BREAKING THROUGH: HOW DOCUMENTARY FILMMAKERS EXPOSE AND UNRAVEL THE FOSSIL FUEL HEGEMONY

by

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ABSTRACT

By analyzing contemporary environmental films within Antonio Gramsci's theoretical framework of hegemony, this MFA thesis highlights a path for storytellers and science communicators to overcome hidden barriers built into the language of environmental activism. Part one uses scientific papers, academic research, and my MFA thesis film *No Time for Trees (2022)* to scrutinize the environmental stewardship activity of tree planting, which municipal governments and non-profit organizations often promote as a strategy to sequester atmospheric CO2 emissions. It will contextualize the hegemonic "tree planting message" as a false narrative that empowers individuals to partake in ineffective strategies to combat global warming. Part two examines *The 11th Hour (2007)* to identify how a documentary's narration impacts how viewers assess their role in the environmental arena. It identifies the pronoun "we" as a small but influential element of the film's language that may connote hegemonic messaging that blames individuals for climate change and directs them to see it solved. Finally, part three examines several rhetorical film strategies used in *Merchants of Doubt (2014)* to expose the fossil fuel industry's comprehensive history of deception. Even will limited visual evidence of hegemony, films can help viewers think critically about stories they hear in the news media or within publications that skew climate science to favor the continued use of fossil fuels.

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“To destroy is always the first step in any creation.”

-ee cummings

INTRODUCTION

Reducing greenhouse gas emissions starts by dismantling a subversive system of control embedded into the rhetoric of visual media storytelling. Society is often unaware of this influence, yet it has been a powerful tool for the fossil fuel industry to shape public convictions about climate change. Convictions are not truths but rather strong beliefs based on an interpretation of facts. Philosopher Friedrich Nietzsche warned that "Convictions are more dangerous enemies of truth than lies" (Nietzsche). The word is known as the mental state of being fully persuaded. The etymology originates with two Latin root words: *con* (meaning "with") and *vincere* (meaning "to conquer"), suggesting that our thoughts and ideas are the result of a power struggle and that asking people to change their convictions is akin to a declaration of war.

If threatened, groups sharing a common conviction may band together to safeguard and defend their convictions. This all-out offensive on people's minds connects to a philosophical idea by Italian scholar Antonio Gramsci (1891-1937) called hegemony. He theorized that hegemony is a system of cultural and ideological control that is "inherently dangerous and…deliberately used to divert, mislead, and deny in order to preserve the political-economic status quo" (Cohen, 162). Hegemony enlists the public to support, promote, and uphold a small but influential group's wealth, power, and influence, often against their own interests.

> "In hegemonic terms, capital interests can hope for nothing better than a passive and loyal public that feels good about participation in a system created to preserve the status quo even as it purports to evolve in partnership with society as a whole. The manufacture of an image that seduces the public and enlists them in a common enterprise, yet deliberately or incidentally avoids furnishing or obfuscates real information about the issues, is what is so dangerous about hegemonic discourse" (Cohen, 151).

In sum, hegemony is based on consent. It enables leaders and groups to retain their economic power by saturating cultural institutions such as schools, churches, politics, and the news media, with narratives that seem to uphold the common good but are actually masked mechanisms of control used to shape the future that only benefits their capital interests (Cole).

Today, the hegemony of fossil fuel interests is arguably the most powerful on Earth. It prioritizes wealth and power above all life on earth and the stability of the natural world. Before environmental-climate science, the fossil fuel industry propelled civilization into a new era of growth and innovation. Coal-powered artificial light helped people be more productive in darker hours of the day. Coal also enabled mass printing and publishing to a worldwide audience. Gasoline-powered engines accelerated travel to farther places in less time. Natural gas ran heating and cooling systems, providing the conditions for survival inside our homes. Without fossil fuels, there would be no ink, internet, or space exploration without fossil fuels. The fossil fuel industry provided society with enormous and unlimited benefits for more than two hundred years. But then, in the late 20th Century, climate scientists revealed startling news: burning fossil fuels was causing permanent and irreversible damage to all life on Earth.

After scientists established an unequivocal link between fossil fuel emissions and global warming, individuals around the world began changing their convictions about this energy source. Rather than helping society find meaningful solutions to reduce fossil fuel dependence, however, large corporate emitters chipped away at their responsibility by convincing individuals to share the blame for climate change and the burden to see it solved (Mann). The hegemony of fossil fuel interests convinced people to invest their time, money, and energy into activities to help heal the planet. The truth, however, was that these measures did very little to solve the

problem or stall further environmental harm. Instead, they were merely distractions so fossil fuel interests could continue to profit. The hegemony maintained the status quo while the hopeful public thought they were healing a suffering world in concert with the industry and their leaders.

Breaking through the veil of hegemony and undoing its grip on the public's convictions about climate change first requires exposure. "...Hegemonic conceptions can be unraveled only if they are exposed; or more realistically, so long as they remain embedded and are not critiqued, they cannot be unraveled"(Cohen 154). Documentary film is a vital medium for education and activism about climate change, as well as for exposing hegemonic narratives. Even so, some climate change documentaries fall victim to hegemonic narratives that blame individuals for perpetuating greenhouse gas emissions or failing to see solutions implemented.

There are two types of climate change documentaries: deductive and inductive. Deductive climate change documentaries focus on why climate change is a problem and how it affects the planet. *An Inconvenient Truth* and *The 11th Hour* are two deductive films that use climate science to frame the issue of climate change. These filmmakers argue that if the problem is global warming, and if the cause of the problem is the rate of fossil fuel emissions entering Earth's atmosphere, then humanity can solve global warming by reducing the rate of fossil fuel emissions entering the atmosphere. Films in this first category of climate change films present visual evidence of how climate change impacts ecosystems. They may also discuss the socio-economic factors that have enabled fossil fuel emissions to remain at dangerous levels but often fall short of clarifying *how* emissions should be reduced and *who* is responsible for seeing it done. Finally, despite their best intentions to bring awareness to climate science, these films

may fall victim to hegemonic rhetoric that directs blame toward the public rather than the fossil fuel industry.

Inductive documentaries focus on why global warming solutions are not being implemented and how fossil fuel companies prevent the reduction of emissions for their capital interests. *Who Killed the Electric Car (2006), Greedy Lying Bastards (2012), Marchants of Doubt (2014), and The Story of Plastic (2019)* are films that reveal how the fossil fuel industry shapes public and political convictions about climate science. Inductive climate change films connect observations from visual evidence (often archival footage or clips from news media) to present a theory that fossil fuel interests use their wealth and power to delay meaningful action on global warming. These films influence the public to break through narratives that encourage mitigation strategies for fossil fuel emissions rather than reduction strategies. After all, efforts to reduce emissions must start with actually reducing emissions, not band-aid solutions that give society a license to keep consuming. These films are immensely vital to society. If these filmmakers can connect the hegemony of fossil fuel interests to stalled political efforts to reduce fossil fuel emissions, then maybe the public will cease participating in the wrong solutions for global warming.

In inductive climate change films, filmmakers highlight two types of hegemonic narratives used by fossil fuel interests: propaganda and deflection. Propaganda persuades the public, often through fear, to adopt the convictions of those in power or risk a very dire reality. These narratives posit that changing the status quo would drastically reduce people's freedoms and quality of life. Fossil fuel interests confuse the public by spreading propaganda that details fake science and false information to downplay the severity of the climate crisis. In addition,

propaganda also forces climate scientists to prove the legitimacy of *their* data to the public rather than the illegitimacy of keeping the rate of emissions entering the atmosphere unchanged. When effective, propaganda consolidates ideological conflict about climate change within social environments where it is less likely to threaten the power or capital interests of the fossil fuel industry.

Deflection narratives redirect the focus from the activities of those in power to the activities of the general public. This messaging is much more subversive and, arguably, a lot more nefarious. By design, deflection narratives convince and empower individuals to "heal the planet" by either changing their lifestyles in small ways (e.g., turning off light bulbs, riding a bicycle, using a reusable water canteen, driving an electric car) or participating in forms of environmental stewardship (e.g., recycling plastic, planting trees, cleaning up litter). Unfortunately, with the people preoccupied with these wholly inadequate solutions, the fossil fuel industry keeps emitting, thereby furthering the extent of environmental damage and lessening the time the world has to reduce the rise in global temperature. Deflection narratives are more challenging to unravel since they convince the public that doing something is better than doing nothing, even if those measures do not significantly impact the environment. Furthermore, in doing something, individuals may experience an expiation of guilt by contributing to a problem they feel responsible for and invested in solving. After exposing deflection narratives, individuals may request an alternative to their hegemonic activities that can proxy for their lifestyle changes or environmental stewardship. Unfortunately, the only viable alternative to their former hegemonic mentality is political activism and participating in a legislative area that is still wrought with hegemony.

INTENT OF PAPER

This paper **explores** how documentary storytellers reveal deceptive narratives about climate change that sustain the hegemony of fossil fuel interests. Part one uses scientific papers, academic research, and my MFA thesis film *No Time for Trees (2022)* to **scrutinize** the environmental stewardship activity of tree planting as a strategy to sequester atmospheric CO2 emissions. It argues that the "tree planting message" enables fossil fuel interests to distract the public with empowerment programs that are insufficient approaches to global warming. Part two **analyzes** the use of the pronoun "we" in the narration of *The 11th Hour (2007)*. It argues that documentary films about climate change can appropriate hegemonic rhetoric and influence how viewers assess their role in the problem of and solutions for global warming in a problematic way. Finally, part three **examines** several rhetorical film strategies used in *Merchants of Doubt (2014)* to expose the fossil fuel industry's comprehensive history of deception. It argues that filmmakers can craft limited visual evidence to make convincing arguments and inspire viewers to think critically about climate science topics in the media.

PART ONE: ENVIRONMENTAL STEWARDSHIP AND TREE PLANTING

For generations, people from all walks of life around the world have planted trees to combat the effects of human-caused climate change, hoping that just one tree planted could slow the damage to an Earth poisoned by the burning of fossil fuels. Unfortunately, the message that tree planting is an effective form of environmental stewardship is a powerful hegemonic concept that has, for nearly half a century, enabled greenhouse gas polluters to divert culpability for the climate crisis onto individuals to delay the need to reduce emissions from the source. My MFA Thesis film *No Time for Trees* originated from a desire to investigate how this message originated, contextualize the science of tree planting, and offer the public a new perspective on environmental stewardship programs that claim to mitigate damage to the natural world.

No Time for Trees was influenced by a film that issued a warning about another form of environmental stewardship: recycling, the voluntary practice of turning in consumer product packaging to government programs or facilities so that the materials can be reused or repurposed in the creation of new packaging, materials, or consumer goods. *The Story of Plastic*, co-written, directed, and produced by Montana State University MFA Science & Natural History Filmmaking alum Deia Schlosberg argues that municipal programs can only recycle a tiny fraction of plastic waste, despite their promotion of recycling as an impactful way to solve the plastic pollution crisis. Instead of investing in sustainable or biodegradable packaging alternatives to plastic, the film finds that the fossil fuel industry reinforces its business model by

building new micro-plastic facilities. And given the rate of new plastic production, the film describes recycling as bailing out a bathtub while the faucet is on full blast (The Story of Plastic).

Schlosberg exposes how the hegemony of fossil fuel interests encourages the public to participate in recycling as a way to distract society away from reducing its dependence on fossil fuels. The industry claims that the public demand for plastic warrants the ramp-up in supply. Yet, Schlosberg categorizes this claim as a way for the fossil fuel industry to maintain its capital interests in the face of an increase in regulations on fossil fuel as an energy source. In April 2022, the State of California launched an investigation into the fossil fuel and petrochemical industries for "their alleged role in causing and exacerbating a global crisis in plastic waste pollution" claiming that "despite the industry's decades-long recycling campaign, the vast majority of plastic products, by design, cannot be recycled and the U.S. plastic recycling rate has never broken 9%" (Rust). California Attorney General Rob Bonta argues, "For more than half a century, the plastics industry has engaged in an aggressive campaign to deceive the public, perpetuating a myth that recycling can solve the plastics crisis" (Rust). While this investigation is historic, it sparks a conversation about other forms of environmental stewardship that claim to be effective but are actually mechanisms for the fossil fuel industry to deceive the public.

Tree planting is another environmental stewardship activity that purports to help the environment but has not garnered the level of criticism of recycling. Despite scientific evidence proving it ineffective at achieving the goals it advertises, tree planting is still culturally embedded in American society as a solution to global warming. In his book *Planting Nature: Trees and the Manipulation of Environmental Stewardship in America*, Professor Shaul E. Cohen reveals that tree planting to sequester atmospheric CO2 emissions is a hegemonic concept

designed to enlist individuals within society to solve global warming without reducing their dependence on fossil fuels. The "tree planting message"

> "...speaks of inclusion and engendering a sense of capability, yet its triumphant tone and grand agenda help to mask a mechanism for concentrating power and agency in the hands of those already vested with it -- that is, capital interests and the political system that responds to their needs. Ultimately, the discourse contributes to a hegemonic conception that hands nature over to those who seek to profit from its management, in spite of the obvious costs of doing so, which capital interests share far more generously with the public than the profits"(Cohen, p. 162).

According to Cohen, "This message begins in grade school and youth organizations, where tree planting is linked with civic duty, local and national identity, beautification, and environmental health. Children are encouraged to…take pride in the stewardship that tree planting represents"(Cohen, p. 15). In addition, people learn to offset their carbon footprints with trees as they grow older. Tree planting is a cultural way to rectify burning fossil fuels and expiate guilt. (Cohen 89). Understanding how tree planting became known as an effective form of environmental stewardship requires some perspective on the history of trees within urban environments.

The "tree planting message" originated with scientific discovery. In the 1990s and 2000s, the professional field of urban forestry expanded mainly in response to the groundbreaking work of Dr. David Nowak. As a scientist for the US Forest Service, Nowak is one of the early pioneers in the professional field of urban forestry. Before his research in the early 1990s, people primarily planted trees to honor loved ones, mark special occasions, or ornamental purposes. In the early colonial days in America, citizens found trees could mitigate respiration problems

caused by the dirt plumes from horses or reduce heat in town centers, but for the most part, trees were just pleasing to the eye. Nowak's findings in the 1990s, though, changed *why* people plant trees.

Using satellite images of urban environments, he and his colleagues collected ground and canopy data to assess the power and potential of trees in America. They evaluated the "ecosystem services," or environmental benefits of trees, including air filtration, pollution control, soil and water retention, CO2 sequestration, shade, heat reduction, and savings on household energy. Nowak also calculated how urban trees save energy costs, increase property values, reduce crime, influence shopping decisions, and are valuable assets to a city's economy. Nowak continued collecting data around the world on urban trees until he retired from the US Forest Service in 2020. By then, he had published more than 140 scientific papers (peer-reviewed) about the ecosystem services of urban trees.

The environmental benefits of tree planting are often promoted to justify and incentivize tree planting programs to mitigate global warming. Municipal governments, state and local foresters, environmental organizations, energy companies, the timber industry, and a handful of influential non-profit organizations echo the same rhetoric about the benefits of trees through brochures, websites, lectures, and commercials. Often, this literature highlights the environmental ability of trees but leaves out any mention of national or global CO2 emissions, thereby making the impact of trees seem more significant than it is. Also, "estimates of carbon sequestration by urban vegetation have rarely been compared with the carbon emissions of cities to assess the potential importance of the former as a mitigation strategy" (Eisenman).

Furthermore, tree planting programs are "being institutionalized" at a federal level even though "tree mortality studies suggest that many trees may not survive to provide the ecosystem services that motivate planting campaigns" (Eisenman). While Nowak and his colleagues conducted crucial scientific work to understand the urban ecosystem, policymakers funded tree planting programs in lieu of imposing limits on CO2 emissions at the source.

According to the United States Environmental Protection Agency's *Inventory of U.S. Greenhouse Gas Emissions and Sinks 1990-2020* report, carbon dioxide is the primary greenhouse gas emitted by human activities in the United States, representing approximately 80% percent of total greenhouse gas emissions. The report identifies fossil fuel combustion, mainly from transportation and energy use, as the largest source of CO2. From 1990 to 2020, total U.S. emissions have increased by almost 2% (EPA). Atmospheric CO2 is being released at a rate that is 100x faster than the ability of natural ecosystems to absorb it from land, air, and sea (Lindsey). At present, Earth's forests and soil only absorb about 30% of atmospheric carbon dioxide (Domke). In US Forests, CO2 sequestration will decline by 2050 "largely because of the combination and interaction among forest aging, forest disturbance, and land-use change" (Domke). Forests in the Rocky Mountains are expected to be heavily damaged by wildfires and insect infestations (caused by climate change). The US Forest Service projects that carbon dioxide sequestration in this region will decline to near zero and possibly become a source of carbon dioxide emissions (Domke).

Planting new trees in Earth's forests will not reduce atmospheric CO2, especially in the time needed to combat global warming and prevent irreversible environmental damage. The most recent reliable estimate from the IPCC suggests that planting 2.3 billion acres of new

forests could help limit global warming to 1.5 degrees above pre-industrial levels by 2050 (IPCC). Those trees could potentially store more than 200 billion tons of CO2 by the end of the century (IPCC). While that sounds substantial, Sassan Saatchi, a senior scientist at NASA's Jet Propulsion Laboratory, estimates that reforesting that many acres, a size equivalent to the United States and Canada combined, could take between one and two thousand years, assuming we plant 2.5 million acres a year and each acre contains at least 25 to 50 trees to create an appropriate treetop canopy cover (Buis).

Planting new trees in Earth's urban areas will also not impact atmospheric CO2. Dr. David Nowak's studies from the 1990s even calculated that planting 100 million trees (and growing them to maturity) around residences in the United States would only offset less than 1% of United States emissions over a 50-year period (Nowak). Furthermore, planting 100 million trees over 50 years would produce the same effect as increasing the fuel efficiency of automobiles by 1.17mpg. (Nowak, et al.). Today, in the contiguous United States, urban trees only capture approximately 0.05% of annual carbon dioxide emissions per year (Domke). This amount is equivalent to the country's emissions over a 5-day period (Nowak). And, since large healthy trees (over 30inches in diameter) sequester 90x more carbon annually than small trees, we wouldn't even have the benefits of large-scale urban tree planting until the trees come to maturity, about 5-15 years after they are planted (Nowak).

Despite the science showing CO2 emissions to be far greater than the ability of trees to sequester it, the hegemony of fossil fuel interests relies on non-profit organizations and other cultural institutions to promote the narrative that trees are a viable solution to global warming. There are many examples from print publications, websites, instructional videos, and television

commercials spanning the period between 1977 and 2022 that promote tree planting for its environmental benefits and ability to sequester CO2. Two examples originate from publications by The Arbor Day Foundation and American Forests, leading non-profit membership organizations established around tree preservation and planting. Since the 1990s, these organizations have created nationwide programs that incentivize the public to plant trees or donate to tree planting initiatives based on their environmental benefit.

The first example is The Arbor Day Foundation television commercial *Plant a Tree with John Denver*, which first aired on American television in 1989. The spot promoted its environmental stewardship program, Trees for America. In the ad, the famous musician John Denver sings, "Plant a tree for your tomorrow. It's your tree that clears the air. Plant a tree, Trees for America, plant a tree for all the world to share." In one particular clip, two adults help two children plant a tiny sapling while the smog and buildings of Los Angeles fill the background. This famous commercial promoted the message that trees (and tree planting) clear the air worldwide. As of April 2022, The Arbor Day Foundation still claims "Trees help reduce the effects of climate change" on the "Tree Facts" section of its website arborday.org. (Arbor Day Foundation).

The second example comes from the Summer 1996 article "Urban Trees and Carbon" published in "American Forests" magazine. The authors describe how American Forests conducted "an urban ecological analysis of several U.S. cities to assess urban forest's role in removing and storing carbon"(Moll). They write, "The findings show American Forests' Urban Ecological Analysis can provide local governments and environmental organizations with

information [omitted] fossil fuels" (Moll). The end of the article claims that "carbon storage could increase by 300 million to 600 million tons a year when all the opportunities described above are considered. This is enough to offset somewhere between 20 and 40 percent of the carbon the U.S. emits annually" (Moll). While this statement is drastically overestimated, in 2006, the International Council for Local Environmental Initiatives cited this article in their toolkit for local governments, distributing it to local governments and municipal organizations around the United States. In it, the authors write, "Healthy urban forests can help municipalities achieve goals of environmental, social, and economic sustainability while reducing greenhouse gas emissions and removing carbon from the atmosphere (Local Governments for Sustainability USA). As of April 2022, ICLEI describes itself as:

> "The first and largest global network of local governments devoted to solving the world's most intractable sustainability challenges. Our standards, tools, and programs credibly, transparently, and robustly reduce greenhouse gas emissions, improve lives and livelihoods and protect natural resources in the communities we serve" (Local Governments for Sustainability USA).

It is clear that a network of non-profit organizations and government officials characterize tree planting as an essential form of environmental stewardship to help the environment. But Shaul Cohen questions, "How is it, then, that after more than a century of of environmental advocacy on behalf of the forests, and after more than 125 years of the American Forests organization and Arbor Day, all this advocacy is still necessary, even more so now than before?"(Cohen 160). It would seem that tree planting to help the environment is a narrative that never seems to achieve its goal.

Despite the science proving tree planting to be ineffective as a solution to global warming, the "tree planting message" also continues to thrive in news stories about climate change mitigation strategies. One specific example is attributed to the promotion of Aerial Reforestation in which thousands of saplings are dropped from an aircraft to reforest large swaths of land. According to the Lemelson-MIT academic website,

> "Moshe Alamaro developed a revolutionary method of battling global warming…The method was planting new trees from the air…Alamaro invented an incredibly efficient system. He designed conical canisters made of a starchy biodegradable material, which contain a seedling packed in soil and nutrients. The canisters are dropped from a low-flying plane, so that they hit the ground at 200 m.p.h. and embed themselves in the soil. Then the canisters decompose, and the young trees take root. A large aircraft could drop as many as 100,000 saplings in a single flight; Alamaro's system could plant as many as a million trees in one day" (Massachusetts Institute of Technology).

The write-up continued, "Large-scale reforestation significantly reduces carbon dioxide in the atmosphere, thus counteracting global warming." I emailed Mr. Alamaro to learn more about the method, and in his response revealed that,

> "Aerial forestation for carbon-sequestering from the air is futile and pointless because: Trees don't live forever. Eventually, they die and decay and their content of carbon is dispersed back to the atmosphere; and the momentum (or the force) generated by the falling seedlings is not strong enough to penetrate the ground. There were attempts for aerial dropping of seeds (not seedlings) in Thailand. The only outcome was an increase in rodent and mice population" (Alamaro).

Alamaro's method appears in the 1997 issues of "Popular Mechanics" and "Popular Science" magazines. And later, in 1999, the magazine "Boy's Life" and the newspaper "The Guardian," recognized Alamaro's invention as a genius idea. Today, Ariel Reforestation continues to be

promoted in popular culture as an endeavor that plants thousands of trees to reduce carbon dioxide from the atmosphere even though the method was debunked more than twenty years ago.

My MFA Thesis film *No Time for Trees* aimed to incorporate this research to help unravel the deceptive narrative that tree planting is a viable solution to global warming. The bulk of the narrative is dedicated to presenting the reported benefits of tree planting in relation to fossil fuel emissions and energy use at large. Since this comparison is often left out of advertising for tree planting programs, I wanted to reveal why this comparison is so meaningful for people to understand. I used the expository mode because it "relies heavily on an informing logic carried by the spoken word." (Nichols 122). This mode functions to "provide an account of a subject through commentary and images of illustration (b-roll)" (Nichols 156). My narration emphasizes the specific scientific information related to CO2 emissions and the sequestration potential of trees, while the b-roll illustrates images of trees, cityscapes, greenhouse gas emissions, and ecosystems around the world.

Furthermore, *No Time for Trees* uses the model of investigative reporting, which aims to "provide a fact-based account of a topical issue" (Nichols 156). In these films, "The voice-over commentary seems literally above the fray…The professional commentator's official tone, like the authoritative manner of news anchors and reporters, strives to build a sense of credibility from qualities such as detachment, neutrality, disinterestedness, or omniscience." (Nichols 123) I wanted my narration to remain neutral but derive from an emotional source of concern for the environment. While stating factual information, I choose to emphasize facts that discredit the ability of trees to sequester enough CO2 to put levels within safe parameters for life on Earth.

Ultimately, I decided to present the science clearly and convincingly to argue that tree planting is not a solution to global warming rather than frame the subject around deception.

One strategy I used in *No Time for Trees* was to begin the film as though the narrative would celebrate the importance and beauty of trees and their potential to combat climate change instead of critiquing tree planting as an ineffective form of environmental stewardship. I set up the topic by allowing viewers to validate their preconceived notions about tree planting as beneficial to the environment and then "pulled the rug" out from under this notion. First, I show archival footage of environmental activist Jane Goodall from the World Economic Forum saying that planting trees is something young people can do to make a difference. Next, Grant Domke, a carbon estimation specialist and researcher from the US Forest Service, says trees represent a "carbon pump" that is a "natural climate solution" to offset the emissions in the atmosphere. Domke says, "By sequestering or storing, you know, capturing carbon from the atmosphere through live tree sequestration, this is one way that we can sort of combat the impacts of these sort of economy-wide emissions." And finally, Shaul Cohen, author of *Planting Nature: Trees and the Manipulation of Environmental Stewardship in America*, describes trees as beautiful, diverse, strong, resilient, ancient, and an essential part of the world that we live. Here the film turns the corner. Environmental scientist and author Dr. Erle Ellis, says, "The reason that we have global climate change isn't because the planet doesn't have enough trees." Next, environmental scientist and professor Dr. Stephanie Pincetl describes how planting trees has become a "fetish" to fix a myriad of problems. Next, environmental justice and public policy researcher Dr. Forrest Fleishman warns that the public should be "suspicious" of companies that

promote tree planting programs. And finally, Cohen says the "problems are bigger than our tree planting…so if you tell me by planting a tree that I've helped solve these problems, you're deceiving me." Even though the section of this film began by lauding the ability of trees for their environmental offerings, it ends by "flipping the script" with a warning to viewers that trees might not be as effective as they previously thought.

No Time for Trees is divided into two main parts: Urban Trees and Forest Trees. I used this structure to address the two key types of planting projects. While they both advertise environmental goals, each arena has its unique characteristics. Within the Urban Trees section, urban forestry researcher Dr. David Nowak describes how urban land in the United States occupies about 3.6% of the total land area, even though more than 80% of the population lives in this domain. Of that land, only 39% of the urban land is occupied by tree cover, indicating that only 1% of the US land base is approximately in urban tree cover. This information is essential to help viewers contextualize how small of an area urban trees occupy. It would be impossible for urban trees to mitigate global CO2 emissions in this context, a claim often promoted in urban areas to incentivize tree planting programs. Another aspect of urban tree planting is that tree cover is declining while impervious cover is increasing. Impervious cover means concrete, asphalt, and other waterproof surfaces that absorb heat and increase local temperatures. Heat is the number one weather-related cause of death in the United States and will continue to be so for many years to come. The more impervious surfaces and the less tree canopy coverage has fatal repercussions. This section lands on its biggest revelation when Nowak says that all urban trees in the United States only sequester eight days of US fossil fuel emissions annually. Urban trees

are simply not powerful enough to sequester the amount of carbon dioxide that is emitted in most modern cities.

Within the Forest Trees section, I introduce the idea that deforestation, wildfires, and climate-change-related insect infestations, damage many more trees than are planted every year. In my narration, I reveal that of the world's three tropical rainforests (Amazon, Australian rainforest, and African Congo Basin rainforest), only the Congo has enough standing forest left to remain a robust net carbon sink (Harris). Viewers need to know that even plants within the densest ecosystems are threatened by land-use changes and rising global temperatures that impact their ability to sequester CO2. Next, Dr. Forrest Fleishman discusses how large-scale tree planting initiatives plant monoculture plantations, some of the least effective ecosystems for CO2 emissions. These include eucalyptus and palm trees that are harvested to make consumer products. Furthermore, large-scale tree planting initiatives often plant trees in unsuitable sites resulting in high tree mortality. Finally, while the single act of planting is what makes the news, there is rarely any follow-up by the media to see if the planting program yielded positive results. Andy Stahl, Executive Director of Forest Service Employees for Environmental Ethics, discusses how programs like the Trillion Trees Initiative incorrectly promote the idea that there are large areas on Earth suitable for new trees. Stahl argues that most of these areas are deserts, grasslands, agricultural lands, and places "whose highest and best purpose isn't planting trees." Viewers need to recognize that it is infeasible to plant in areas not naturally home to trees.

Although *No Time for Trees* is less a story about the hegemony of fossil fuel interests than the science of trees and tree planting, both Shaul E. Cohen and Dr. Forrest Fleishman

provide important testimony that situates tree planting in a socio-economic context. Fleishman argues that companies that promote tree planting are often less interested in finding other means of reducing carbon emissions. The film might persuade viewers to think critically about tree planting programs that do not indicate where the trees are planted, what species of trees are being planted, and who is responsible for planting these trees. Companies are irresponsible in advertising their tree planting efforts without disclosing important details that factor into their carbon dioxide reduction goals. The public should be skeptical about companies that promote tree planting to offset their carbon debts while they continue to operate in unsustainable ways.

I decided to end *No Time for Trees* with powerful testimony that speaks to our individual roles within environmental activism and the ethical problems associated with global tree-planting programs. Toward the end of the film, Cohen elaborates that the tree planting discourse,

> "...uses trees to keep us in our place. If you feel like you're all on the same side, and that you're all working toward a common goal, and you're all doing the right thing, and that it's being done at a huge scale because just look at the numbers, then you're not concerned; then you don't challenge the system; then you don't question the recipe of success that gets parcelled out to you in school, and on TV, and in our public institutions, and by the government, and in advertising, and in the products that we consume. And while we're in our place, we keep consuming and the problems that we face continue to get worse and we don't ask the fundamental question, 'What's wrong here?'"

Cohen's words evoke the idea that tree planting is promoted to further capitalistic rather than environmental goals. It is a critical line, told succinctly and persuasively, that helps me express another angle to the tree planting problem beyond science. Lastly, I decide to end the film with the impassioned words of Dr. Forrest Fleishman, who argues,

> "There are [tree planting] programs which are taking land away from poor people who are growing crops to feed their family to plant trees on it; to sequester the

> carbon emissions of wealthy people in the United States, or in Europe, or in East Asia. And I think that there's just a fundamental ethical problem with asking poor people to bear the costs of rich people's pleasure. And that's what we often end up doing with these tree planting programs."

His heartfelt delivery categorizes tree planting as a way for developed societies to outsource the implementation of global warming solutions to less developed areas of the world. This notion wealthy people can avoid changing their lifestyles by enlisting "other people" to sacrifice livelihoods is a hegemonic concept rooted in the desire of fossil fuel companies to obfuscate the damage of climate change from Western societies. Fossil fuel interests spread a deceptive narrative that says the effects of climate change will happen elsewhere. The hegemony offers peace of mind to members of industrial society, even though climate change knows no political boundaries or prioritizes its impact based on socio-economic status.

All in all, the goal of *No Time For Trees* was to present the scientific information about tree planting and the shortcomings of environmental stewardship in a way that was not condescending to viewers. It was essential to maintain a respectful academic tone so viewers could bring what they learned in the film into their social circles for further discussion. It may be hard to accept that something so politically neutral is actually a harmful deflection narrative that benefits fossil fuel interests more than the environment. People want to feel good about doing *something* that makes a difference. "For now, planting trees is not enough, and the partnerships we maintain with nonprofit groups, the government, and industrial America should signal the need for inquiry and concern, rather than serve as an opportunity for self-congratulatory celebration" (Cohen 166). Only until the rate of fossil fuel emissions entering the atmosphere is reduced can we focus on methods to bolster Earth's defense system. In the meantime, the most

effective form of environmental stewardship is ensuring that the right people are elected to office who can direct government resources toward reducing emissions at the source.

PART TWO: HEGEMONIC CONNOTATIONS OF THE PRONOUN "WE"

"Words have no power to impress the mind without the exquisite horror of their reality," wrote fiction storyteller Edgar Allen Poe (Poe). Climate change will take such a devastating toll on the planet that there are often no words to accurately describe what future generations will expect to see in their lifetimes. As of May 2, 2022, atmospheric carbon dioxide emissions are at 420ppm. The effects of warming, even if stabilized at 450ppm, would be substantial, including the extinction of 9–31% of all species and increased heat waves, floods, droughts, and severe weather events (Haight). If warming increases higher than 1.5 degrees Celsius above pre-industrial levels, the environmental problems will likely be everlasting and irreversible (Hoornweg).

On land, warming is very likely to trigger the loss or extinction of species and ecosystems, including those we depend on for agriculture. A diminished food supply can result in starvation and civil unrest (Hoornweg). Melting glacial ice will likely cause sea levels to rise, resulting in the damage or destruction of coastal life and coastal infrastructure around the world. A warmer world will trigger a cascade of problems that will affect every nation's economy. Heat, already the leading weather-related cause of death globally, will rise to high enough temperatures in some parts to force millions of humans to flee their homelands to survive (NOAA).

At sea, warming will very likely cause ocean acidity to increase and oxygen levels to decrease, causing disturbances in marine biodiversity. "Tropical corals are particularly susceptible to the combination of ocean acidification and ocean warming, which would threaten the rich and biologically diverse coral reef habitats" (Doney). The rise in ocean temperatures will also impact the ability of fisheries to provide a food source that, as of 2022, accounts for 17% of

the global production of edible meat (Costello). "Over 90% of seafood consumed in the U.S. is imported, and more than half of the imported seafood comes from aquaculture (fish and shellfish farming)" (Doney). In addition, deceased marine animals will wash up on coastal shores, leading to the spread of bacterial and airborne viruses.

Words are an essential component of sharing information about climate change and enlisting the cooperation of people and groups to meet the extreme challenge of reducing carbon dioxide emissions. However, the fossil fuel hegemony can contaminate even the purest language for environmental activism with connotations of deceptive narratives. Storytellers should be mindful that even the most minor and benign words can work against goals to solve global warming.

In documentary filmmaking, narration is an important convention that helps the storyteller guide the film through its structure. It often acts as a central hub of ideas, providing the springboard from which the filmmaker can delve deeper into topics. Beyond a conduit for information, the narration is also a way for the storyteller to connect emotionally, culturally, and ideologically with viewers. Pronouns provide filmmakers with a wide range of rhetorical abilities that can help establish the narrator's tone and relationship with viewers. For instance, filmmakers can craft their narrator to be an authority figure and speak to viewers as students, using the pronouns "you" and "I." Or, the narrator can be crafted as an equal to viewers, using the pronoun "we" to convey a shared experience. However, connotations of the pronoun "we" in the narration of climate change documentaries can perpetuate hegemonic rhetoric and direct the blame for global warming onto individuals rather than the corporations working hard to sustain their capital interests in fossil fuels.

The 11th Hour (2007), by Writers-Directors Leila Conners and Nadia Conners and Producer/Narrator Leonardo DiCaprio is a deductive climate change documentary that uses interviews, b-roll, and archival news footage to present climate science and warn viewers of global warming's destructive effect on the environment. Unfortunately, while the film is a triumphant example of a film that contextualizes the extent of the global warming problem, there are three examples of narration where the pronoun "we" appropriates language used by the hegemony of fossil fuel interests.

In the first example at 4:24, film narrator Leonardo DiCaprio appears on-screen facing the camera. Speaking directly to the viewer, he asks,

> "If we look for the cause of this planetary destruction, what will we find? The evidence is now clear. Industrial society has caused irreparable damage and our impact is only accelerating. We've lost the last thirty years in the war against global warming. The questions they arise: why aren't we responding? But more importantly, what are the forces that are blocking change?" (The 11th Hour).

DiCaprio's second sentence indicates that the word *we* connotes members of industrial society, which includes both the filmmakers and the film's viewers. By examining the specific nouns, verbs, and pronouns in each sentence, one can discern what this narration, as a whole, is implying. DiCaprio's second sentence indicates *we,* members of "industrial society," "lost the last thirty years in the war against global warming." Next, Dicaprio's fifth sentence, "Why aren't we responding?" indicates *we*, "members of industrial society," have not responded to "the war against global warming." The narration, taken as a whole, implies that: all "members of industrial society" caused "planetary destruction" and "irreparable damage" "thirty years ago" that sparked a "war against global warming." And, despite the damage getting worse, all

members of industrial society have failed to respond to either the damage they caused or the war against global warming.

This piece of narration aligns with the deceptive rhetoric inherent to the fossil fuel hegemony by placing the onus on the public for perpetuating environmental damage. While it is valid that members of industrial society are complicit in burning fossil fuels for personal reasons such as transportation and energy, the "irreparable damage" was caused more by the fossil fuel industry's action and inaction. In 2017, The Carbon Majors Report found that Just 100 companies (all of them within the fossil fuel industry) have been the source of more than 70% of the world's greenhouse gas emissions since 1988 (Heede). These companies used their wealth and power to perpetuate more damage rather than change their practices to benefit the future of industrial society and all life on earth. "Major fossil fuel companies have known for decades that their products—oil, natural gas, and coal—cause global warming. Their own scientists told them so more than 30 years ago" (Union of Concerned Scientists).

> "Instead of heeding the evidence of the research they were funding, major oil firms worked together to bury the findings and manufacture a counter narrative to undermine the growing scientific consensus around climate science. The fossil fuel industry's campaign to create uncertainty paid off for decades by muddying public understanding of the growing dangers from global heating and stalling political action" (McGreal).

Fossil fuel interest manufactured a deceptive narrative in the news media and within other social environments to frame global warming as a problem (or not a problem) that did not warrant a response. Therefore, when *The 11th Hour* was released in 2007, it was problematic for the film to imply there was a "war" against global warming that dated back thirty years. Instead, the narration should clarify that the real "war" *we* were fighting in the past "thirty years," although

unknowingly, was against the hegemony of fossil fuel interests that worked to block ways to reduce emissions.

Members of industrial society, meanwhile, had little choice in alternatives to fossil fuels. It is unfair to blame viewers for "not responding" to the "damage" or the supposed "war against global warming." The hegemony of fossil fuel interests obfuscated the extent of the damage by claiming that climate science was either inaccurate or not comprehensive enough to warrant concern.

> "From 1998 to 2005, Exxon contributed almost $16 million to at least 43 organizations to wage a campaign raising questions about climate change, according to the Union of Concerned Scientists, an environmental activist group. Greenpeace has estimated that Exxon spent more than $30 million in that effort"(Jennings).

Suppose the narration identified these mechanisms of control that kept the public passive and provided more context about the lack of response on the public's part. In that case, viewers might not feel responsible for allowing the damage to go unabated for so many decades.

The second example from *The 11th Hour* that reveals hegemonic connotations of the pronoun "we," begins at 19:39. DiCaprio appears on screen, again facing the camera. Speaking directly to the viewer, he says,

> "While we weren't looking, we've created one of the biggest problems facing all of humanity: climate change. What does it look like when we don't pay attention to the massive amounts of CO2 we dump into the air and water?" (The 11th Hour).

In this example, the connotation of *we* is consistent with the first example from earlier in the film. *We* still connotes members of industrial society, of which the filmmakers and the film's viewers are a subset. In the first example from earlier in the film, DiCaprio's narration indicated

we caused harm and did not respond to it. Here, the narration suggests that *we* were not "looking" when *we* "created one of the biggest problems facing all humanity: climate change." It also indicates *we* were not "paying attention" to the "massive amounts of CO2" *we* dump into the "air and water." However, the implication is unclear if the reason for not paying attention is ignorance, apathy, lack of ability, or due to a known or unknown force. This narration, taken as a whole, implies that: when members of industrial society were not looking and not paying attention, they polluted the environment with CO2 and created climate change.

This second example of narration aligns with the rhetoric of the fossil fuel hegemony because it implies that the public should have recognized the extent of the pollution. However, people of industrial society *were* "looking" very closely at CO2 entering the air and water. Beginning in the 1970s, nearly twenty years before *The 11th Hour* was released, many climate scientists (including the ones working for the fossil fuel companies) started "looking" at the impact of increased levels of CO2 in the air and water. And later, in the 1980s, climate scientists testified to the United States Congress about their observations (Kolbert). They asked lawmakers to pay attention and prepare strategies to deal with fossil fuel emissions.

Furthermore, members of industrial society were not "looking" or "paying attention" to global warming because most of the evidence of climate change did not manifest within industrial society on a visible level. Even in 2022, in a general sense, members of industrial society do not see the signs of change or the environmental damage that scientists discern from research conducted over many years that often takes place within specific ecosystems and parts of the world that are out of reach for most of the public.

> "Even for the majority of U.S. adults who believe that global warming is real, the abstract and complex nature of the problem can make it challenging to fully

> understand or care about climate change at a visceral level. One difficulty is that other environmental problems are more visible. People can see forests being cut down, a mountain that is being strip mined, or an oil spill in the ocean. But carbon dioxide in the atmosphere is invisible. We can only see graphs or measurements of carbon dioxide levels rising over time" (Graef).

It is problematic for the narrative to imply that the public was responsible for a deeper level of observation beyond what they saw "in their own backyard," read in the newspaper or heard on television. And as stated earlier, the fossil fuel industry spreads propaganda and deflection narratives within social and cultural environments to obfuscate climate science.

> "[Exxon] placed advertisements in major American newspapers to sow doubt. One in the New York Times in 2000, under the headline 'Unsettled Science', compared climate data to changing weather forecasts. It claimed scientists were divided, when an overwhelming consensus already backed the evidence of a growing climate crisis, and said that the supposed doubts meant it was too soon to act" (McGreal).

Atmospheric CO2 emissions remained constant as a direct result of the industry's ability to keep the public suspicious about the integrity of climate science. Suppose the narration indicated how the fossil fuel industry's intentional obfuscation kept the public focusing on the legitimacy of climate science rather than reduction solutions. In that case, viewers might understand that even "looking" or "paying attention" was not enough to address the global warming problem.

Following this second narration example, this paper should note that the film does address the greed of fossil interests through interviews:

> 40:48 - "We have a constitution that empowers the corporate few to make decisions that trump the majority." -Tom Lindzey, Community Environmental Legal Defense Fund.
>
> 41:04 - "The reality is that we have very responsive political leaders that just [respond] to wealth and to money and to corporate power…people say gee, why aren't politicians responding to the global climate crisis?...Because they are

> responsive to a higher power, unfortunately, and right now that higher power is the fossil fuel industry." -Michel Gelobter, President of Redefining Progress
>
> 42:24 - "On the issues of climate change and environment, the political system has failed us. It's not, first and foremost, a crisis of technology, it isn't even a crisis of public opinion…it's that there is money, too much money, in the political system. -David Orr

While these statements help viewers contextualize the entire problem of global warming, the narration later in the film reverts to using a hegemonic connotation of the pronoun "we." For instance, at 59:04, DiCaprio says,

> "Because we have waited, because we've turned our backs on nature's warning signs, and because our political and corporate leaders have consistently ignored the overwhelming scientific evidence, the challenges we face are that much more difficult" (The 11th Hour).

Despite the interview testimony from the film's participants, the return of this usage reveals that the filmmakers did not recognize the problematic connotation of the pronoun "we." This oversight is primarily a testament to the power of hegemony.

The third example from *The 11th Hour* that reveals hegemonic connotations of the pronoun "we," comes at 59:33. Film narrator Leonardo DiCaprio appears on screen, again facing the camera. Speaking directly to the viewer, he says,

> "But will our pivotal generation create a sustainable world in time? What will guide this massive change? And does nature hold the answers we need to help restore our planet's resources, protect our atmosphere, and therefore help all life survive?" (The 11th Hour).

The first and second sentences provide context. The third sentence indicates that "nature" may hold the "answers" *we* "need" to help the "environment" and "all life on earth." In total, the narration implies that members of industrial society need answers to combat global warming because none have been found, that society has not looked to nature for answers, and that the

public does not know (but needs to know) how to restore the planet's resources. In other words, this narration implies that if members of industrial society investigate nature, they may finally find ways to reduce emissions and revert environmental damage.

This third example aligns with the rhetoric of the fossil fuel hegemony by deflecting attention away from the only solution to environmental damage: reducing fossil fuel emissions. Suggesting that nature holds the answers to the climate crisis tells viewers that *we* don't know how to fix global warming. And yet, since the 1990s, the scientific community was clear on the understanding that global warming could be stalled by reducing the rate at which greenhouse gases were entering the atmosphere. Suppose the narration focused solely on emissions reduction strategies to "restore our planet's resources, protect our atmosphere, and…help all life on Earth" (The 11th Hour). In that case, viewers would understand that there was no need to look elsewhere for help in dealing with the climate crisis.

Suggesting that "nature" is a separate domain from industrial society is a hegemonic concept designed to bifurcate how we assess, or triage, damage to all life on Earth. Industrial society is an inseparable part of nature. Therefore, suggesting that the impacts of global warming reside in nature rather than industrial society downplays how climate change will irrevocably harm human civilization. If the narration avoided framing damage as natural or unnatural, the filmmakers would guide viewers to accept a unified perspective of the natural world in which they are inseparable.

Rhetoric that directs members of industrial society to create a "sustainable world" while simultaneously permitting them to continue to burn fossil fuels is a hegemonic narrative that deflects attention away from the need to modify the existing system dramatically. Overhauling

industrial society into something entirely new is both impossible to do physically and unreasonable in the time needed to keep atmospheric CO2 below 450ppm. Preventing global warming from happening *again* will require a monumental change and depend on sustainable innovations. Even so, any expectations for sustainable infrastructure or energy systems before reducing fossil fuel emissions are expectations influenced by the hegemony of fossil fuel interests. If the narration highlighted sustainable innovations as tools generations could use in the future after reducing fossil fuel emissions, viewers would remain focused on the only real solution to global warming. Viewers need to understand the scope of global warming. Still, it is equally crucial for filmmakers to reveal that no other strategies besides reducing fossil fuel emissions are practical.

The 11th Hour has profoundly contributed to the public's knowledge about climate change. However, since the nature of hegemonic rhetoric is subversive, it is evident from these examples that even the most basic words may work against the film's environmental goals. Filmmakers should strive to have a consistent and singular connotation of the pronoun "we" throughout their films. The connotation should also separate fossil fuel interests from the public. The more filmmakers indicate the fossil fuel industry's systems of control and deceptive narratives, the more effective climate change documentaries will be at rallying support for global policy solutions and penalties for the world's biggest greenhouse gas emitters.

PART THREE: A VISUAL HISTORY OF DECEPTION

Merchants of Doubt (2014) by director Robert Kenner is an inductive climate change documentary designed to reveal why solutions for global warming are not being implemented. The film's goal is to expose the hegemony of fossil fuel interests and unravel the industry's comprehensive history of spreading deceptive narratives through the news media. The film is based on the book *Merchants of Doubt: How a Handful of Scientists Obscured the Truth on Issues from Tobacco Smoke to Global Warming* by Naomi Oreskes (who appears throughout the film) and Erik M. Conway. Oreskes is a Professor of History and Science Studies at Harvard University in Cambridge, Massachusetts. Conway is a historian at NASA's Jet Propulsion Laboratory at the California Institute of Technology in Pasadena, California. While the book lays out its argument through written evidence, the film is tasked with sourcing as much visual evidence as possible to give viewers visible proof of the industry's deception.

Since climate science, factual information, and archival footage alone do not make a compelling argument, Kenner uses a wide array of rhetorical strategies to present evidence persuasively. Film historian Bill Nichols indicates two types of rhetorical evidence documentary filmmakers use to reveal either truth or the impression of truth. The first type is inartistic evidence. This includes "facts that lie beyond dispute" and "outside the right of orators or filmmakers to invent or create, although they do lie within their power to evaluate and interpret" (Nichols 58-59). The second type is artistic evidence which gives viewers "the *impression* of conclusiveness or proof" and is "a product of the filmmaker's inventiveness" (Nichols 59). Archival footage and interviews can be used rhetorically as inartistic or artistic evidence. Other rhetorical techniques used in *Merchants of Doubt* include graphics, editing, music, and metaphor.

"Skill in the use of the rhetorical techniques for creating credible, convincing, compelling accounts depends on knowing how to enlist an audience's preexisting values and beliefs for specific ends" (Nichols 72). How Kenner presents the evidence determines how viewers accept the integrity of his arguments.

Merchants of Doubt reveals how fossil fuel interests spread propaganda through scientific front groups and published materials. In the film, science historian Naomi Oreskes says, "...It's all about distraction, it's all about confusion, it's all about preventing you from looking where the action really is, which is in the science." Through interviews, the film argues that scientific front groups published reports formatted to look identical, page for page, to actual scientific reports. The film presents reports situated side by side on the screen. The one on the left was published by the National Oceanic and Atmospheric Administration, while The Cato Institute published the one on the right. The film reveals that The Cato Institue was one of many fossil fuel interests that spread false science and information about climate change (Merchants of Doubt). Kenner uses an editing effect to turn each page of the reports in unison. The viewer evaluates how each report is starkly similar in font, color, layout, and nearly every other detail. The Cato Institue report is clear and convincing evidence of fraud and appropriation to the audience. Even though the film only presents this one example of propaganda, inartistic evidence and rhetorical techniques help the filmmakers convince viewers that scientific front groups spread enough propaganda through published materials to warrant it being a widespread problem.

Merchants of Doubt reveals how the news media perpetuates deceptive narratives that stall global efforts to reduce the rate of emissions entering the atmosphere. In her interview,

science historian Naomi Oreskes says that a political front group released The Oregon Petition in the days leading up to the Kyoto negotiations. According to the group, the document contained signatures of more than 31,000 climate scientists who rejected the mainstream view that global warming is harming the planet. Later, however, the petition was publicly discredited by the leading science academies when they discovered that the names of celebrities, alive and dead, appeared as signatures (Merchants of Doubt). The Oregon Petition weakened negotiations in Kyoto and could have been a critical element that contributed to unsuccessful negotiations. Oreskes says,

> "So they give you the impression that it is a very big network with lots and lots of scientists, but if you actually look closely you'll see that it's actually a very small number of people, really just a handful…It's kind of an amazing accomplishment if you think of it. That such a small group of people have had enormous impact on public opinion so that more than half the American people think that the science isn't settled."

She also notes that "experts" from the front groups continued to reference this document in media appearances to spread the narrative that there was discord within the scientific community.

To show proof of Oreskes' allegations, the filmmakers present a montage of archival clips. The first clip is from a Fox News national broadcast where the news anchor says, "more than 31,000 scientists signed a petition…." Next, James Taylor from the Heartland Institute appears in an unidentified clip, saying, "More than 31,000 scientists." Next, in a clip from Book TV on C-SPAN2, Steve Milloy, identified as the author of the book "Green Hell," remarks, "And more than 31,000 American scientists rejected global warming alarmism." The backdrop behind Milloy shows The Heritage Foundation logo, implying that it was a sponsor of Milloy's talk.

The filmmakers use rhetorical strategies to give viewers the *impression* that deception reached a broad international audience through the news media. Even so, Kenner's evidence is limited. The testimony of two experts, combined with *one* example from a national news cable network, *one* example from an unknown source, and *one* example from a public television network that receives a very tiny viewership, should not be enough to make a convincing argument. However, by using archival footage as inartistic evidence and the rhetorical technique of editing to present this archival footage, his limited evidence is persuasive enough for viewers to believe that deceptive narratives permeate the news media.

Merchants of Doubt reveals how the fossil fuel industry uses propaganda to influence the American public's convictions about climate science and block legislative measures to limit fossil fuel emissions. With the help of interviews, archival footage, and editing, the film gives viewers the impression that a powerful group, Koch Industries, used propaganda to make the public fear the repercussions of government regulations enough to vote against politicians intent on changing the system. To make this argument clear and convincing, the filmmakers first establish where the propaganda came from, second who spread the propaganda and for what purpose, and third how the propaganda affected a government election.

The filmmakers establish where propaganda for the fossil fuel industry originated. First, John Passacantando, former director of Greenpeace USA, explains how Koch Industries created a political front group called Americans for Prosperity. Passacantando describes the coal and oil companies within the Koch Industries conglomerate as "some of the biggest polluters in the country" and "have received some of the largest fines." Next, Stanton Glantz, an expert on

deception tactics used by the Tobacco Industry, says, “They needed an army of people to fight against regulation in the name of freedom.” Kenner’s edit is a rhetorical strategy to establish a continuity of thought from two different sources, which may or may not have been both referring to Koch Industries or Americans for Prosperity. Kenner gives viewers the *impression* that both individuals were on the same train of thought. Together they argue that the fossil fuel industry could no longer deny that climate change was real and caused by human activities. Instead, American for Prosperity embarked on a campaign across the United States with the message to the public that any limits to fossil fuels would also be limits to civil liberties. Clean energy would mean lost jobs, higher taxes, and less freedom. Therefore, the film establishes that “freedom” propaganda originated with Koch Industries, a wealthy, powerful, and influential fossil fuel interest.

The filmmakers establish why Americans For Prosperity spread propaganda. Filmmakers are on location with Tim Phillips, President of Americans for Prosperity, filming him sitting in the driver's seat of his parked car at a gas station pump. A disembodied interviewer asks Phillips, “Do you try to figure out if the science is real or not?” Phillips replies, “No, we’re on the economic side of things. We study what [government policies on climate chnage] are going to do to the American people in the name of global warming.” The next part of Phillips’ statement is a triumph for *Merchants of Doubt*. It shows how documentary films have the power to capture unrehearsed and often shocking words from interviews. Comments that, otherwise, would never have been said in an official public statement. Phillips candidly explains:

> "For a long time it was just *An Inconvenient Truth* and all these polar bears that seem to be drowning and these horrible things that seem to be happening. And a lot of Americans said 'Gosh! Well that seems like a bad thing. But then through the education efforts of a lot of groups like Americans for Prosperity and others, Americans began going, 'Well, wait a minute. I'm going to be paying more for everything and it means a little bit less freedom.' I think the American public has moved our way. The polls confirm that."

While this is only one statement from one representative of a political front group, this interview sound-byte is powerful enough to give viewers the *impression* that Americans for Prosperity's only purpose was to maintain the stats quo economic structure.

The filmmakers establish how Americans for Prosperty's propaganda affected a government election in the United States. In his interview for *Merchants of Doubt*, Bob Inglis, a six-time Congressman from South Carolina, says he "represented the reddest district in the reddest state in the nation." He was "a complete denier" of global warming when he was first in Congress. But while working on the science committee, he went to Antarctica. There, climate scientists showed him a core from the ice. He saw firsthand how there was an "uptick" in carbon dioxide levels after the industrial revolution. Kenner shows still images of Kenner in Antarctica, standing beside climate scientists and observing data equipment. "The chemistry is real clear," Inglis says. Upon his return, Inglis made a statement to the US House of Representatives. Kenner shows archival footage from C-SPAN of this speech as inartistic evidence but does not indicate the date it originally aired. Inglis says to the House, "What I'd like to say tonight is that there is a need to act and to come together and find a solution that breaks our addiction to oil, that creates new energy jobs, and that cleans up the air." Kenner has submitted an excellent example of a politician who changed his beliefs about climate science and rededicated himself to enacting political solutions for global warming. But how will his constituents react?

Kenner uses archival footage as artistic evidence to establish a connection between the Americans for Prosperity propaganda and voters for Bob Inglis. The film returns to Tim Phillips, President of Americans for Prosperity, still sitting in his car at the gas station pump. He says, "We've run TV ads in Republican States with Republican senators like South Carolina." Rhetorically, this statement helps viewers associate the Americans For Prosperity "freedom" propaganda with both South Carolina and politicians. The editing then cuts to cell phone (or low-quality camera) footage from one (or several) "town hall" meetings in South Carolina. The clips seem to show Inglis speaking to a group of 50-100 people. Many people in the audience appear to be angry and yelling. Some voices are heard saying, "Sit down!" Then, over a clip showing someone putting their thumbs down in the air, a loud "Boo!" is heard coming from the back of the room. Closer shots of Inglis show him holding his hand up, apparently trying to calm down the crowd. This footage gives viewers the *impression* that Inglis is speaking about global warming and the *impression* the audience is rejecting his support of climate science. The footage, however, could have been from a forum about an entirely different subject matter. When edited together, the interview of Phillips in his car and the footage of Inglis speaking to a crowd give *Merchants of Doubt*'s viewers the *impression* that Inglis' angry audience in South Carolina saw the Americans For Prosperity TV ads, and the *impression* the propaganda persuaded the public to reject the validity of climate science that Inglis was promoting.

Despite a persuasive presentation of visual evidence throughout the film to expose the deceptive tactics of the fossil fuel industry, *Merchants of Doubt* does succumb to a rather odd hegemonic narrative at the end of the film. The film's conclusion considers that maybe society will never dismantle the hegemony and that climate scientists, politicians, and the public will

continue to fail at trying to implement solutions. Therefore, the film argues that faith may be the only solution to global warming.

Easing into the film's final thoughts, Bob Inglis says in his soft Southern accent, "To be in this situation where those fossil fuels are imperiling our future and future generations, and we are not accountable for that, that really becomes a moral problem." This mention of morality does service the film by broadening its characterization of fossil fuel interests beyond just *deceptive*. Now, fossil fuel interests are also *immoral.* Inglis elaborates that inaction in solving global warming means "we didn't have enough faith in the future as it could be brought about. So we just gave up. We couldn't rise to higher things." His words imply a hegemonic notion that the public's lack of faith is what enabled atmospheric fossil fuel emissions to remain at a steady rate. Inglis' words suggest that one's strong faith may bring about a future where fossil fuel emissions no longer harm the planet. This assessment is problematic because the fossil fuel industry wants the public to lose hope in changing the status quo. The hegemony is designed to convince individuals they can continue to burn fossil fuels while simultaneously having faith that climate change will be solved by the experts, some future technology, or a divine entity.

Nearly eight years after *Merchants of Doubt* was released, the rate of fossil fuel emissions entering the atmosphere remains, more or less, unchanged (EPA). Despite this unfortunate reality, the authors of the book and the filmmakers of the documentary submitted a different way the public could rationalize the problem of global warming. They used a historical framework to illustrate why climate change solutions were not being implemented. While the book *Merchants of Doubt* includes substantial evidence of the industry's comprehensive history of deception, visual evidence of this deception seemed limited for the filmmakers. Yet, they used archival

footage, interviews, and editing rhetorically to reveal how fossil fuel interests steered public perceptions about climate change and stalled political efforts to reduce emissions. While the film's conclusion is an unfortunate end to a vital climate change documentary, the film does help viewers think critically about stories they hear in the news media or within publications that skew climate science to favor the continued use of fossil fuels. If storytellers can assist the public in seeing through deceptive narratives, perhaps more focus will go toward electing political leaders to enact legislation that reduces emissions from the source.

CONCLUSION

Atmospheric carbon dioxide concentrations are now higher than in the last 3 million years. At current emission rates, unless there is very rapid decarbonization of the world's energy systems, damage to the world's ecosystems will be unstoppable. If the rate of fossil fuel emissions can be reduced in time to prevent permanent and irreversible damage to Earth's ecosystems, it is vital for storytellers to use their platforms and reach to dismantle systems of cultural and ideological control that inhibit substantive change. Whether it is revealing ineffective environmental stewardship programs, using narration that directs blame away from individuals and toward the fossil fuel industry, or exposing how deceptive propaganda in the news media shapes public convictions, documentarians can dismantle dangerous narratives that uphold the wealth and power of fossil fuel interests. Other than getting involved with government, voting, and pressuring leaders to act, there are no effective ways for young people to rectify a problem that will primarily affect their lives. Documentaries, however, will show future generations that storytellers tried to do their part in changing the system. Moreover, as the hegemony of fossil fuel interests continues to evolve, visual storytellers can help individuals escape the grip of deceptive narratives and retaliate against the fossil fuel industry with their own stories of power and survival.

REFERENCES CITED

Alamaro, Moshe. Personal email, 6 Nov. 2019.

Arbor Day Foundation. “Tree Facts.” Arbor Day Foundation, 26 April 2022, https://www.arborday.org/trees/treefacts/

Buis, Alan. “Examining the Viability of Planting Trees to Help Mitigate Climate Change.” NASA, 7 November 2019, https://climate.nasa.gov/news/2927/examining-the-viability-of-planting-trees-to-help-mitigate-climate-change/

Cohen, Shaul E. *Planting Nature: Trees and the Manipulation of Environmental Stewardship in America*, Berkeley: University of California Press, 2004.

Cole, Nicki Lisa, Ph.D. "What Is Cultural Hegemony?" ThoughtCo, 28 Aug. 2020, https://www.thoughtco.com/cultural-hegemony-3026121.

Costello, C., Cao, L., Gelcich, S. et al. The future of food from the sea. Nature 588, 95–100 (2020). https://doi.org/10.1038/s41586-020-2616-y

Domke, Grant M.; Walters, Brian F.; Nowak, David J.; Smith, James, E.; Ogle, Stephen M.; Coulston, J.W.; Wirth, T.C. 2020. Greenhouse gas emissions and removals from forest land, woodlands, and urban trees in the United States, 1990-2018. Resource Update FS-227. Madison, WI: U.S. Department of Agriculture, Forest Service, Northern Research Station. 5 p. https://doi.org/10.2737/FS-RU-227.

Doney, S., A. A. Rosenberg, M. Alexander, F. Chavez, C. D. Harvell, G. Hofmann, M. Orbach, and M. Ruckelshaus, 2014: Ch. 24: Oceans and Marine Resources. *Climate Change Impacts in the United States: The Third National Climate Assessment*, J. M. Melillo, Terese (T.C.) Richmond, and G. W. Yohe, Eds., U.S. Global Change Research Program, 557-578. doi:10.7930/J0RF5RZW.

Eisenman, Theodore Stephen, "Making Meaning of Urban Greening in the Anthropocene" (2015). Publicly Accessible Penn Dissertations. 1051. https://repository.upenn.edu/edissertations/1051

EPA, Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2020. U.S.

Environmental Protection Agency, EPA 430-R-22-003, https://www.epa.gov/ghgemissions/draft-inventory-us-greenhouse-gas-emissionsand-sinks-1990-2020.

Graef, Dana J. “Can We “See” Climate Change?” Sapiens, 19 October 2017, https://www.sapiens.org/column/the-climate-report/climate-change-evidence/

Haight, Robert G.; Bluffstone, Randall; Kline, Jeffrey D.; Coulston, John W.; Wear, David N.; Zook, Kate. 2020. “Estimating the Present Value of Carbon Sequestration in U.S. Forests, 2015–2050, for Evaluating Federal Climate Change Mitigation Policies.” Agricultural and Resource Economics Review. 49(1): 150-177. https://doi.org/10.1017/age.2019.20.

Hair, Dwight and Neil Sampson. “Reducing Carbon by Increasing Trees American Forests,” vol. 102 no. 3, 1996.

Harris, Nancy; Gibbs, David. “Forests Absorb Twice As Much Carbon As They Emit Each Year.” World Resources Institute, 21 January 2021, https://www.wri.org/insights/forests-absorb-twice-much-carbon-they-emit-each-year

Heede, Richard. *Carbon Majors: Accounting for carbon and methane emissions 1854-2010 Methods & Results Report*, ISBN 978-3-659-57841-0, OmniScriptum, Riga, 148, 2019.

Hoornweg, Daniel A., and Urban Research Symposium. *Cities and Climate Change Responding to an Urgent Agenda*. World Bank, 2011, https://openknowledge.worldbank.org/handle/10986/2312

IPCC, 2018. 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 [Masson-Delmotte, V., P. Zhai, H.-O. Pörtner, D. Roberts, J. Skea, P.R. Shukla, A. Pirani, W. Moufouma-Okia, C. Péan, R. Pidcock, S. Connors, J.B.R. Matthews, Y. Chen, X. Zhou, M.I. Gomis, E. Lonnoy, T. Maycock, M. Tignor, and T. Waterfield (eds.)]. In Press.

Jennings, Katie; Grandoni, Dino; Rust, Susanne. “How Exxon went from Leader to Skeptic on Climate Change Research.” The Los Angeles Times, 23 October 2015, https://graphics.latimes.com/exxon-research/

Kolbert, Elizabeth. “Listening to James Hansen on Climate Change, Thirty Years Ago and Now.” The New Yorker, 20 June 2018, https://www.newyorker.com/news/daily-comment/listening-to-james-hansen-on-climate-change-thirty-years-ago-and-now

Local Governments for Sustainability USA. “Talking Trees: An Urban Forestry Toolkit for Local Governments.” ICLEI’s Urban Forestry Toolkit for Local Governments, Nov. 2006, https://www.milliontreesnyc.org/downloads/pdf/talking_trees_urban_forestry_toolkit.pdf

Local Governments for Sustainability USA. “Who We Are.” Local Governments for Sustainability USA, 26 April 2022, https://icleiusa.org/about/who-we-are/

Lindsey, Rebecca. “Climate Change: Atmospheric Carbon Dioxide.” Climate.gov, 7 October 2021, https://www.climate.gov/news-features/understanding-climate/climate-change-atmospheric-carbon-dioxide

Mann, Michael E. *The New Climate War: The Fight to Take Back the Planet*. First edition. New York, NY: PublicAffairs, Hatchette Book Group, 2021.

Massachusetts Institute of Technology. “Moshe Alamaro Ariel Reforestation.” Lemelson-MIT, April 26, 2022, https://lemelson.mit.edu/resources/moshe-alamaro

McGreal, Chris. “Big Oil and Gas Kept a Dirty Secret for Decades. Now they May Pay the Price.” The Guardian, 30 June 2021, https://www.theguardian.com/environment/2021/jun/30/climate-crimes-oil-and-gas-environment

Merchants of Doubt. Directed by Robert Kenner. Participant. 2014.

Moll, Gary; Kollin, Cheryl. *American Forests;* Summer 1996; 102, 3; ProQuest pg. 26

Nichols, Bill. *Introduction to Documentary*. Third Edition. Bloomington, Indiana. Indiana University Press, March 2017.

Nietzsche, Friedrich W, and R J. Hollingdale. *Human, All Too Human*. Cambridge: Cambridge University Press, 1996.

NOAA. “Extreme heat: A resource guide for reporters and media.” National Oceanic and

Atmospheric Administration, 24 August 2021, https://www.noaa.gov/media-advisory/extreme-heat-resource-guide-for-reporters-and-media

Nowak, David J. 1993. Atmospheric carbon reduction by urban trees. Journal of Environmental Management. 37: 207-217.

Nowak, David J.; Crane, Daniel E. 2002. Carbon storage and sequestration by urban trees in the USA. Environmental Pollution. 116(3): 381-389. https://doi.org/10.1016/S0269-7491(01)00214-7.

"Plant a Tree With John Denver." *YouTube*, uploaded by CAL FIRE. 9 March 2012. https://www.youtube.com/watch?v=9QW_64soK9Y.

Poe, Edgar Allan. *The Narrative of Arthur Gordon Pym of Nantucket*. New York: Random House, Inc., 2002.

Roman, Lara A. 2014. "How Many Trees Are Enough? Tree Death and The Urban Canopy." Scenario Journal 4 (Spring): Online version (8).

Rust, Susanne; Xia, Rosanna. "State accuses Exxon Mobil of Deceiving Public, Perpetuating 'Myth' of Plastics Recycling." The Los Angeles Times, 28 April 2022, https://www.latimes.com/environment/story/2022-04-28/california-blames-exxonmobil-for-plastic-pollution-crisis.

Safford, H.; Larry, E.; McPherson, E.G.; Nowak, D.J.; Westphal, L.M. "Urban Forests and Climate Change." U.S. Department of Agriculture, Forest Service, Climate Change Resource Center, August 2013, https://www.fs.usda.gov/ccrc/topics/urban-forests

Silvera Seamans, Georgia. 2013. "Mainstreaming the Environmental Benefits of Street Trees." Urban Forestry & Urban Greening 12 (1): 2–11.

The 11th Hour. Directed by Leila Connors and Nadia Connors. Appian Way. 2007.

The Story of Plastic. Directed by Deia Schlosberg. Pale Blue Dot Media. 2019.

Union of Concerned Scientists. "Holding Major Fossil Fuel Companies Accountable for Nearly 40 Years of Climate Deception and Harm." Union of Concerned Scientists, 22 March 2016,

https://www.ucsusa.org/resources/holding-major-fossil-fuel-companies-accountable

Vose, J.M., D.L. Peterson, G.M. Domke, C.J. Fettig, L.A. Joyce, R.E. Keane, C.H. Luce, J.P. Prestemon, L.E. Band, J.S. Clark, N.E. Cooley, A. D'Amato, and J.E. Halofsky, 2018: Forests. In Impacts, Risks, and Adaptation in the United States: Fourth National Climate Assessment, Volume II [Reidmiller, D.R., C.W. Avery, D.R. Easterling, K.E. Kunkel, K.L.M. Lewis, T.K. Maycock, and B.C. Stewart (eds.)]. U.S. Global Change Research Program, Washington, DC, USA, pp. 232–267. doi: 10.7930/NCA4.2018.CH6