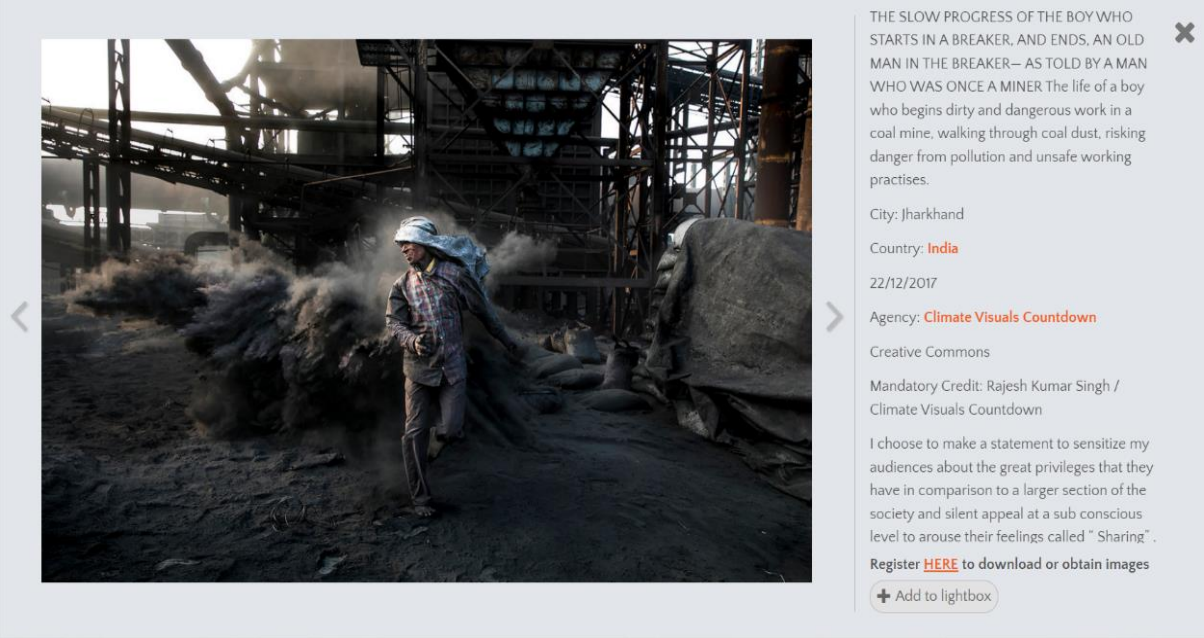

Image 5. A miner walks barefoot through a coal mine in Jharkhand, India (Singh, 2017)

As a 'symbolic suggestive' picture, Image 5 is defined by its central perspective with a frontal angle, by which its sole actor – the coal miner – is simultaneously foregrounded and isolated in his work (Kress and van Leeuwen, 2021, p. 102). Given that the image's vertical axis is at eye level, 'the point of view is one of equality … there is no power difference suggested' (ibid., p. 139), despite hierarchical stereotypes surrounding manual jobs. The monotonous, grimy, and arduous nature of coal mining is reflected in Image 5's lack of colour differentiation, which is unmodulated, and almost entirely monochromatic (ibid., p. 156), demonstrating a harsh working reality caused by continual use of unsustainable fuel sources.

Environmentally, the linguistic naming of a specific location (Jharkhand, Eastern India) instils a sense of urgency and specificity to the impact of climate change (Berglez, 2011). Coal mines all over the world are detrimentally affecting the health of their workers and local ecosystems through soil erosion, the destruction of forests, and dust pollution, a primary cause of respiratory problems (D'Amato et al., 2010). A coal-free deal was a key target at COP26, agreed upon by most nations, until, on the final day of negotiations, India and China insisted on watering down the agreement from 'phase out' to 'phase down' (Hilaire, 2021). China and India were heavily criticised by other nations at COP26, including the UK – despite the government's recent proposal to open a new coal mine in Cumbria (Kythreotis et al., 2021).

Such criticism is largely justified, as this decision will have hugely damaging environmental consequences. However, it must be noted that, as one of world's largest coal exporters, India's economy relies heavily on the coal industry, which directly and indirectly provides work for around four million people (Busby et al., 2021). Most of the coal reserves lie in the Eastern states of Jharkhand**,** Chhattisgarh**,** and Odisha – the so-called coal belt – where coal is the lifeline of the local communities, which are some of India's poorest (Shrimali, 2020). There is great hypocrisy in Western nations demanding that India reduces its carbon emissions by cutting coal production, when – under the cultural evaluations of productionism and consumerism – the West has been polluting the Planet for decades, and reaping the financial rewards (Busby et al., 2021). Furthermore, many of the Indian factories which release carbon dioxide by burning coal do so to produce a range of commodities for exportation to the West, including jewellery, cars, and shoes (Shrimali, 2020). If India and other leading fossil fuel producers are to shift away from coal-fired electricity, the cheaper financial, health, and social costs of renewable alternatives must be promoted and incentivised. By decommissioning brownfield coal plants and replacing them with solar energy plants, India could reap considerable cost advantages, saving around 33.9% in energy costs, 31.57% in fixed costs, according to Shrimali (2020, p. 9). By doing so, India and other countries with the highest fossil fuel production levels could set an example of a pro-environmental and economically stable cultural evaluation for other nations to emulate.

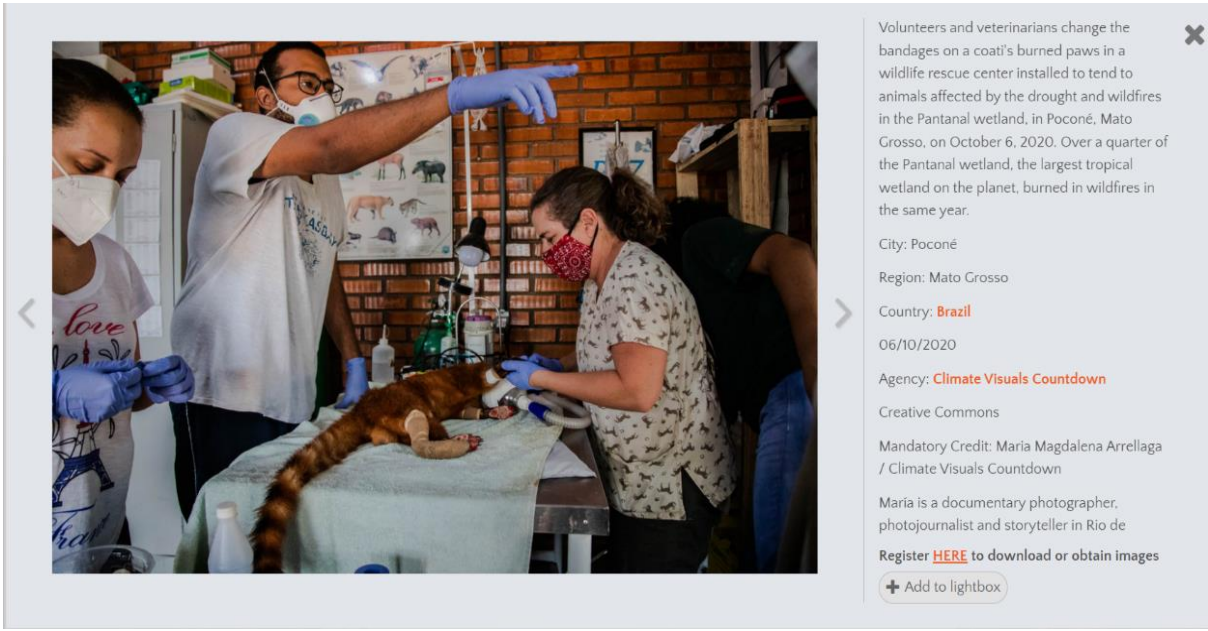

Image 6. Volunteers and veterinarians bandaging a coati's paws after a wildfire in Poconé, Brazil (Arrellaga, 2020)

Images 6 and 7 use various multimodal features to illustrate how human-instigated extreme weather events impact the natural world. Both images are visually composed along the centre-margin, with the wounded animal centralised as the core element, giving it a sense of permanence (Kress and van Leeuwen, 2021, p. 201), contradictory to each animal's perilous condition. In Image 6, Arrellaga (2020) uses a close-up to show a realistic, emotive aspect to the frontline work of these veterinarians, who are represented as actors undertaking dynamic processes – the coati is represented as the goal, toward which the action is directed

(Kress and van Leeuwen, 2021, p. 48). The emblematic irony of this depiction lies in the humans attempting to cure the injured coati, while it was also humans who almost killed it in the first place, as manmade global warming increases the regularity of the dry, hot weather which fuels wildfires (Watts, 2021).

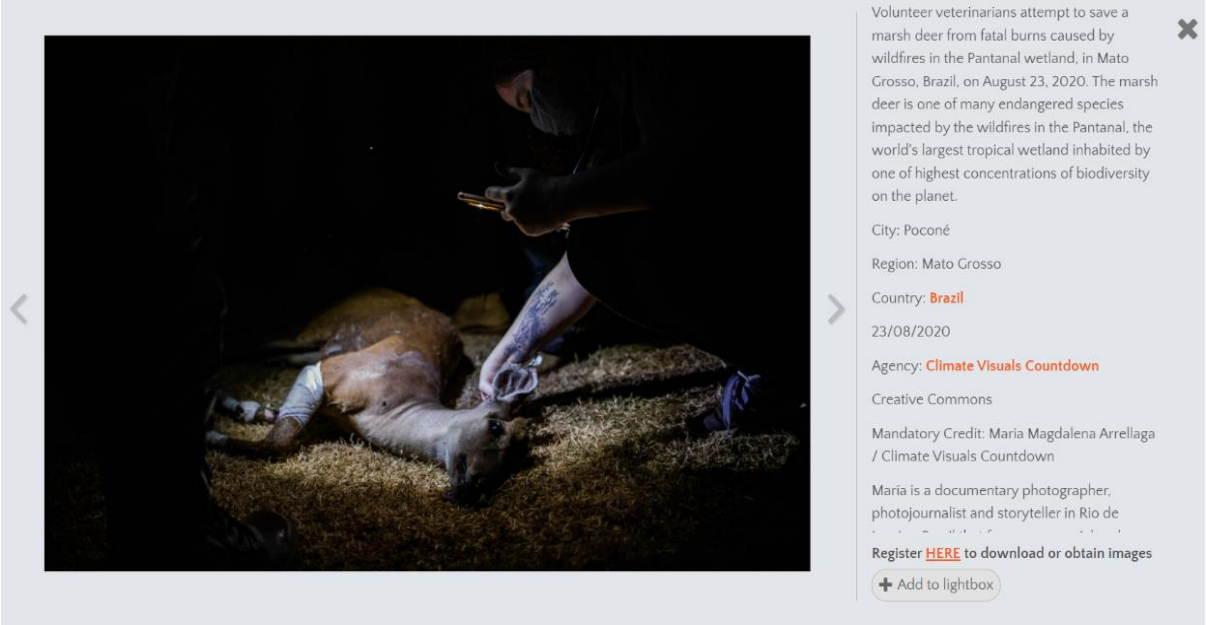

Image 7. A volunteer examining a marsh deer's fatal burns after a wildfire in Poconé, Brazil (Arrellaga, 2020)

While Image 6's colouring is fully modulated, Image 7 has limited modulation, with the marsh deer made salient amid the dark periphery, principally through foregrounding, sharp focus, and illumination (Kress and van Leeuwen, 2021, p. 102). Politically, these images can be used as a reference point to the ecological indifference shown by Jair Bolsonaro, Brazil's nationalist president. Since Bolsonaro took office, deforestation of the Amazon Rainforest has reached its highest levels since 2012, increasing the intensity of temperatures and wildfires in areas across Brazil, including the Pantanal wetland, which has one of the highest concentrations of biodiversity on the Planet (Watts, 2021). At COP26, the Bolsonaro administration made several pledges to improve this, but some have criticised it as vague 'greenwashing' (ibid.). The context of these images can also be extended to encompass the wildfires desolating rural Greece, Turkey, Australia, Italy, Russia, the US, and Canada – the subsequent forest loss and greenhouse gas emissions are likely to accelerate climate change further, possibly leading to a 'reinforcing feedback loop' (Xu et al., 2020, p. 2173). Given that deforestation is largely driven by the economic imperatives of globalised capitalism – in the instance of the Amazon in Brazil, the deforested land is mainly used for meat producers' cattle ranches (Fearnside, 2005, p. 682) – the overarching impact of an anti-environmental cultural evaluation is irrefutable.

Image 8. A group of children and their teacher stood outside a boat school in Faridpur, Bangladesh (Abdullah, 2016)

Image 8 demonstrates the social impact of climate change. As a demand image, it uses a frontal angle to create involvement and capture the viewer's attention (Kress and van Leeuwen, 2021, p. 135). More significantly, Abdullah (2016) uses a long shot, collectivising the schoolchildren, and subtly implying that their situation is being replicated in other areas of the world. Textually, Image 8's information value is composed along the centre-margin, with the children portrayed as the core element with which the other elements are associated (Kress and van Leeuwen, 2021, p. 201). Salience is established through the light saturation of their vibrantly coloured clothing, in contrast with the soft, pastel colours of the land, boat, and water. Such techniques underline the often overlooked injustice of children from poorer nations losing out on their education because of the self-interested commercial decisions of richer nations. They also praise ecologically adaptive initiatives like Shidhulai's floating schools, libraries, and health clinics, which help nearly 97,000 families in flood-prone regions (Abdullah, 2016).

As a collection from a locally-run eco-communications organisation, Dataset 1 illustrates the potential of non-standard, bottom-up photojournalistic outlets. In their depictions of environmental risk, Climate Visuals (2021) prioritise those directly impacted by it, from children in Bangladesh (see Images 4 and 8) to wildlife in Brazil (see Images 6 and 7). By representing real people in natural settings, rather than staged photo opportunities, Dataset 1 offers an alternative path for future environmental photojournalism to tell emotive and authentic stories. This analysis now moves on to Dataset 2, taken from The Guardian's coverage of COP26 (Hilaire, 2021).

4.2. The Guardian (Dataset 2)

Before analysing Dataset 2, it is worth noting that a key point of convergence with Dataset 1 is their shared representation of decontextualised environmental actors (excluding

Image 11), and a key point of divergence is that Dataset 2's representations fall more on the causational end on the aforementioned spectrum of climate change cause and consequence.

Image 9. Alok Sharma, Britain's president for Cop26 (second from right) speaks with other members of his team at the summit (Stansall, 2021)

Image 9 offers a unique insight into the actions of those responsible for mitigating the devastating effects of climate change depicted in Images 4 to 8. Interpersonally, the long shot angle creates distance between the environmental delegates and the viewer (Machin and Ledin, 2020, p. 84). This draws on a common sentiment of politicians not representing those for whom they speak, often seen in climate change protests against policymaking which is driven by environmentally-damaging, profit-oriented cultural evaluations. Nevertheless, Alok Sharma is depicted as an activated participant, engaging his peers and taking the initiative to open dialogue in between the official meetings, indicative of his job of corralling the 196 attending nations at COP26 into agreeing plans to cut greenhouse gas emissions and limit global temperature rise to 1.5°C (Smith et al., 2021; Kythreotis et al., 2021).

Ideationally, while Sharma is the actor of the scenario, there are multiple participants who are 'conjoined' in a bidirectional transactional structure (Kress and van Leeuwen, 2021, p. 51). This participant multiplicity shows how complex the issues under painstaking discussion are, while also emphasising the progress-halting bureaucratic procedures in place at events like COP26. Bureaucratic stalling also exists within organisations like the UN itself, although Stansall (2021) prefers to subtly connect it with naturalism through the inclusion of a spherical image of the Earth, as 'circles and curved forms are associated with the organic' (Kress and van Leeuwen, 2021, p. 52). While this imagery hints at the UN's good intentions, their results obtained at COP26 have been sub-par in terms of preventing the world from reaching dangerous levels of heating, particularly the insufficient pledges of major emitters such as Europe, China, and the US (see Statista, 2021b).

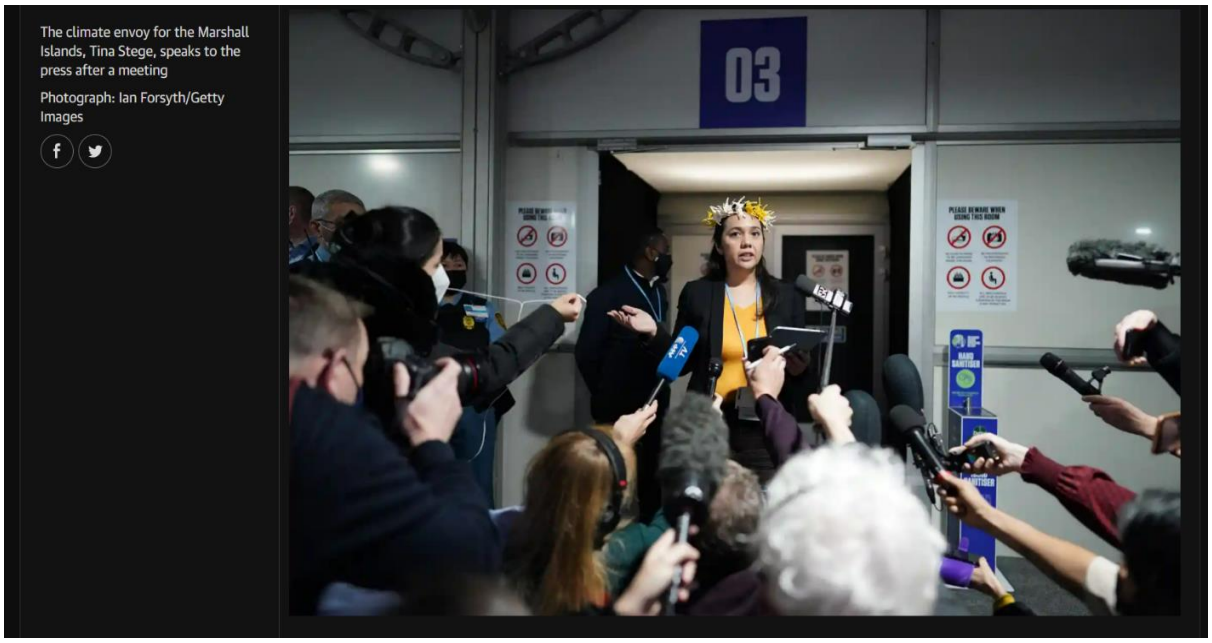

Image 10. The Marshall Islands' climate envoy, Tina Stege, speaking to the press (Forsyth, 2021)

While the overall impact of COP26 may have been more symbolic than practical, it did provide a platform for smaller nations to raise awareness about their environmental predicaments. The involvement created by Image 10's frontal angle (ibid., p. 135) is contradictorily emblematic of the lack of global aid and attention the Marshall Islands has received in response to its status as one of the countries most at risk of disappearing due to SLR (Ibrahim et al., 2017). The journalists' circular orientation around Stege presents her as the image's core element along its centre-margin (Kress and van Leeuwen, 2021, p. 201). Although this suggests a shift in media focus towards the serious impact of flooding on Pacific Island nations, Hansen and Machin (2008, p. 781) would identify it as a marketing opportunity, with large multimedia corporations temporarily capitalising on current trends or social issues to boost readership, before abandoning them for the next popular story – a glaring example of corporate capitalism's cultural influence. If this theory is accurate, other Pacific nations at risk (namely Kiribati, Tokelau, and Tuvalu, referenced in Image 14) cannot rely on media coverage to boost international recognition and assistance for their ecological vulnerability as low-lying coral atolls (Lehman et al., 2019).

Image 11. A displayed mindmap of issues and pledges, produced by the UN Climate Change Conference of Youth (COY) (Worth, 2021)

As the only picture without human participants across all three datasets, Image 11 offers an alternative insight into the inadequate action taken at COP26. With its information value also drawn along the centre-margin, it uses concentric circles to prioritise various climate issues, such as global methane pledges, fossil fuel usage, and a low-carbon future (Kress and van Leeuwen, 2021, p. 201). Given the high connectivity of its spatially composed elements, all of these issues are shown to be interrelated (ibid., p. 206). Its provenance, produced by the UNCOY, reiterates that the youngest generation will suffer most from the adverse impacts of climate change. Within its references to the most crucial topics at COP26, like a US-China join statement, or India and Scotland's promises for a net-zero future (Smith et al., 2021), this provenance is intended to instil a sense of accountability onto those formulating the agreements.

Overall, Dataset 2 tends to associate environmental actors with agency. While its photojournalism focuses on the causational side of climate change, there is nuance within this distinction; Image 10 offers an example of an actor (the climate envoy for the SLR-threatened Marshall Islands) who simultaneously affects, and is affected by, climate change. Image 11 is also deviant, given its non-humanistic features, undercurrents of protest, and that it depicts key issues raised by the UNCOY, who – despite serving under the wing of a larger organisation (the UN) – are permitted some degree of autonomy in their representation of climate concerns. These photojournalistic choices are in-keeping with The Guardian's abovementioned promise of 'holding power to account' (The Guardian, 2021) seen across their wide range of environmentally focused journalism outside of COP26 (Carrington, 2020). This analysis now proceeds to Dataset 3, taken from The Times's coverage of COP26 (Spencer, 2021).

The Times (Dataset 3)

Dataset 3 continues the previously seen decontextualization of its depicted actors. Unlike Dataset 1 (but similarly to Dataset 2), its photojournalism is centred around those involved in reversing climate change, although this is again slanted towards political, rather than corporate, individuals. Accordingly, The Times tends to represent prominent, recognisable public figures such as Greta Thunberg and John Kerry, although there are exceptions.

Climate activist Greta Thunberg spoke during the summit in Glasgow
JANE BARLOW/PA WIRE

Image 12. Stockholm-born environmental activist Greta Thunberg speaking during COP26 (Barlow, 2021)

Image 12 utilises interpersonal and textual features to simultaneously emphasise Greta Thunberg's importance and youthfulness. By forming a vector along the actor's eyeline, the gaze of which is directed off camera, an offer image is established, which may connote Thunberg's vulnerability as an eighteen-year-old activist among world leaders (Kress and van Leeuwen, 2021). However, given the image's direct context, taken as Thunberg delivers a credible speech in front of a sizable and noteworthy audience, Barlow (2021) shows her to be an activated participant in the fight against ecological destruction, regardless of her age. Textually, Thunberg is foregrounded along the centre-margin, and made salient through her bright red jacket amid the dark pastel background (Kress and van Leeuwen, 2021). These techniques denote her integral involvement in the global environmentalism movement: in September 2019, as a part of Thunberg's 'Fridays for Future' initiative, more than 7.6 million people began protesting against governmental inactivity against climate change, including roughly 17,000 students from 24 countries, who took part in a series of Friday school strikes (Fridays For Future, 2021; Kythreotis et al., 2021).

Image 12 and Image 4 also raise a separate issue: the ethicality of using photojournalistic representations of youth to emotionally sway staunch anti-environmental thinkers. Much as environmental narratives repeatedly use low-lying Pacific Islands as concrete examples of climate change (Farbotko, 2010), some claim that depictions of the young people it impacts are underpinned by disingenuous promotional purposes (Hansen and Machin, 2008). In the case of Greta Thunberg, her youthfulness is often drawn on to condemn political and corporate leaders for laissez-faire attitudes to reversing climate change, attributable to profit-oriented cultural evaluations. Notable statements which emphasise how the urgent need to campaign against climate change has ruined her childhood and education include: "I should be back in school" (The Telegraph, 2019, 0:05), and "You have stolen my dreams and my childhood" (ibid., 0:17). There may be some truth to claims that Thunberg has been exploited as a fresh-faced figurehead for climate change activism, but this is disproportionate to the extent that her speeches are vilified in politics and media (Bergmann and Ossewaarde, 2020). As seen by Donald Trump's tweets (Luscombe, 2020), criticism levelled at Thunberg and the environmental movement tends to focus on her as a person – often in the form of ableism, sexism, and ageism (Park et al., 2021) – rather than on her proposals and ideas for combatting climate change.

John Kerry has been a leading voice against climate change
PHIL NOBLE/REUTERS

Image 13. John Kerry, US Special Presidential Envoy for Climate, eating a snack at COP26 (Noble, 2021)

Despite her transnational influence, the media-constructed prestige associated with Thunberg is eclipsed by a figure like John Kerry. Even though Thunberg has grabbed headlines and been made into countless memes (Park et al., 2021), media representations of her are continually distorted to emphasise her inexperience, whereas Kerry tends to be depicted as a stalwart eco-politician. While the belittling representations of Thunberg may be unjust, complimentary portrayals of Kerry are largely deserved, due to his role as a veteran in

the fight against climate change, above all cementing the 2015 Paris Agreement in his role as Barack Obama's US Secretary of State, which made emissions-reduction pledges a legal requirement for member countries (United Nations, 2015).

At its surface level, Image 13 does not substantiate this complimentary description. Noble (2021) opts to photographically capture Kerry whilst eating – rather than delivering a speech, or hosting a meeting – which could be interpreted as an attempt to dilute his esteemed reputation. The salience of the food item he eats (a crisp) reinforces this, given its connotations as highly processed and unsustainable. However, this interpretation seems unlikely on closer examination of Image 13's interpersonal, textual, and ideational features. Kerry is made salient through foregrounding and sharp focus, implicitly connoting his power and influence, reinforced by the visual demand formed through direct eye contact (Kress and van Leeuwen, 2021, p. 102). Moreover, Kerry is represented as the core element with which the other elements of the photograph are associated (ibid., p. 201), creating an impression of permanence.

This is perhaps reflective of his extensive history of eco-political engagement; in Kerry's near-thirty years as US Senator, he has almost unwaveringly voted pro-environment (LCV, 2020), even attending the first Rio Earth summit in 1992 (Goldenberg, 2013), before most politicians got wise to the possibility of exploiting climate agendas and green policies for personal clout. Kerry has also been vocal in calling on the world's twenty most polluting nations – which produce 81% of global carbon emissions – to reduce their CO2 immediately (Harrabin, 2021). In this light, Noble's (2021) photojournalistic choices may intend to humanise and normalise Kerry, juxtaposing his seemingly grandiose environmental feats with the everyday act of eating a crisp.

Tuvalu's Simon Kofe gave a Cop26 statement while standing in the ocean
TUVALU FOREIGN MINISTRY/REUTERS

Image 14. Simon Kofe, Tuvalu's Minister for Justice, Communication, and Foreign Affairs, stands in the ocean as he gives a COP26 statement (Tuvalu Foreign Ministry, 2021)

As mentioned in the analysis of Image 10, the increased media attention on environmental issues during COP26 afforded smaller Pacific nations a platform to shed light on their climate change-related issues, albeit as a predominantly symbolic gesture. Interpersonally, Image 14 is a quasi-demand image, with Kofe's eyeline directed just to the side of the camera (Kress and van Leeuwen, 2021, p. 135). As with Image 10, a frontal angle is used to encourage viewer involvement (ibid.), drawing attention to the lack of public awareness of the dire threat posed by SLR for countries like Tuvalu or the Marshall Islands (Farbotko, 2010; Ibrahim et al., 2017). Tuvalu's autonomy is connoted by the salience of its flag – representative of Tuvalu's culture, history, language, and people – which is foregrounded and saturated, with the bright blue colouring contrasted with the soft pastel colours of the water, concrete, and rocks in the backdrop (Kress and van Leeuwen, 2021, p. 156). The UN flag (left) is also foregrounded, indicating the organisation's international significance in unifying countries around the common goal of reversing climate change, with fluctuating effectiveness.

Kofe is the undisputed main actor of the scene, conjoined by his unnamed compatriot or colleague in a bidirectional reactional process (Kress and van Leeuwen, 2021, p. 51). However, unlike Image 10, this process occurs out of camera shot – the viewer can deduce the presence of onlookers required for bidirectionality, journalists in this case, even if they are not depicted (ibid., p. 63). While environmental media reporting has drawn heavily on the "drowning island narrative" (Farbotko and Lazrus, 2012), public understanding of the effect or erosion and inundation islands, particularly in terms of human migration, is limited. For instance, it is not commonly known that the sea level near Tuvalu has risen by roughly 5mm per year since 1993, much larger than the global average of 2.8–3.6mm per year (International Climate Change Adaptation Initiative, 2011, p. 4).

Taking this into account, the light-hearted facial expressions displayed by both men in Image 14, while contradictory of the severity of Tuvalu's situation, seem not naïve, but admirably optimistic. Kofe's compatriot adds to this by making the 'victory' sign with his right hand, exuding positivity and enthusiasm. A humanitarian side to political speeches and diplomacy is shown, emphasising the personalised impact of climate change should SLR overwhelm the shorelines of Pacific nations like Tuvalu, The Marshall Islands, Kiribati, or Vanuatu (Farbotko and Lazrus, 2012). Comprehensive reports on SLR's global impact demonstrate that this is not limited to low lying Pacific atolls (Dasgupta et al., 2007). By evaluating the hypothetical effect of SLR ranging from one metre to five metres by separate categories per country (land area, population, GDP, urban extent, agricultural extent, and wetlands), Dasgupta et al. (2007) pinpointed the most at-risk developing nations by geographic region: Latin American and Caribbean nations include The Bahamas, Cuba, Belize, Puerto Rico, Guyana, Nicaragua, Jamaica, and Suriname (ibid., p. 13); North African and Middle Eastern nations include Egypt, UAE, Libya, Tunisia, Qatar, and Saudi Arabia (ibid., p. 19); Sub-Saharan African nations include The Gambia, Guinea-Bissau, Senegal, Sierra Leone, Mozambique, Mauritania, and Benin (ibid., p. 24); East Asian nations include

Vietnam, Taiwan, Myanmar, Indonesia, Thailand, Cambodia, or The Philippines (ibid., p. 31); and South Asian nations include Bangladesh, Sri Lanka, Pakistan, The Maldives, and India (ibid., p. 36). Photojournalistic representations like Image 14 serve as a point of foundational understanding and awareness of ecological phenomena like SLR, upon which the viewer can build a deeper knowledge of its intercontinental threat, and of the damaging cultural evaluations underpinning it.

In sum, images from all three datasets depict decontextualised actors who fall along a spectrum of environmental risk. This ranges from those directly impacted by climate change (both humans and animals, predominantly in Dataset 1), to those responsible for reversing climate change (typically in Datasets 2 and 3, see Images 9, 10, 13, and 14), to those protesting against the inefficacy of current climate change action (also in Datasets 2 and 3, see Images 11 and 12).

5. Discussion & Recommendations

The above analysis of Climate Visuals', The Guardian's, and The Times' photojournalism has gleaned valuable insights into the multimodal resources used by traditional and non-traditional UK media outlets in representing climate change and COP26. Using Social Semiotics as its theoretical background and Multimodality as its analytical framework, this paper has demonstrated that political accountability around climate change – and, to an even greater extent, corporate accountability, as there is no commercial equivalent to COP26 – is lacking. For these environmental power asymmetries to be addressed, far more serious legislative action is required for nations (and companies) with the biggest impact on climate change to follow through on their pledges (Godfrey, 2012). It is essential that the countries emitting the highest levels of CO_2 – which include China, the US, India, Russia, and Japan (Statista, 2021b) – set the precedent for the rest of the world to follow in terms of climate policies and regulations.

Based on this analysis, critical recommendations for future depictions of climate change and eco-political action can be made. In order to integrate a cultural evaluation of pro-environmentalism moving forward (Stibbe, 2020), it is essential that research and publications about urgent ecological issues receive global exposure. To some extent, this is already happening (Carrington, 2020), but environmental photojournalism has to become even more prominent to maintain high levels of public scrutiny surrounding climate change policies, not only during notable events like COP26, but year-round.

Regarding the specifics of these representations, increased photojournalistic exposure to the localised, human impact of climate change, and more accessible coverage of everyday solutions will be crucial (Berglez, 2011). Care must also be taken to avoid catastrophising a 'drowning island' narrative (Farbotko and Lazrus, 2012), or perpetuating 'eco-colonialism', by which representations of climate change, often of Pacific Islands, are used to 'concretize climate science's statistical abstractions', denying island people their own agency in the

environmental crisis (Farbotko, 2010, p. 58). This catastrophisation can relate to the citizens of any area in the world affected by climate change.

Ahead of COP27, due to be held in Sharm El-Sheik, Egypt, in November 2022, more attention must be placed on photojournalistic representations of climate conferences, and of climate change itself. Newspapers of all political orientations should neither glorify nor vilify individual environmental figures, whether it be Alok Sharma, Bhupender Yadav, or Greta Thunberg, instead prioritising the bigger picture of what is actually agreed and acted upon. In line with Climate Visuals' (2021) principles, journalistic representations of climate change ought to show how it impacts the lives of real, everyday people, using emotionally powerful imagery to stimulate climate conversations across society. For conference planners, making this realistic photojournalism as visible as possible at COP27 is essential to convey the urgency of the climate crisis to attending policymakers and delegates. Greater access to this sort of photojournalism should also be provided to the general public through social media and newspapers, as well as physical copies where possible, located, for instance, in workplaces, schools, and other public buildings.

6. Conclusion & Further Research

Through an analysis of multimodal climate imagery and news coverage, this study has highlighted connections, discrepancies, and inequalities between the causes of environmental damage and its devastating consequences. In terms of future research, Schäfer and Schlichting's (2014) meta-analysis of publications in the field of climate change media representations found that studies of European (39.4%) and North American (28.1%) countries' media coverage of climate change received the most scholarly attention (p. 150, Table 2). It also found that more than two-thirds of all analysed media (67.5%) are print media (ibid., p. 151, Table 3). Therefore, further research in this field might examine representations of climate change from journalistic sources from non-Anglospheric media outlets, of a different political orientation, of a different format (such as tabloid rather than broadsheet newspapers), or from other multimodal formats, such as television or social media.

Overall, this paper concludes that emotive, realistic photojournalism has the potential to enhance public understanding of the devastating impact of climate change – on both a human and natural level – and to increase public scrutiny towards climate change policy and legislation. By referring back to the modern, eco-semiotic concept of cultural evaluations (Stibbe, 2020), and its not-so-modern, structuralist counterpart of naturalisation (Barthes, 1972), narratives which have contributed towards environmental destruction, rather than conservation, can be debunked, such as expansionism, consumerism, and corporate capitalism. It is a poignant irony that the 'naturalisation' of these damaging cultural evaluations continues to ruin much of the natural world, despite the wealth of data, research, and information available on how to reverse the situation. Moving forward, photojournalistic outlets have the capacity to propagate pro-environmentalism as a new cultural evaluation, and to play a vital if understated role in overcoming humankind's greatest threat to date.

Bibliography

Abdullah, A. (2016) *Boat school in Bangladesh*. Available at: https://climatevisuals.org/groupitem/95/ (Accessed: 18 November 2021).

Anderson, A. (2013) *Media, culture and the environment*. London: Routledge.

Appelgren, E. & Jönsson, A. M. (2021) 'Engaging Citizens for Climate Change – Challenges for Journalism', *Digital Journalism*, 9(6), pp. 755–772.

Arrellaga, M. M. (2020) *Wildfires in the Brazilian Pantanal*. Available at: https://climatevisuals.org/groupitem/95/ (Accessed: 17 November 2021).

Barlow, J. (2021) *Climate activist Greta Thunberg spoke during the summit in Glasgow.* Available at: https://www.thetimes.co.uk/article/40-000-attendees-15-days-but-was-it-all-a-waste-of-time-n0lvv3ql2 (Accessed: 3 February 2022).

Barthes, R. (1972) *Mythologies*. New York: Hill and Wang.

Bateman, J., Delin, J. & Henschel, R. (2007) 'Mapping the multimodal genres of traditional and electronic newspapers, in Royce, T. & Bowcher, W. (eds.) *New Directions in the Analysis of Multimodal Discourse.* New Jersey: Lawrence Erlbaum Associates.

Bateman, J., Wildfeuer, J. & Hiippala, T. (2017) *Multimodality: Foundations, Research, and Analysis – A Problem-Oriented Introduction.* Berlin: De Gruyter.

Berglez, P. (2011) 'Inside, outside, and beyond media logic: journalistic creativity in climate reporting', *Media, Culture & Society*, 33(3), pp. 449–465.

Bergmann, Z. & Ossewaarde, R. (2020) 'Youth climate activists meet environmental governance: Ageist depictions of the FFF movement and Greta Thunberg in German newspaper coverage', *Journal of Multicultural Discourses*, 15(3), pp. 267–290.

Busby, J. W., Shidore, S., Urpelainen, J. & Bazilian, M. D. (2021) 'The case for US co-operation with India on a just transition away from coal', *Brookings*, 20 April. Available at: https://www.brookings.edu/research/the-case-for-us-cooperation-with-india-on-a-just-transition-away-from-coal/ (Accessed: 17 February 2022).

Carrington, D. (2020) '3,000 articles, 100m readers: a year of our best environment journalism', *The Guardian*, 5 October. Available at: https://www.theguardian.com/environment/2020/oct/05/3000-articles-100m-readers-a-year-of-our-best-environment-journalism (Accessed: 25 February 2022).

Carvalho, A. (2005) 'Representing the politics of the greenhouse effect: Discursive strategies in the British media', *Critical Discourse Studies*, 2(1), pp. 1–29.

Climate Outreach (2021) *ABOUT US – Our story & values*. Available at: https://climateoutreach.org/about-us/story-values/ (Accessed: 15 November 2021).

Climate Visuals (2021) *COLLECTIONS – Visualising Climate Change*. Available at: https://climatevisuals.org/groupitem/95/ (Accessed: 16 November 2021).

D'Amato, G., Cecchi, L., D'amato, M. & Liccardi, G. (2010) 'Urban air pollution and climate change as environmental risk factors of respiratory allergy: an update', *Journal of Investigational Allergology and Clinical Immunology*, 20(2), pp. 95–102.

Dasgupta, S., Laplante, B., Meisner, C., Wheeler, D. & Yan, J. (2007) *The impact of sea level rise on developing countries: a comparative analysis*. Available at: https://openknowledge.worldbank.org/bitstream/handle/10986/7174/wps4136.pdf (Accessed: 15 February 2022).

De Pascale, F. & Dattilo, V. (2020) 'The Geoethical Semiosis of the Anthropocene: The Peircean Triad for a Reconceptualization of the Relationship between Human Beings and Environment', *Annals of the American Association of Geographers*, 111(3), pp. 647–654.

Farbotko, C. (2010) 'Wishful sinking: Disappearing islands, climate refugees and cosmopolitan experimentation', *Asia Pacific Viewpoint*, 51(1), pp. 47–60.

Farbotko, C. & Lazrus, H. (2012) 'The first climate refugees? Contesting global narratives of climate change in Tuvalu', *Global Environmental Change*, 22(2), pp. 382–390.

Fearnside, P. M. (2005) 'Deforestation in Brazilian Amazonia: history, rates, and consequences', *Conservation Biology*, 19(3), pp. 680–688.

Forsyth, I. (2021) *The Marshall Islands' climate envoy press conference*. Available at: https://www.theguardian.com/environment/gallery/2021/nov/13/cop26-goes-into-overtime-in-pictures (Accessed: 24 November 2021).

Fridays For Future (2021) *What We Do – Strike Statistics*. Available at: https://fridaysforfuture.org/what-we-do/strike-statistics/ (Accessed: 10 February 2022).

Godfrey, R. (2012) 'The Political Aspects of Environmentalism in the UK', *Institute of Environmental Science*, 4(1), pp. 1–10.

Goldenberg, S. (2013) 'John Kerry's confirmation as secretary of state delights climate campaigners', *The Guardian*, 29 January. Available at: https://www.theguardian.com/environment/2013/jan/29/john-kerry-secretary-of-state-climate-change (Accessed: 11 February 2022).

Hansen, A. & Machin, D. (2008) 'Visually branding the environment: climate change as a marketing opportunity', *Discourse Studies*, 10(6), pp. 777–794.

Halliday, M. A. K. & Matthiessen, C. M. (2014) *An Introduction to Functional Grammar*. (3rd edn.). Abingdon: Routledge.

Harrabin, R. (2021) 'Climate change: Kerry urges top polluters to cut emissions now', *BBC News*, 8 March. Available at: https://www.bbc.co.uk/news/uk-politics-56321456 (Accessed: 10 February 2022).

Harari, Y.N. (2014) *Sapiens: A Brief History of Humankind.* London: Penguin Random House.

Hilaire, E. (2021) ‘Cop26 goes into overtime – in pictures’, *The Guardian*, 13 November. Available at: https://www.theguardian.com/environment/gallery/2021/nov/13/cop26-goes-into-overtime-in-pictures (Accessed: 18 November 2021).

Hodge, R. & Kress, G. (1988) *Social Semiotics*. New York: Cornell University Press.

Holbert, R. L., Kwak, N. & Shah, D.V. (2003) ‘Environmental concern, patterns of television viewing, and pro-environmental behaviors: Integrating models of media consumption and effects’, *Journal of Broadcasting & Electronic Media*, 47(2), pp. 177–196.

Ibrahim, I., Isabela, B. Valduga, B., Garcia, J., Baltazar, J., Osoriode, S. & Guerra, A. (2017) ‘Climate change and forced migrations: An effort towards recognizing climate refugees’, *Geoforum*, 84(1), pp. 147–150.

International Panel on Climate Change (2018) ‘Summary for Policymakers’, in Masson-Delmotte, V., Zhai, P., Pörtner, H. O., Roberts, D., Skea, J., Shukla, P. R., Pirani, A., Moufouma-Okia, W., Péan, C., Pidcock, R., Connors, S., Matthews, J. B. R., Chen, Y., Zhou, X., Gomis, M. I., Lonnoy, E., Maycock, T., Tignor, M., & Waterfield, T. (eds.) *Global Warming of 1.5°C: An IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty*. In Press.

International Climate Change Adaptation Initiative (2011) *Pacific Climate Change Science Program: Current and Future Climate of Tuvalu*. Available at: https://world.350.org/pacific/files/2014/01/4_PCCSP_Tuvalu_8pp.pdf (Accessed: 15 February 2022).

Jewitt, C. & Henriksen, B. (2016) ‘Social Semiotic Multimodality’, in Klug, N. M. & Stöckl, H. (eds.) *Handbuch Sprache im multimodalen Kontext (Handbook of Language in Multimodal Contexts)*. Berlin: Mouton De Gruyter.

Kingsnorth, P. & Hine, D. (2009) *The Dark Mountain Project manifesto [online]*. Available at: http://dark-mountain.net/about/manifesto/ (Accessed: 25 February 2022).

Korten, D. (2006) *The Great Turning: From Empire to Earth Community*. San Francisco: Berrett-Koehler.

Kreienkamp, F., Philip, S.Y., Tradowsky, J.S., Kew, S.F., Lorenz, P., Arrighi, J., Belleflamme, A., Bettmann, T., Caluwaerts, S., Chan, S.C., Ciavarella, A., De Cruz, L., de Vries, H., Demuth, N., Ferrone, A., Fischer, E. M., Fowler, H. J., Goergen, K., Heinrich, D., Henrichs, Y., Lenderink, G., Kaspar, F., Nilson, E., Otto, F. E. L., Ragone, F., Seneviratne, S. I., Singh, R. K., Skålevåg, A., Termonia, P., Thalheimer, L., van Aalst, M., Van den Bergh, J., Van de Vyver, H., Vannitsem, S., van Oldenborgh, G. J., van Schaeybroeck, B., Vautard, R., Vonk, D. & Wanders, N. (2021) *Rapid attribution of heavy rainfall events leading to the severe flooding in Western Europe during July 2021*. Available at: https://biblio.ugent.be/publication/8732135/file/8732138 (Accessed: 16 February 2022).

Kress, G. & van Leeuwen, T. (2001) *Multimodal discourse: The modes and media of contemporary communication.* London: Arnold.

Kress, G. & van Leeuwen, T. (2021) *Reading Images: The Grammar of Visual Design*. London: Routledge.

Kythreotis, A. P., Howarth, C., Mercer, T. G., Awcock, H. & Jonas, A. E. G. (2021) 'Re-evaluating the changing geographies of climate activism and the state in the post-climate emergency era in the build-up to COP26', *Journal of the British Academy*, 9(5), pp. 69–93.

LCV (2020) *National Environmental Scorecard – Senator John Kerry (D).* Available at: https://scorecard.lcv.org/moc/john-kerry (Accessed: 11 November 2022).

Lehman, B., Thompson, J., Davis, S. & Carlson, J. M. (2019) 'Affective Images of Climate Change', *Frontiers in Psychology*, 10(960), pp. 1–10.

Luscombe, R. (2020) '"Chill!": Greta Thunberg recycles Trump's mockery of her as he tries to stop votes', *The Guardian*, 5 November. Available at: https://www.theguardian.com/environment/2020/nov/05/greta-thunberg-donald-trump-twitter-chill (Accessed: 10 February 2022).

Machin, D. & Ledin, P. (2020) *Introduction to Multimodal Analysis*. London: Bloomsbury Arnold.

Maran, T. & Kull, K. (2014) 'Ecosemiotics: main principles and current developments', *Geografiska Annaler: Series B, Human Geography*, 96(1), pp. 41–50.

Noble, P. (2021) *John Kerry has been a leading voice against climate change*. Available at: https://www.thetimes.co.uk/article/40-000-attendees-15-days-but-was-it-all-a-waste-of-time-n0lvv3ql2 (Accessed: 3 February 2022).

Norton, C. & Hulme, M. (2019) 'Telling one story, or many? An ecolinguistic analysis of climate change stories in UK national newspaper editorials', *Geoforum*, 104(1), pp. 114–136.

Olausson, U. (2011) '"We're the Ones to Blame": Citizens' Representations of Climate Change and the Role of the Media', *Environmental Communication*, 5(3), pp. 281–299.

Park, C.S., Liu, Q. & Kaye, B.K. (2021) 'Analysis of Ageism, Sexism, and Ableism in User Comments on YouTube Videos About Climate Activist Greta Thunberg', *Social Media & Society, 7*(3), pp. 1–14.

Sampei, Y. & Aoyagi-Usui, M. (2009) 'Mass-media coverage, its influence on public awareness of climate-change issues, and implications for Japan's national campaign to reduce greenhouse gas emissions', *Global Environmental Change*, 19(2), pp. 203–212.

Sazal, M. (2018) *Surviving against climate tragedy, two children, a girl and a boy, on a flooded riverbank.* Available at: https://climatevisuals.org/groupitem/95/ (Accessed: 16 November 2021).

Schäfer, M. S. & Schlichting, I. (2014) 'Media Representations of Climate Change: A Meta-Analysis of the Research Field', *Environmental Communication*, 8(2), pp. 142–160.

Shrimali, G. (2020) 'Making India's power system clean: retirement of expensive coal plants', *Energy Policy*, 139(4), pp. 1–10.

Singh, R. K. (2017) *Black Lungs*. Available at: https://climatevisuals.org/groupitem/95/ (Accessed: 16 November 2021).

Smith, P., Beaumont, L., Bernacchi, C. J., Byrne, M., Cheung, W., Conant, R. T., Cotrufo, F., Feng, X., Janssens, I., Jones, H. & Kirschbaum, M. U. (2021) 'Essential outcomes for COP26', *Global Change Biology*, 28(1), pp. 1–3.

Spencer, B. (2021) '40,000 attendees, 15 days — but was it all a waste of time?', *The Times*, 14 November. Available at: https://www.thetimes.co.uk/article/40-000-attendees-15-days-but-was-it-all-a-waste-of-time-n0lvv3ql2 (Accessed: 3 February 2022).

Stamm, K. R., Clark, F. & Eblacas, P. R. (2000) 'Mass communication and public understanding of environmental problems: the case of global warming', *Public Understanding of Science*, 9(3), pp. 219–237.

Stansall, B. (2021) *Delegates at COP26*. Available at: https://www.theguardian.com/environment/gallery/2021/nov/13/cop26-goes-into-overtime-in-pictures (Accessed: 24 November 2021).

Statista (2021a) *Monthly reach of leading newspapers in the United Kingdom from April 2019 to March 2020.* Available at: https://www.statista.com/statistics/246077/reach-of-selected-national-newspapers-in-the-uk/ (Accessed: 11 November 2021).

Statista (2021b) *Distribution of fossil fuel CO2 emissions worldwide in 2020, by select country.* Available at: https://www.statista.com/statistics/271748/the-largest-emitters-of-co2-in-the-world/ (Accessed: 4 December 2021).

Stibbe, A. (2020) *Ecolinguistics: Language, ecology, and the stories we live by.* (2nd edn.). Abingdon: Routledge.

The Guardian (2021) *About Us*. Available at: https://www.theguardian.com/about (Accessed: 13 November 2021).

The Telegraph (2019) *Emotional Greta Thunberg attacks world leaders: "How dare you?".* Available at: https://www.youtube.com/watch?v=xVlRompc1yE (Accessed: 10 February 2022).

Tuvalu Foreign Ministry (2021) *Tuvalu's Simon Kofe gave a Cop26 statement while standing in the ocean.* Available at: https://www.thetimes.co.uk/article/40-000-attendees-15-days-but-was-it-all-a-waste-of-time-n0lvv3ql2 (Accessed: 3 February 2022).

United Nations Framework Convention on Climate Change (2010) *Cancún Climate Change Conference – November 2010*. Available at: https://unfccc.int/process-and-meetings/conferences/past-conferences/cancun-climate-change-conference-november-2010/cancun-climate-change-conference-november-2010-0 (Accessed: 12 February 2022).

United Nations (2015) *Paris Agreement*. Available at: https://unfccc.int/sites/default/files/english_paris_agreement.pdf (Accessed: 11 February 2022).

United Nations (2021) *The Climate Crisis – A Race We Can Win*. Available at: https://www.un.org/en/un75/climate-crisis-race-we-can-win (Accessed: 6 November 2021).

Watts, J. (2021) 'Do not trust Brazil's 'greenwashing' promises, say Amazon activists', *The Guardian*, 1 November. Available at: https://www.theguardian.com/environment/2021/nov/01/do-not-trust-brazils-greenwashing-promises-say-amazon-activists (Accessed: 24 November 2021).

Worth, K. (2021) *COP26 Mindmap*. Available at: https://www.theguardian.com/environment/gallery/2021/nov/13/cop26-goes-into-overtime-in-pictures (Accessed: 24 November 2021).

Xu, R., Yu, P., Abramson, M.J., Johnston, F. H., Samet, J. M., Bell, M. L., Haines, A., Ebi, K. L., Li, S. & Guo, Y. (2020) 'Wildfires, global climate change, and human health', *New England Journal of Medicine*, 383(22), pp. 2173–2181.