

The eco-documentary and environmental history: possible and desirable encounters and compromises.

**Thoughts based on the film
*Ozone Hole: How We Saved the Planet.***

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Ozone Hole, Jamie Lockhead, 2018 © Windfall Films - Amazon prime video

A new (sub-)genre has emerged in the field of documentary films since the mid-2000s namely the eco-documentary. The makers of these films generally present their approach as both an analysis of political responses to environmental problems and an attempt to raise citizens' awareness to incite them to take action. To achieve this dual purpose, they combine "a rhetoric of facts and documented reality" with "narrative and visual strategies that add emotion and identification to the viewer experience". [\[1\]](#) However, some of the narrative and image-based choices are problematic for me as a historian. Above all, I question both the effectiveness of current eco-documentaries in inciting people to take action and the nature of change they encourage.

[Ozone Hole: How We Saved the Planet](#) (2018) [2] tells the story of the construction of international governance regarding the anthropogenic destruction of the ozone layer in the 1980s. Watching this film reactivated my desire to formulate my thoughts on eco-documentaries. The critical review that I shall develop here has three intentions. These are firstly to show that the narrative choices of eco-documentary filmmakers are frequently in conflict with historians' methods and are actually not particularly compatible with the objective of inciting viewers to take political action; secondly to note with regret the very limited use of audiovisual archives in the field of environmental history; and finally to build bridges between eco-documentary filmmakers and historians. [3]

There are two stages to my argument. In the first three parts, I shall analyse the construction of the narrative in the eco-documentary. Then in the last two parts, I study the place and use of scientific and artistic images and audiovisual archives in the eco-documentary and in environmental history.

A providential individual, the irony of history, psychologisation: narrative effects that depoliticise matters

To use the classification suggested by Ib Bondebjerg in this issue of *Traverses*, [Ozone Hole: How We Saved the Planet](#) is in the category of "authoritative eco-documentaries" (films whose aim is to have scientific authority). [4] The film gives a central place to scientists and scientific experts who are portrayed as being opinion makers, negotiators in arenas of governance and/or personalities who are capable of influencing political leaders publicly or in private. They are described as having objective, and therefore, authoritative knowledge which is contrasted with other forms of knowledge like amateur knowledge (which is however uncommon in the area of stratospheric ozone depletion), political communication and propaganda, or industry's media and advertising activities. However, scientific specialists are obviously not the only people involved in the construction of environmental policies and are not necessarily even central to the narratives of such "authoritative eco-documentaries". One example of this is that [Jamie Lochhead](#), the English writer and director of [Ozone Hole: How We Saved the Planet](#), preferred to give a central role in his film to two heads of state - Ronald Reagan and Margaret Thatcher. [5]

Trailer of *The Hole: How Ronnie and Maggie saved the world*

Let's take the short five-minute film mentioned above as our starting point. [Lochhead](#) used footage from his documentary for its trailer *The Hole: How Ronnie and Maggie saved the world* [6] to summarise the story and thus give the main documentary internet visibility. As in the feature film, 'Maggie' Thatcher and 'Ronnie' Reagan are at the heart of the story in the trailer. They are more or less depicted as pilgrims, who attempt to convince their foreign counterparts to "save

the world" (the expression chosen in the title). But while Thatcher and Reagan were powerful actors indeed in international diplomacy, it would also be a gross misrepresentation to present them as key players in ozone diplomacy.

Firstly, their roles as leaders did not involve them spending more than a few hours at most in negotiations. Secondly, their decisions were obviously shaped by the power relations driven by their national public opinion and administration. [Lochhead](#) points out that scientific elites and 'consumerists' put Reagan under a certain amount of domestic pressure which was all the more decisive because certain conservative members of his administration were refusing progress. [7] However, he does not mention the pressure on Thatcher exerted by leading British ozone scientists (the hole in the ozone layer over Antarctica was first documented by British scientists in 1985), her Environment Secretary, the House of Lords and British environmental groups. This combined pressure played a key role in the Iron Lady finally agreeing to sign the Montreal Protocol in September 1987 and then taking on the mantle of eloquent spokeswoman in international discussions to plead the cause of the ozone layer with other Western countries and advocate financial compensation for developing countries.

In fact, the documentary only focuses on Thatcher's 'green period' which lasted for two years at most. This was from late 1987 to late 1989, when long-range transboundary air pollution (acid rain) and threats of ozone depletion and global warming were making headlines, and the Green Party's were becoming increasingly popular with British voters (the Green Party UK obtained a historic 15% in the June 1989 European elections). However, [Lochhead](#) does not mention the fact that the British Prime Minister had opposed signing a binding treaty on ozone-depleting substances (chlorofluorocarbons (CFCs), halons, tetrachloromethane, hydrobromofluorocarbons, etc.) until the final months of the Montreal Protocol negotiations. In this respect she fully went along with the views of the British chemical industry and negotiators from Western and Southern European countries and Japan. [8] Indeed she was to actually oppose ambitious climate change policies after her resignation in 1990.

The choice of actors to be central to the narrative is political in nature as is the description of the factors that lead them to act. Three narrative effects seem to me to be particularly problematic as they tend to depoliticise events and/or discourage viewers. Firstly, [Lochhead](#) chose two political stars for his film in Thatcher and Reagan. The choice of famous individuals (or making lesser-known figures into stars or heroes) is a recurrent feature of productions aimed at the general public and documentaries are no exception. Observational eco-documentaries - like the film [Demain](#) (2015) - escape this to an extent by focusing on everyday local practices but authoritative eco-documentaries often chose actors the general public knows to achieve a phenomenon of

identification. [9] Such choices become very problematic when people are given a central narrative role on the pretext that they are famous and this is even worse when they are presented as providential individuals. Unfortunately, this is the case with [Ozone Hole: How We Saved the Planet](#) where viewers are consequently largely reduced to just being spectators of politics - or more precisely, spectators of 'an incarnation of politics centred on the most influent policy-makers'.

Secondly, Reagan and Thatcher were clearly also chosen because of their proverbial anti-environmentalism and the antipathy they provoked among environmentalists. They may not have been placed at the centre of the narrative just to please a right-wing audience seeking to assuage their environmental conscience (in fact this is actually quite likely...) but they were obviously made the subject of the film for comedic purposes! By some trick or irony of history, Reagan and Thatcher "have become the most unlikely ecowarriors in history" as [Lochhead](#) jokes. [10] And yet what responsibility is left when history is a farce?

Thirdly, documentary filmmakers frequently use biographical elements to make the identification process work. This is a familiar technique - that of storytelling which consists of interweaving individual and collective narratives and combining a personal story with broader elements of history. However, this involves many dangers including the psychologisation of the action. [Lochhead](#) succumbs to this when he explains that Reagan was sensitive to the ozone layer problem because he enjoyed spending long hours in the sun on his Californian ranch which had led to him undergoing surgery on his nose for a skin cancer. This illness was the most feared consequence of ozone depletion. This may indeed have played a role in Reagan's understanding of the problem and indeed all decision-making results from a trade-off between multiple 'instincts'. However, the psychological elements which are evoked cannot be presented as the most important factors in a president's decision-making. [11] Moreover, and above all, the central narrative position assigned to these highly idiosyncratic and accidental elements relegates ideological positions and political commitment to a less important position.

Above and beyond world leaders' discourse, multiple actors construct long-term dynamics

The lines suddenly shifted between the summers of 1986 and 1987, creating favourable conditions for all the major polluting countries to sign the Montreal Protocol. Close observation of this moment reveals the lasting action of people involved who clearly played a more decisive role than the heads of state.

Firstly, influential individuals and institutions with varied profiles that are sometimes close to the highest decision-making bodies jointly promote a rapid, demanding and coordinated response on the global scale. This involves the differentiated (between industrialised and industrialising countries) and

definitive rejection of the use of ozone-destroying substances in the medium term. This international 'ecological epistemic community' has been gradually constructed since the early 1970s. It federates various actors with specific reasons to wish to politicise the - then hypothetical - destruction of the ozone layer. A major challenge for atmospheric chemists was to gain recognition for their scientific discipline which had been marginal in the field of atmospheric sciences until then. NASA's objective was to achieve its 'environmental turnaround'. As for the U.N. Environment Programme (UNEP) launched in 1972, it aimed to become a key international institution. This informal community also includes negotiators from different countries with technocratic profiles along with members of national expert and regulatory agencies like the U.S. Environmental Protection Agency (EPA). [\[12\]](#)

Next are the US chemical companies. The USA banned CFCs in aerosol cans as early as 1977 at a time when most European Economic Community countries and also Japan refused to do the same. Therefore, these companies made a sustained effort to develop technological substitutes for CFCs in collaboration with experts from government departments and scientific agencies like the EPA. In the summer of 1987, DuPont de Nemours, the world's largest CFC producer, and some of its US counterparts gave up on their strategy of opposing a binding international treaty because they took very seriously the possibility that states would adopt it without their consent. However, they also thought it possible that this constraint could actually become an opportunity in the medium term. US industry was ahead of its overseas competitors in developing substitutes and hoped to obtain patents and develop new markets in the main growth sectors affected by the new regulations namely air conditioning, refrigeration, insulation and electronics. [\[13\]](#) The future was to prove US industrialists right. Also, the work on modelling stratospheric chemistry carried out by researchers at DuPont de Nemours and other major polluting companies also played a role. They confirmed the danger of a rapid and significant destruction of the ozone layer thus helping to convince their leaders of the need for a binding international treaty to deal with this issue.

As we can see, in the case of ozone, as with the vast majority of cases documented by the social sciences, the transition from a socio-technical controversy to sustainable governance requires the development of a representational framework and normative tools which work for a multitude of actors. The writer and director of [Ozone Hole: How We Saved the Planet](#) focuses on Thatcher's political speeches, and emphasises the persuasive role played by one of Reagan's close associates, George Shultz, who is said to have convinced Reagan to change his views behind closed doors along with, and played by "environmental lawyers, economists, and scientists" who aimed to end apathy about ozone policy in the early 1980s and are said to have built "such a robust case that the President simply could not ignore it". [\[14\]](#) [Lochhead](#) also rather satisfactorily documents the long-term contribution of the ecological epistemic community - particularly

atmospheric scientists - whose work was indeed particularly decisive regarding ozone in terms of awareness-raising, diplomacy and promoting the precautionary principle. [15] However, he avoids the long dynamics inherent to the public-private technological innovation we have just described. In other terms, he sets aside the 'material' dimension of the problem and, generally speaking, this dimension urgently needs to be rehabilitated.

Lochhead could also have looked at actors that historians have tended to discuss less. He emphasises the influence of popular television culture (advertising, soap operas) but almost completely overlooks civil society contributions from journalists (the 'fourth estate'), intellectuals and artists. And yet their views as expressed in the general media, satirical press cartoons, popular science or environmental magazines have played an important role. This particularly involves 'translating' scientific uncertainties about the extent of the destruction of the ozone layer into "considerations about what prudent political action may imply". [16]

Lochhead does not make more reference to the losers in this whole story either. These include the producers and users of the products affected by the regulations. These include also the scientists who opposed the theory of ozone depletion and the use of the precautionary principle (yet most of these, including the two leading British 'sceptics', the meteorologist Richard Scorer and the renowned geochemist James Lovelock, author of best-sellers on the Gaia hypothesis, were to take the side of pro-regulation atmospheric scientists shortly after 1985 when instrumental measurements of changes in Antarctic ozone concentrations grew in importance). [17]

These points are important. This is because the choice of main 'characters' in the narrative and the importance given to them are political choices beyond just the question of historical rigour which requires the maximum number of relevant actors to be taken into account. Such political choices create a hierarchy of actors' powers of action and thus distribute the cards of power.

Can lessons be learnt from 'history'?

After history as farce comes history as tragedy. After the ozone layer, we now need to deal with climate change, the 'new ecological disaster'. If we are to believe the last part of the film and the last sentence of the trailer - "it's that simple, folks!" - it would not be a particularly complicated task. [18] The idea underpinning this is that if the two main proponents of neo-liberalism and sworn enemies of the Greens agreed to protect the ozone layer in the 1980s, why wouldn't the heads of state of today do likewise regarding the climate? This conjecture is simplistic but nonetheless worth taking seriously. Using past experience to inform decisions regarding action in the present is possible to a certain extent. In this case, it even

seems a rather promising approach because the institutional expertise and governance modalities for climate change were broadly modelled on those for the ozone layer. There is only a past history dating back a few years as the Intergovernmental Panel on Climate Change (IPCC) was created in 1988, and the first Conference of the Parties (COP) on climate occurred in 1995. However, analyses have shown that mimetic reproduction of action on ozone framework for the climate quickly became impossible and would in any case have been incapable of involving States, territories and industrialists to an extent which would have been equal to the importance of this issue. [19]

Firstly, climate change policies have been constructed within a geopolitical framework that has moved away from the framework of the ozone layer as time has gone on. The growth of the major emerging economies and, more generally, increased multipolarity have reshuffled the cards. The universal cooperative action advocated by Thatcher and many heads of state in the late 1980s in response to global environmental risks has become mere 'fiction' again. [20] The US is now demanding firm commitments from China regarding the climate as was the case with 1987's international ozone layer while China is 'playing at' presenting itself as a developing country. However, the implications and reception of these discourses are no longer the same. [21] In fact, the only relevant geopolitical lesson to be learnt from the ozone affair is that US engagement is decisive in environmental matters and indeed in many other areas. The diplomatic weight of the leading economic, scientific and military power clearly has much greater influence than that of the European Union. The EU has become the locomotive of climate diplomacy but only advances at the speed of a steam engine. [22]

Secondly, in addition to these geopolitical dissimilarities, the material and social changes linked to reducing the emissions responsible for climate change are quite different in their diversity and scope from those linked to the ozone issue. This represents my more fundamental objection to the documentary's epilogue. Clearly, we could make lists of climate-friendly industries that need to be spurred on (renewable energy production, insulation materials, low-carbon vehicles, etc.). These represent substitutes for old technologies which need to be encouraged and also we could possibly strive to reproduce the regulatory and financial tools that were set up for the ozone issue. [23] However, this kind of approach relying mainly on technological solutions has already shown its limits in the field of climate change (economic thresholds, rebound effects or resistance from citizens), even though these climate-friendly technology has benefited from significant investment. Also changes in individual practices remain slow and can even be detrimental to the climate. In other words, a drastic reduction in greenhouse gas emissions represents much bigger a challenge to capitalism than abandoning ozone-depleting substances did. [24] Air conditioning is an edifying example. This industry has stopped using CFCs but has continued to grow rapidly (world air conditioner sales have quadrupled since 1990). This growth has been

accompanied by increased energy consumption and emissions of HFCs - the substitutes for CFCs and HCFCs - which are powerful greenhouse gases like their predecessors.

As a corollary to the impossibility of duplicating the "ozone policy miracle" which the UNEP Director General Mostafa Tolba believed in [25], one of the approaches suggested making up for the obvious failures of climate governance between 1990 and 2010 was precisely to move away from the stratospheric ozone policy model. Instead of mainly targeting the most polluting factories in industrialised countries (the logic underpinning the Montreal Protocol which was based on the logic of the 1997 Kyoto Protocol for the climate), the full spectrum of technologies concerned by regulations in the mobility and building sectors (etc.) was broadened. Also, alternative approaches to the simple set of technological standards driven by new actors gained ground at a time when international climate negotiations were not progressing. In particular, for the last ten years or so, emphasis has been placed (even in IPCC reports - although the response remains poor) on changes to individual practices regarding food, tourism and even work, and on reconfiguring territories and related services. The aim of this reconfiguration is to jointly develop infrastructures, technologies and citizens' practices in terms of mobility, heating, energy production and consumption and so forth. [26]

Finally, the history of climate policies seems to show that a very high level of citizen involvement and commitment is necessary if we are to see the emergence of mitigation policies which correspond to the importance of the issues at stake. Such citizen involvement requires pressure (public mobilisations, awareness-raising through various media, pressure to make ecology a core electoral issue, legal proceedings, etc.) and also everyday consumption practices need to change. [Lochhead](#) dismisses this hypothesis out of hand and is thus able to renew the model of the head of state saving the climate in a providential manner. Indeed, both the film and its trailer end with images of factory chimneys and exhaust pipes before showing Barack Obama and other government officials at the COP21 conference in Paris at the end of 2015. [27] As I mentioned earlier, this model disempowers viewers (... unless, of course, they themselves are members of highest level decision-making bodies). Besides, not only does the documentary's subtitle "how we saved the planet" contradict its demonstration that an enlightened elite's actions were the crucial factor, but it also gives viewers a clean conscience on environmental matters.

The political power of the scientific image and its artistic variations

Most authoritative eco-documentaries adopt a highly 'rationalist' view of policy action which tends to consider that robust scientific knowledge necessarily leads

to people's assent and even inevitably to action. However, regarding the environment (at least), historians have shown that a strong and widely accepted scientific consensus is often less of a decisive factor than the windfall effects that change offers and how strongly the actors concerned have a sense of danger and urgency. The IPCC's conclusions thus have a high level of consensual acceptance within the scientific community and the policy arena, but political action is still far below the level recommended by experts. Conversely, the Montreal Protocol was signed despite the absence of a robust scientific consensus - with the precautionary principle being invoked precisely because there was no satisfactory scientific evidence. [28]

How greatly people adhered to this precautionary principle owed much to the communication of scientific images and images 'derived' from these depictions (satirical drawings, superimposed images, artists' drawings of the globe, etc.) which could be interpreted by a broad audience as proving there was an imminent danger. The numerical simulations of the hole in the ozone layer broadcast by NASA from the end of 1985 onwards (see Figure 1 below) [29] were undoubtedly the most emblematic scientific images. The sense of danger and urgency is at its most compelling when people fear their short-term health is directly affected. The modelled image of the ozone hole's force derives precisely from its capacity to generate such a sense of immediate health risk. This is achieved by the image provoking the following double psychological response: 1/ it shows the fragility of the Earth; 2/ it makes people aware of the vulnerability of the skin which was itself in danger of being "pierced", analogously to the anti-UV shield the ozone layer represents and which is there to protect the skin. The artists who started producing images derived from the hole in the ozone layer rapidly understood and exploited this mechanism.

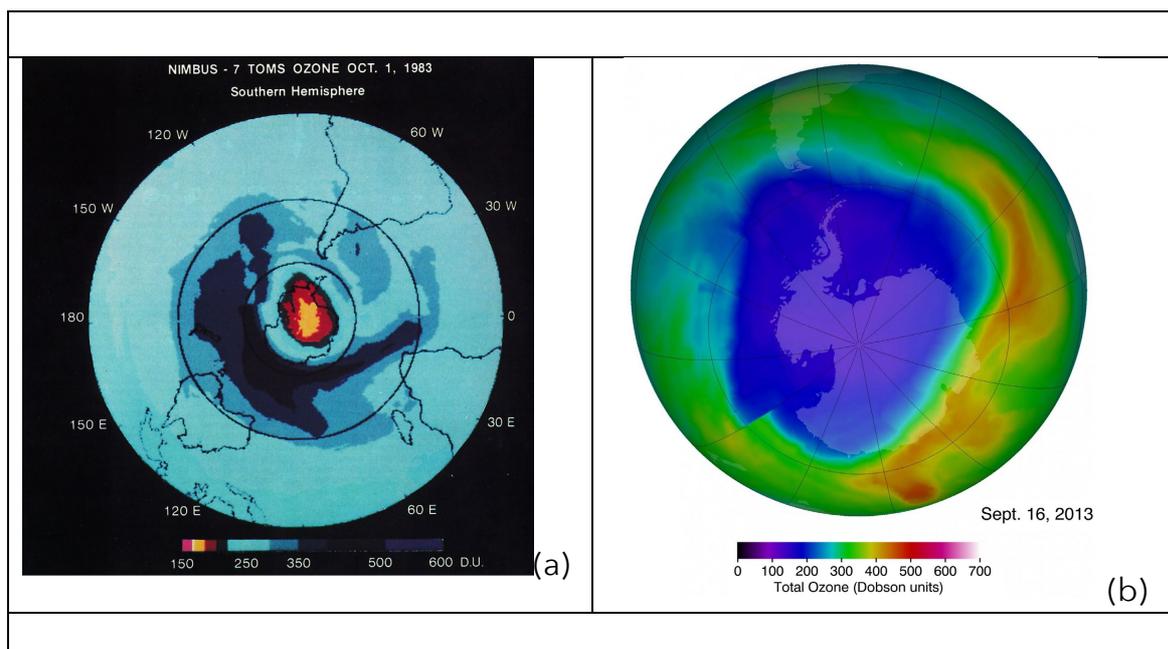


Figure 1: Representations of the ozone levels disseminated by NASA to show the existence of a "hole in the ozone layer" above the Antarctic: (a) the first of this kind published at the end of 1985 showing the situation on October 1st 1983; (b) a map dating from 2013, showing the situation on September 16th 2013 © NASA /GSFC [30]

The NASA image was an immediate success partly because of its cleverly 'orchestrated' colours and use of the term 'hole' (although there is still ozone in the stratosphere, even at the poles and in all seasons). It became the equal of another iconic environmental image, which was also an image of the 'Earth from above' namely the so-called 'blue marble' photograph taken by Apollo 17 in 1972. Also, although the existence of massive ozone depletion over Antarctica could not be confirmed during the negotiations for the Montreal Protocol, the hypothesis about this and the associated modelled image definitely made an impression following their distribution in the media and in the negotiation rooms. [31] Thus, one of the most important virtues of *Ozone Hole: How We Saved the Planet* is that it recalls the political role played by the scientific image of the ozone hole. [32]

Furthermore, eco-documentary filmmakers use scientific images for reasons that go beyond their archival function. The evocative power of such images helps raise awareness of environmental issues as indeed they were intended to do. This works by exposing three unseen realities. This first is that which is present but inaccessible to the senses. For example, Figure 1 shows images of digital models constructed from remote sensing measurements in the ultraviolet range and from scientific theories about the atmosphere. Secondly that which is present but occurs in another territory from the onlooker's own. These include images of people with skin cancer, the effects of increases in atmospheric temperature in different regions of the globe, and so forth. Thirdly, that of a bygone past (e.g. a photo of an abundant glacier in the Alps at the start of the 20th century) or of a hypothetical future. The images in Figure 1 were put together to portray evolution over time and can even combine these three absent realities: a sensitive portrayal of a reality which is inaccessible to the senses (measurements in the ultraviolet range); distant territories (the Antarctic, the atmosphere at an altitude of 15-20 km); a bygone past (the state of the ozone layer through the ages reconstructed using digital modelling) or possible futures (according to different prospective scenarios).

Although [Lochhead](#) uses other spectacular images like factory smoke, for example, he does not include other scientific images [33] or images produced by artists. And yet, writers and film-makers have proved that artistic, satirical and other drawings can play a political role. These 'counter-images', as Donna Haraway calls them, can work thanks to a form of 'counter-normative capacity' which is capable of triggering action and leading to change. [34] The hole in the ozone layer has led to the production of numerous counter-images in the mainstream press, in environmental NGOs' communication activities, in schools via UNEP programmes and so forth. The intention of such images is either to alert people to the danger

involved or to link the problem to harmful everyday practices (use of air conditioning, aerosol cans, etc.).

On the other hand, there is a long-standing history of collaboration between scientists and artists (such as scientific atlases in the 18th and 19th centuries) [35], for example in the form of "artists' views" representing the past of societies and the universe and their probable futures (Earth in the future, terraformed planets, space colonies, etc.). A modern-day extension of this is that artists' environmental images have found their place in the communication and prospective thinking of major scientific institutions (particularly NASA) [36], in the popularisation of science, and even in museums. However, although 'animated documentaries' have in a way fully established this process [37], 'artists' animated images' are having difficulty achieving the same prominence in the documentary genre. In an era of late modernity with its multiplied prospective exercises, documentaries using representations of artists from other arts than cinema could also play a role as collective incubators for the imaginary sphere by including representations of utopian or dystopian futures as alternatives to the scenarios and models produced by university science and design offices.

Increasing the use of images and audiovisual archives in the social sciences

Documentary film makers can adopt a historian's role and sometimes unearth valuable archives. In [Lochhead's](#) film this is particularly the case with the television advertisements for aerosols and refrigeration appliances that are shown. In the 1960s, 70s and 80s industrialists were already communicating to households partly through television advertising which means this needs to be taken into account. These documents help portray a certain form of indoctrination to persuade people to adopt a lifestyle involving unbridled consumption and enthusiasm for the latest technical innovations with, more often than not, the middle classes and those living in cities as early adopters whose example would be followed. This resulted in an explosion in the use of chemical products, including substances suspected of destroying the ozone layer since the 1970s (through the multi-usage of aerosols, people being excessively equipped with fridges and air conditioners, the frenetic consumption of electronics, etc.) [38]

[*Ozone Hole: How We Saved the Planet*](#) also draws on another piece of archive television footage from February 1975 - an excerpt from an episode of the sitcom *All In The Family* which was the most popular sitcom of the time in the United States. The former EPA official Stephen Andersen is interviewed and explains that at the "height of the public debate" about CFCs in the US, the character Gloria's decision to stop using hairsprays led to an immediate "national response": a spectacular drop in the buying of hairspray and deodorant sprays. [39] Whatever

the case, the television and more general audiovisual archives used in the documentary film can provide information for environmental history. [40]

To a certain extent, the social sciences have taken the measure of the epistemological and cultural importance of images and have given them an increasing place in their corpora over the last thirty years. This 'iconic turn' owes as much to interest in the material aspects of the production of knowledge in the history of science since the 1980s, [41] as to either a revival of cultural history or the growing importance of media history and information and communication sciences. [42] Images have a historical importance in the environmental sciences which means this phenomenon has been particularly significant in the environmental humanities. Nonetheless, images are still under-exploited as archival objects.

The social sciences have shown less interest in audiovisual archives right up to the present time even though the digital humanities are currently on everyone's lips. It is time for attitudes to change and for digital processing tools to evolve in parallel. In recent years, however, we have seen some small but encouraging signs. Firstly, the mistrust of historians and sociologists towards audiovisual archives is less marked today than it was twenty years ago. It is due to a lack of data about the mode of production of audiovisual archives and to the idea that written documents are more 'noble' and perennial. Secondly, a number of tools are emerging which allow quick searches for digitised audiovisual documents. [43] Finally, recent legal developments have made it easier for researchers to access audiovisual archives, particularly the French law on archives n°2008-696 dated July 15th 2008. [44]

Conclusions

In this article, I have proposed elements for thought about the construction of narratives and the use of scientific and artistic images in eco-documentaries. Study of the film [*Ozone Hole: How We Saved the Planet*](#) enabled me to highlight recurrent image and narrative motifs in eco-documentaries which are in conflict with historians' warnings. I have pointed out certain failings in the administration of historical evidence (although historians have documented the ozone affair quite well, at least from a Western perspective). Also, I have shown that directors' choices of actors and causalities depoliticise the past ozone narrative and actually exclude citizens from current climate action. This means they are hardly compatible with the films' implicit objective of inciting viewers to act politically if only as voters which requires perhaps the least real involvement.

Similar objections can be made about other eco-documentaries and environmental films. For example, couldn't opting for a disaster scenario - as in the title of our documentary [*Ozone Hole: How We Saved the Planet*](#) - make the film's argument vulnerable to legitimate criticism (choosing this particular potential

scenario would need to be justified) and also confine viewers to an experience of entertainment, impatience or just being absolutely staggered, none of which seems compatible with political action? This question is clearly relevant to dramas that spectacularly portray climate change as anthropogenic (*The Day After Tomorrow* (2004), *Geostorm* (2017)) which have become part of the category of disaster films and go hand-in-hand with natural disaster films (*Volcano* (1997), *Deep impact* (1998), *The impossible* (2012), *Pompeii* (2014)). It can also be asked of documentaries which portray endless desolation and create anxiety-inducing atmospheres, starting with the first mainstream eco-documentary, [An Inconvenient Truth](#) (2006). As another example, in *Dark Waters* (2019) isn't it the case that making a hero of a whistle-blowing lawyer almost single-handedly triumphing against his employer, the chemical giant DuPont (again), actually obscures a whole chain of equally essential actors? And doesn't it seem to portray industrialists as the scapegoats of a political and social system which even encourages their practices?

Different objections can be made about films like the French documentary [Demain](#) (2015) which are based on the massive and universal dissemination of alternatives. Are such films oblivious to regional differences and to the competitive advantage that states and large industrial groups have over citizen empowerment in any form? Also, surely they are preaching to the converted? As these observational eco-documentaries scrutinise and encourage local action, they seem to me to be the most promising type of eco-documentary for getting citizens involved in the struggle against climate change, air pollution or other environmental damage that requires a high level of strong citizen commitment. However, it would be preferable for such films to go beyond the form of a 'patchwork' of positive initiatives more often to describe the power relationships, cultural (anthropological, political) mechanisms and territorial logics that prevent 'best practices' being shared with the largest possible audience. Furthermore, it is increasingly essential to deal with metropolises and world cities, and not just sparsely or moderately populated territories as is the case with documentaries on neo-rural areas and little cities (as does the French documentary [Grande-Synthe. La ville où tout se joue](#) (2018)). For economic reasons, the larger cities have become the preferred urban development model, and they are also frequently presented as being the territories with the most immediate potential for the 'transition to the low-carbon world'.

The second idea I put forward concerns the place of images and videos in environmental history. As I said, I would very much like to see audiovisual archives promoted to a higher rank in the discipline. I consider this growth inevitable in an era in which audiovisual media have a central place in our minds as "voluntary prisoners in the virtual world" whose representations they shape.

I also see potential for positive collaboration between documentary filmmakers and historians. The latter often play a centre role in historical documentaries (which is not necessarily a guarantee of quality) but this is less the case with eco-documentaries which prefer the figure of the social scientist to elected officials, community activists or nature scientists. [45] I therefore suggest that eco-documentary filmmakers should include the views of social scientists on a more systematic basis. Firstly, the cooperation of social scientists would provide greater historical rigour and a greater diversity of points of view (particularly because they often have more contrasted analyses than natural scientists who generally tend to be more consensual). Secondly, this kind of cooperation could in turn make historians aware of the value of using audiovisual documents to construct their own narratives. Finally, this would also make it possible to disseminate social scientists' work to a broader audience. This could potentially have the effect of re-politicising the message of such documentaries.

I would even suggest that we take a further collaborative step by more frequently getting social scientists involved in writing films as scientific advisors or even co-screenwriters. There are very few examples of documentaries written by historians. [46] Often researchers have neither the time nor the skills to effectively write such films on their own. This work could therefore be done in collaboration with someone from the documentary film sphere. The Pariscience festival organises sessions in which documentary filmmakers and academics can meet. I am delighted to see this kind of institutional initiative and would encourage more personal approaches.

I would indeed wager that many virtuous cooperation opportunities could develop between documentary filmmakers and historians and that eco-documentaries could include historians' warnings and a greater diversity of views on a subject. This would also help them reach a significantly broad audience. There have already been successful examples (such as the French documentary *OGM. Mensonges et Vérités* (2016) recently broadcast on Arte). The biggest challenge is likely to lie in convincing - or bypassing - existing documentary industry producers. These producers are often stuck on a film model that, as I have shown, does not show the multi-level and long-term nature of political and cultural dynamics and restricts the viewer to a position as a spectator of politics.

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[1] Bondebjerg, Ib, 2020, "[Eco-documentaries: Cognition, Emotion and Narrative](#)", *Traverses* #2.

[2] [Lochhead, Jamie](#), 2018, [Ozone Hole: How We Saved the Planet](#), duration : 01:00:00, film which can be viewed free of charge at <http://www.jamielochhead.com/#/ozonehole>. The film was later broadcast on *Arte* with the French title: [Ozone. Un sauvetage réussi](#) (2018).

[3] This article also gives me a chance to tell the story of an important but little-known moment in environmental history namely the construction of the governance of the ozone layer.

[4] Bondebjerg, 2020, *op. cit.*

[5] The writer and director of [Ozone hole: how we saved the planet](#), [Jamie Lochhead](#), has also written and/or directed several feature-length documentaries (or documentary series) about the natural sciences' knowledge of the animal world (*Inside Nature's Giants* (2011), *Foxes Live: Wild in the City* (2013), etc.), or which tell the story of famous episodes in the history of science (*Einstein's Quantum Riddle* (2019), *Inside Einstein's Mind* (2015)). One was made in parallel to [Ozone hole: how we saved the planet](#) and is about the scientific construction of the hole in the ozone layer (*Saving Planet Earth: Fixing a Hole* (2018, Windfall Films, duration: 1:00:00)).

[6] [Lochhead, Jamie](#) & Charlotte Hunt-Grubbe, *The Hole: How Ronnie and Maggie saved the world*, film which can be viewed free of charge at <https://www.youtube.com/watch?v=M2JzOIRff08>, duration: 00:05:17

[7] For a detailed description of the controversy within the Reagan administration, see Booth, Nicholas, 1994, *How soon is now? The truth about the ozone hole*, Simon & Schuster, pp. 327-331

[8] Harrabin, Roger, 2013, "Margaret Thatcher: How PM legitimised green concerns", BBC website's article, 8 April 2013, <https://www.bbc.com/news/science-environment-22069768>; Litfin, Karen, 1994, *Ozone Discourses. Science and Politics in Global Environmental Cooperation*, Columbia Press, "Chapter 5"

[9] Thus, the central character of the first major film in the genre, [An Inconvenient Truth](#) (2006) is the unsuccessful 2000 US presidential candidate Al Gore. "In the film," explains Ib Bondebjerg, "Gore uses his personal background and memories to create pathos and emotion. The "personal ethos" of this media figure ("his sympathy capital and political credibility") plays an important role in convincing the viewer and creating a phenomenon of identification [Bondebjerg, 2020, *op. cit.*]

[10] [Lochhead](#) & Hunt-Grubbe, 2018, *op. cit.*, 00:00:15-00:00:21

[11] Regarding Thatcher, the author of the documentary emphasises her knowledge of and sensitivity to the ozone issue which he puts down to her training as a chemist. This is an interesting and plausible insight. However, Thatcher subscribed to the ethos of private industry chemists, having worked for BX Plastics and then J. Lyons & co. after university,

which hardly predestined her to become an environmentalist. And indeed, she did not become one, the contrary was the case. However, as Jonathon Porritt, director of the UK office of *Friends of the Earth* from 1984 to 1990, has explained, Thatcher's speeches 'during her short green period' helped to get the environmental movement in the UK off the ground in the late 1980s [quoted in Harrabin, 2013, op. cit].

[12] Haas, Peter, 1992, "Banning Chlorofluorocarbons: Epistemic Community Efforts to Protect Stratospheric Ozone", *International Organization*, 46/1, pp. 187-224 ; Conway, 2008, op. cit.

[13] Parson, Edward, 2003, *Protecting the ozone layer – science and strategy*, Oxford University Press ; Andersen, Stephen & Madhava Sarma, 2002, *Protecting the Ozone Layer – the United Nations History*, UNEP/Earthscan, pp. 50-91 ; Litfin, 1994, op. cit., "Chapter 4"

[14] [Lochhead](#) & Hunt-Grubbe, 2018, op. cit., 00:02:55-00:03:04

[15] On this point, see for example Gribbin, John, 1993, *The Hole in the Sky: Man's Threat to the Ozone Layer*, Bantam Books, pp. 107-162

[16] Walker, Kenneth, 2016, "Mapping the contours of translation: visualized un/certainties in the ozone hole controversy", *Technical Communication Quarterly*, 25/2, p. 113

[17] Briday, Régis, 2014, *Une histoire de la chimie atmosphérique globale. Enjeux disciplinaires et d'expertise de la couche d'ozone et du changement climatique*, doctoral thesis in history, EHESS/Alexandre Koyré Centre, <https://hal.archives-ouvertes.fr/tel-01213826/>, pp. 313-434 ; Lovelock, James, 1990 (1988), *The ages of Gaia. A biography of our living Earth*, Oxford University press, pp. 167-170

[18] [Lochhead](#), 2018, op. cit., 00:41:49-00:46:20 ; [Lochhead](#) & Hunt-Grubbe, 2018, op. cit., 00:04:25-00:05:05

[19] Grundmann, Reiner, 2006, "Ozone and Climate: Scientific Consensus and Leadership", *Science, Technology & Human Values*, 31/1, pp. 73-101

[20] Aykut, Stefan & Amy Dahan, 2014. *Gouverner le climat ? 20 ans de négociations internationales*, Paris, Les Presses de SciencesPo, pp. 261-324 & 400-437

[21] I would add at this point that the documentary is strikingly Western-centric. This cannot be justified simply by the choice of Reagan and Thatcher as the central narrative figures as this Western-centricity, and more specifically a state-centricity, can also be observed in historians who did little to document the political implications of the ozone layer crisis outside the United States, even excluding Japan and Europe. At the very least, a documentary that proposes lines of thought on today's environmental diplomacy surely must refer to certain recent significant reconfigurations in geopolitics, the international economy and the geography of scientific production. More generally, the Western-centricity of most documentaries screened and broadcast in Europe and North America is disturbing because it does not reflect the new geopolitical power relations and also because it leads to Westerners being kept in a certain form of self-contemplation which is both flattering and unflattering but hardly favourable to the movement.

[22] This does not mean that the US was the only wealthy country promoting a binding international treaty to phase out the production of substances which harmed the ozone layer in the mid-1980s. It did this as part of a consortium known as the 'Toronto Group' alongside Canada, Finland, Norway and Sweden.

[23] This is the argument – which does not convince me - of this book: Sarma, Madhava & Kristen Taddonio, 2007, *Technology Transfer for the Ozone Layer: Lessons for Climate Change*, Earthscan.

[24] Thatcher states in her book *Statecraft* (2003) that the international effort to limit climate change provided "a marvellous excuse for worldwide, supra-national socialism". She was in fact merely acknowledging the inability of current capitalism to deal with the problem of greenhouse gas emissions [Thatcher, 2003, in Harrabin, *in* Harrabin, 2013, *op. cit.*]

[25] Agrawala, Shardul, 1998, "Context and early origins of the Intergovernmental Panel on Climate Change", *Climatic Change*, 39, pp. 605-620

[26] In parallel, cross-sectoral (taking the issue of climate into account in each sector of activity and public action) and inter-sectoral (coordinating several sectors to deal with this problem) approaches have been promoted. The risk here is that such programmes will get no further than speeches or get bogged down because they require high levels of coordination of and involvement and commitment from a great number of varied actors most of whom have limited economic and communication tools (compared with States).

[27] [Lochhead](#) & Hunt-Grubbe, 2018, *op. cit.*, 00:04:33-00:04:42 ; [Lochhead](#), 2018, *op. cit.*, 00:41:49-00:46:20

[28] Litfin, 1994, *op. cit.* ; Grundmann, 2006, *op. cit.*

[29] Grevsmühl, Sebastian, 2017, "A visual history of the ozone hole: a journey to the heart of science, technology and the global environment", *History and Technology*, 33:3, pp. 333-344 ; Walker, 2016, *op. cit.*

[30] I have included Grevsmühl's Figures 3 and 4, 2017, *op. cit.*, pp. 339-340

[31] Grevsmühl, Sebastian, 2014, *La Terre vue d'en haut. L'invention de l'environnement global*, Seuil; Grundmann, Reiner, 2002, *Transnational Environmental Policy: Reconstructing Ozone*, Routledge, pp. 171-172

[32] [Lochhead](#), 2018, *op. cit.*, 00:25:40-00:31:08

[33] The same is true of the documentary *Saving Planet Earth: Fixing a Hole* which Lochhead made at the same time as [Ozone Hole: How We Saved the Planet](#) and which specifically focuses on the construction of the scientific theory of stratospheric ozone destruction.

[34] Haraway, 1997, *in* Walker, 2016, *op. cit.*, p. 107

[35] Daston, Lorraine & Peter Galison, 2007, *Objectivity*, Zone Books

[36] Since its creation in 1958, NASA has been running "visual campaigns" for the general public which involve photographers, filmmakers and representatives of the visual arts. The NASA *art program* was created in 1962 and since then has produced a wide range of drawings and paintings. The aim of this is to create media events based on NASA's missions by going further than the aesthetics of the scientific images produced daily by its teams to popularise its members and their work, to re-situate the institution in a long narrative of success and progress, etc. (portraits of astronauts, a stylised view the final descent of the Cassini probe to Saturn at the end of 2017, visual portrayals of freshly discovered exoplanets for a broad audience, etc.) [NASA website, 2017, "NASA and Art: A Collaboration Colored with History", <<https://www.nasa.gov/feature/nasa-and-art-a-collaboration-colored-with-history>>, page published on April 18th 2017, accessed 12/06/2020]

[37] In *Traverses #1*, [François-Xavier Destors](#) showed the possibilities offered by animated documentaries, "which go on a search for the traces and fragments of the past and the 'we' of collective memory" [[Destors, François-Xavier](#), 2017, "[Le documentaire animé et l'image réparatrice](#)", *Traverses #1*].

[38] Between 1960 and 1974, the annual world production of CFC-11 increased fivefold while the production of CFC-12 increased sevenfold. In the early 1970s, total CFC production was nearly 1 million tonnes. US aerosol users alone used about 200 kilotons [*Alternative Fluorocarbons Environmental Acceptability Study Data*, 1996, in Parson, 2003, op. cit.]

[39] [Lochhead](#), 2018, *op. cit.*, 00:19:15-00:21:50

[40] I recommend the following historiography of the field of environmental history: Fressoz, Jean-Baptiste, Frédéric Graber, Fabien Locher & Grégory Quenet, 2014, *Introduction à l'histoire environnementale*, La Découverte

[41] Latour, Bruno, 1986, "Visualization and cognition", *Knowledge and society*, 6, pp. 1-40; Daston & Galison, 2007, *op. cit.*; Grevsmühl, 2014, *op. cit.*

[42] Guyot, Jacques & Thierry Rolland, 2011, *Les archives audiovisuelles. Histoire, culture, politique*, Armand Colin

[43] I am particularly thinking of the "plateforme d'extraction automatique de métadonnées et d'exploration innovante des contenus audiovisuels" ("*automatic metadata extraction and innovative exploration platform for audiovisual content*" - P.I.T.S, Paroles, Images et Textes des Savoirs, *Speech, Image and Texts on Knowledge*) on the Canal-U website - an experimental project carried out in the framework of a partnership between the Fondation Maison des Sciences de l'Homme and Orange research teams
See <<http://pits.explorescence.com/canalu>>.

[44] Guyot & Rolland, 2011, *op. cit.*

[45] However, there are exceptions such as '[Les Apprentis Sorciers du Climat](#)' by [Pierre-Oscar Lévy](#) (2015) whose argument is essentially based on the work of the historian and philosopher Clive Hamilton.

[46] I recommend the fine documentary *Mechanical Marvels: Clockwork Dreams* written by the British science historian Simon Schaffer (2015).