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Tracing Climate Change Denial in the United States and Looking for Impacts on the United States' Science Diplomacy

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Abstract

This paper traces climate change denial in the United States beginning with its emergence in the 1990's. I elucidate its origins, several related facets of the denial narrative, the underlying strategies and tactics, the actors involved, messaging and transmission, and reception by the American public. After considering the state of affairs of the United States internationally with respect to climate change, I examine the research question of whether there is evidence of climate change denial in the United States' exercise of science diplomacy, utilizing the tripartite framework for science diplomacy set out by the American Association for the Advancement of Science and the Royal Society. I find that efforts that fall under science *for* diplomacy and diplomacy *for* science show some positive outcomes while science *in* diplomacy seems to carry the denial narrative with it, producing poor results.

Acronyms

AAAS	American Association for the Advancement of Science
AFP	Americans for Prosperity
ALEC	American Legislative Exchange Council
CAFE	Corporate Average Fuel Economy
CEI	Competitive Enterprise Institute
CEQ	Council on Environmental Quality
CFACT	Committee for Constructive Tomorrow
CHC	Cooler Heads Coalition
COP	Conference of Parties
CTT	Conservative Think Tank
EPA	Environmental Protection Agency
GCC	Global Climate Coalition
GCF	Green Climate Fund
ICE	Information Council on the Environment
IPCC	Intergovernmental Panel on Climate Change
ITER	International Thermonuclear Experimental Reactor
NGO	Non-Governmental Organization
UNFCCC	United Nations Framework Convention on Climate Change

Introduction

Whether one approaches from an ecosystem services standpoint where the concern is with the economic value that can be generated from our natural resources or from a perspective of stewardship and responsibility where environmental preservation has an ethical basis, the condition and quality of our natural environment matters. To discuss that quality requires research, assessments, measurements, modeling, and analysis: in other words, the practice of science. Although all studies can be conducted and their metrics presented and explained in varying ways depending on the story being told, an ongoing battle premised on science and scientists is being waged on the subject of climate change. Despite a clear consensus among 97% of peer-reviewed, published climate scientists that climate change is real and caused by human activities (Cook, et al. 2016) there persists in the American dialogue a narrative of denial that is not seen around other environmental topics like around visible pollution, deforestation, or biodiversity loss. This denial of climate change is strategically based on a claimed lack of agreement among experts on the scientific data underlying climate change studies and models. The mostly artificial discord is the product of a scheme carefully orchestrated by various parties with vested interests and has showed remarkable staying power since it originated in the early 1990s. It has evolved over time, in its first iteration questioning the existence of climate change, then doubting the anthropogenicity, and most recently arguing that the predicted impacts are overestimated, all incarnations claiming a lack of consensus in the scientific community and boiling down to the same argument: that reaction is unfounded and therefore unnecessary.

The environmental protection and sustainability movements are rooted in science, arguably beginning with marine biologist Rachel Carson's 1962 book Silent Spring that brought public attention to detrimental side effects witnessed from the indiscriminate use of pesticides in the United States. As time went on scientific methods, instrumentation, and modeling have improved, more studies have been published, and awareness of the

changes occurring in the environment has grown. Although a gradual increase in global temperatures is not noticeable to the average person the same way dead birds on their property would be, the combination heatwave and drought of 1988, and simultaneous testimony and media coverage of climate scientist James Hansen to the US Congress on the reality of climate change served to capture public attention. Hansen explained that his agency NASA believed with 99 percent certainty that the observed warming was due to the greenhouse effect, which was already known to be perpetuated by human usage of fossil fuels, which release greenhouse gasses when they are burned. This was not an entirely new revelation, though, as the science had been piling up for decades and Hansen himself had given much the same testimony before congress the prior year.

The attribution of climate change to human activity can find starting points as far back as 1896 when Swedish chemist Svante Arrhenius connected increasing atmospheric levels of carbon dioxide to the industrial revolution (Arrhenius 1908). A 1957 paper by oceanographer Roger Revelle and chemist Hans Suess contributed the significant discovery that the assumption that atmospheric carbon dioxide would simply be absorbed by the oceans was a bad one and generated the famous quote “Human beings are now carrying out a large scale geophysical experiment of a kind that could not have happened in the past nor be reproduced in the future” (Revelle and Suess 1957). The full implications weren’t realized at that time, however, and it was another two years until Swedish meteorologists Bert Bolin and Erik Eriksson elaborated on the significance, warning of radical climate effects possible and assuming increasing, rather than steady, emissions. Carbon dioxide monitoring entered the picture in the late 1950’s and over the next decade the first climate models were built utilizing this data. As the methodology on gathering atmospheric carbon dioxide measurements was refined and data from monitoring stations was combined with that from ancient air retrieved from ice cores it was confirmed that levels of carbon dioxide were rising, and at a faster rate than ever seen before. Scientists from different disciplines began to cooperate on climate research and knowledge grew steadily, accompanied by similar advances in ozone layer studies.

Despite various reports raising alarm bells in the ‘70s and ‘80s, it wasn’t until the concurrent events of the summer of 1988 that the topic of climate change captured the public’s focus.

It is to be expected that as new knowledge is produced it will be subject to scrutiny, especially from those who consider conclusions drawn from it to be undesirable. Indeed, Galileo drew the ire of the Catholic Church in the early 1600’s for publishing his heretical beliefs that the earth was not the center of the universe and was only cleared over 350 years later. Global warming (in this paper used interchangeably with climate change) and its attribution to human activities has massive implications so it is unsurprising and appropriate that this determination was initially put under the magnifying glass. While the case for climate change was built in the 60’s and 70’s and finally garnered mainstream attention the summer of 1988, the defense began to appear in the early 1990’s. Its first embodiment was disputing the existence of warming at all, positioning temperature readings from satellites that showed no warming against those from ground monitoring stations that did. By 2000 however, a report by the National Academy of Sciences proved that the satellite readings hadn’t been adjusted to account for orbital changes and in fact their data did show warming and at a higher than historical rate. As this evidence became incontrovertible global warming was begrudgingly accepted but man’s causal link was rejected, with climate cycles pointed to for support. The latest phase of the denial metamorphosis is that climate change may all be true but the severity is being blown out of proportion and it’s an issue not worthy of significant attention, efforts, or funding.

The Intergovernmental Panel on Climate Change (IPCC), itself established in 1988 with a mission of assessing the best of the available research on climate change, has issued five assessment reports to date, each with increasingly confident attribution of climate change to human activity. The unambiguous conclusion reached in the most

recent 2013 report[1]: "science now shows with 95 percent certainty that human activity is the dominant cause of observed warming since the mid-20th century" (Stocker 2013). If history is an indicator, in time the predicted outcomes of climate change will also gain broad acceptance but for now, even with seeming mountains of evidence and consensus, the denial persists. In this paper I will trace climate change denial in the United States beginning with its emergence in the 1990's. I elucidate its origins, several related facets of the denial narrative, the underlying strategies and tactics, the actors involved, messaging and transmission, and reception by the American public. After considering the state of affairs of the United States internationally with respect to climate change, I examine the research question of whether there is evidence of climate change denial in the United States' exercise of science diplomacy. For the conceptualization of science diplomacy, the nexus of diplomacy and science, scientists, and or scientific institutions, I utilize the tripartite framework for science diplomacy set out by the American Association for the Advancement of Science and the Royal Society and I find that efforts that fall under science *for* diplomacy and diplomacy *for* science show some positive outcomes while science *in* diplomacy seems to carry the denial narrative with it, producing poor results.

Chapter 1. The Narrative of Climate Change Denial in the US

1.1 Origins

The advent of public awareness of environmental issues in the 1960's and ensuing pressure on congressional representatives resulted in achievements like the Clean Air Act (1963), National Environmental Policy Act (1970), Clean Water Act (1972), Endangered Species Act (1973), and creation of the Environmental Protection Agency (EPA, 1970). Perhaps inevitably the momentum of the environmental movement sparked a backlash and when President Reagan was elected in 1980 his winning platform had included promises to combat the 'overregulation' that was stifling private enterprise, a classic theme in conservative politics. Climate change is due to human burning of fossil fuels

[1] The next IPCC assessment report, AR6, is due out in 2022.

which release the greenhouse gases that get trapped in the atmosphere and cause global warming, however the usage of these fuels has been the driver behind the explosion of production and development over the last two centuries. This progress and future growth trajectory is not readily given up, least of all by the champions of business, the Republican party. The contention that free market capitalism in its current incarnation fails to take the externalities of fossil fuel usage into account calls for a reckoning and remediation, which would be disruptive to the existing industrial capitalism regime. In 1997 the Republican-controlled Senate felt this was threatened by the Kyoto Protocol, which called for "common but differentiated responsibilities," including requiring Annex I countries (the US) to reduce their emissions by 5-8% less than 1990 levels by 2012 while exempting Non Annex I or developing countries from the same. In order to stave off this assault to the profitable status quo those well-served by it mounted a countermovement.

1.2 The Narrative and Strategy

Climate change denial encompasses several related narratives: trend, attribution, impact, and consensus denial. Trend denial rejects the existence of global warming at all, attribution that humans are the cause, impact the degree of severity of the situation, and consensus the degree of agreement among experts. Rejection of climate change argues using various tactics that evidence does not show warming: for example, that temperature or greenhouse gas concentration readings aren't correct or don't agree between sources. The denial of the anthropogenic origins of climate change recognizes the warming but declines to attribute it to human activities, instead commonly pointing to historic warming and cooling cycles or to variations in solar activity to explain the observation. The manifestation of climate change denial that refuses to recognize potential impacts of global warming and their magnitude focuses attention on scientists and climate models that predict minimal or even positive effects of climate change, while criticizing the methods, underlying assumptions, or even qualifications of other scientists' and their work. Consensus denial argues that a significant lack of agreement exists among experts with regards to many of the aspects of the phenomenon of climate change. As will

be discussed further in section 1.3.2, this tends to utilize scientists speaking outside of their field of expertise and implies scientific truth should be connected to majority opinions (Begley 2007), a flagrant perversion of scientific principles. These narratives emerged somewhat sequentially, beginning with trend denial in the 1990's and evolving to attribution and then impact as developments and data reached critical mass that made former points of argument too difficult to contest. Consensus denial has been (and remains) evergreen and among the others there is plenty of overlap and subscribers frequently hold more than one at a time.

Since by the 1980's the environment had become an "enduring concern of the American public" (Dunlap, Polls, Pollution, and Politics Revisited: Public Opinion on the Environment in the Reagan Era 1987), a strategy had to be chosen carefully to push back on the emerging global warming story. The tension between a deregulation agenda and the broad support enjoyed by environmental causes at the time highlighted that it would be more difficult and likely less effective to fight the popular goal of environmental protection than it would be to undermine the evidence being used to support the claims for needing environmental regulations (Dunlap and McCright, Organized Climate Change Denial 2011). A strategy of highlighting uncertainty and fomenting doubt that would allow the proclaimed phenomenon to be denied on the basis of being unsound was not novel and came with a recently proven track record of success. It had been used to great effect in the 1950's by the tobacco industry to prolong their profiting despite mounting evidence of the health consequences of smoking (Oreskes and Conway 2010). This could be accomplished through the creation and maintenance of a public spectacle of dissection of details of uncertainties, preoccupation with perfect agreement, and bringing forward contrary views. Indeed, a strategy document titled Global Climate Science Communications Action Plan stated that "Victory will be achieved when average citizens 'understand' (recognise) uncertainties in climate science; recognition of uncertainties becomes part of the 'conventional wisdom'" (American Petroleum Institute 1998).

Doubt would be compounded and amplified through tactics including producing literature supportive to their cause, promoting contrarian scientists' alternative data, models, and theories, demanding equal consideration of these views in the name of fairness, attacking science mainstays like peer-review, and questioning scientific institution, government grant, and scientist integrity. Economic concerns that the costs of proposed measures like fossil fuel regulations would or could exceed the theoretical benefits also played well with the agenda; despite not being a denial, they still supported and legitimated inaction. The same American Petroleum Institute strategy outlined that success for one of the denial-aligned goals would be that "those promoting the Kyoto treaty on the basis of extant science appear to be out of touch with reality," what amounted to gaslighting.

1.3 Actors

The success of climate change denial has much to do with the robust, interwoven web of actors playing various roles in the narratives. Industries with vested interest against regulations on greenhouse gasses spearheaded the effort, quickly followed by institutions and politicians subscribing to anthropocentric, Judeo-Christian, capitalist, and or neoliberal beliefs. Front and Astroturf groups were added to the infrastructure for reinforcements and scientists sympathetic to the cause generated contrarian and ostensibly authoritative proof. Finally, conservative media spread and reinforced the message and politicians ran with it, the Republican party gradually integrating climate change skepticism into their platform. From decision-influencing to decision-making, the countermovement had its bases covered. For a visualization of the interactions of the major players, see Figure 1, "Key Components of the Climate Change Denial Machine."

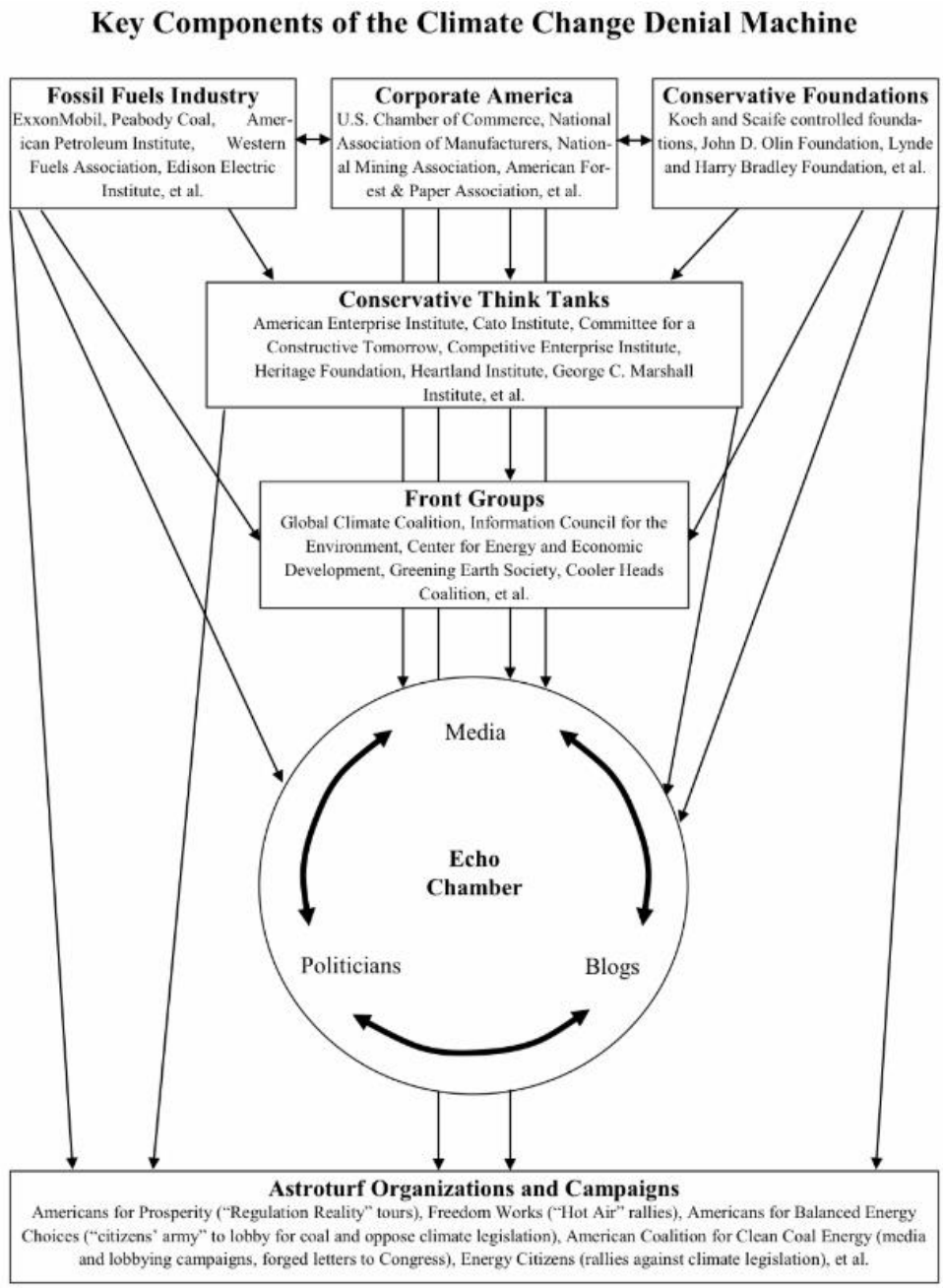

Figure 1: Key Components of the Climate Change Denial Machine

From Riley E. Dunlap and Aaron M. McCright, "Organized Climate Change Denial," in J. S. Dryzek, R. B. Norgaard, and D. Schlosberg, eds., Oxford Handbook of Climate Change and Society. New York: Oxford University Press, 2011, p. 147.

1.3.1 Industry

Perhaps the most obvious actors in the climate change denial narrative are industries with vested interests including heavy industry, automobile, manufacturing, chemical, mining, forestry, energy, and especially fossil fuel companies. These companies, their business associations and coalitions saw the potential for huge repercussions if the story emerging about greenhouse gasses turned out to be true so they placed great importance on getting in front of it and having a loud voice in the discussion. They were the first to mobilize and became the major drivers and architects of the denial machine that would eventually emerge. To this day, many continue to see viable success only through continued opposition to environmental protection and regulation and keep armies of lobbyists on hand and funds flowing to the actors to be outlined in the following sections. ExxonMobil, the oil and gas giant, illustrates an interesting evolution from initial contribution to climate science to insistence of uncertainty and continued present-day resistance to regulation.

ExxonMobil (at the time Exxon) was one of the most active corporations with respect to climate change science from the late 1970's to mid 1980's, conducting its own cutting-edge research and developing a reputation for expertise on carbon dioxide. In 1979 in fact, the US Energy Department's Carbon Dioxide and Climate Research program head David Slade commended them, writing "This represents very responsible action, which we hope will serve as a model for research contributions from the corporate sector" (Hasemyer and Cushman Jr. 2015). At the time Exxon's research and development was well-funded and conversations were open between company scientists and management at the highest levels about developments and strategy (Banerjee, Song and Hasemyer 2015). One of their scientists, Henry Shaw advocated in a memo the same year that "It behooves us to start a very aggressive defensive program in the indicated areas of atmospheric science and climate because there is a good probability that legislation affecting our business will be passed." This was not intentionally deceptive at the time, though, as he went on to say "Clearly, it is in our interest for such legislation to be based

on hard scientific data. The data obtained from research on the global damage from pollution, e.g., from coal combustion, will give us the needed focus for further research to avoid or control such polutants. [sic] We should be prepared for, and ahead of the government in making the public aware of pollution problems" (Shaw 1979).

At the managerial level, however, a reversal was underway. In 1982 a memo summarizing the results of in-house research was shared internally, expressing agreement with the scientific consensus on what they referred to as the "CO_2 greenhouse effect." Although the correspondence endorsed the linkage between burning fossil fuels and rising atmospheric carbon dioxide levels and explicitly mentioned that the greenhouse effect "would warm the earth's surface, causing changes in climate affecting atmospheric and ocean temperatures, rainfall patterns, soil moisture, and . . . potentially melting the polar ice caps," (Cohen 1982) Exxon chose to sit on these conclusions, cut their budget for climate research by 86% and began dedicating themselves to ignoring, hiding, and questioning their own scientists' determinations (Greenpeace n.d.). The rationale given for halting further planned research was twofold: that current studies met Exxon's needs and that government funding may not be available (Barnum 1981) but the timing, with Ronald Reagan having just been elected on anti-regulation campaign promises (see section 1.5) was convenient as well. Exxon and its fellows instead directed their efforts towards securing their business prospects by opening the funding pipeline to amass supportive voices and literature as I will discuss in the following sections.

1.3.2 Contrarian Scientists

Scientists play a crucial role in the denial of climate change by offering their judgements as a counter on the same level at which the science originates. These scientists are frequently referred to in the literature as 'contrarian scientists' (see for example Bjornberg, et al. 2017, Lahsen 2008, Dunlap and McCright 2015) and although they are credentialed scientists, very often they are operating outside of their field of expertise when they express opinions on climate science (Dunlap and McCright, Organized

Climate Change Denial 2011). Additionally, this mechanism of rebuttal doesn't rely on peer-reviewed publications to express dissent; it is sufficient for the scientists to express their disagreement via white papers, critiques of others' work, as guests on media channels, or as invitees testifying before Congress. None of these missing qualifications matter much however, because "to most civilians, a scientist is a scientist" (Begley 2007).

Leveraging opposing scientists was a tactic borrowed from the tobacco industry's playbook and some of the names were even the same (Oreskes and Conway 2010). Two repeat offenders, so to speak, were Fred Singer, an atmospheric physicist and Fred Seitz, a solid state physicist. Singer and Seitz had both lent their credentials (notably not medical credentials) to the tobacco industry and publicly questioned the connection of various health problems to smoking. They illustrate an interesting correlation: more than half of the skeptical scientists employed by climate denying organizations were physicists (remove?). Beyond the financial gains they receive when stumping for the denial outlets, these contrarian scientists are motivated by a broadly shared ideology of free market capitalism and anti-government regulation, both of which global warming threatens as an issue that requires governmental involvement and market adjustments (Oreskes and Conway 2010).

Contrarian scientists' individual voices were frequently used to argue against the science but sometimes the tactic was to attack consensus by showing strength in numbers. Ahead of the Kyoto Protocol Fred Singer compiled the Leipzig Declaration on Global Climate Change, in which just over 100 scientists and scientist-adjacent types like meteorologists signed on to the statement that they could not "subscribe to the politically inspired world view that envisages climate catastrophes" (Leipzig Declaration on Global Climate Change 1995). In 2008 Republican Senator James Inhofe from Oklahoma commissioned a report for the Senate Environment & Public Works Committee that listed 650 international scientists who held a variety of skeptical or dissenting opinions on climate change (U.S. Senate Environment and Public Works Committee Minority Staff

Report (Inhofe) 2008). Upon review however, it was found that 80.2% of those cited had no peer-reviewed publications related to climate science (only about 15% did) and that only 34.93% worked in a climate science-related field (Jordan and O'Brien 2009). These efforts were more media stunts than anything because consensus should be determined by comparing the alignment of results of scientifically-reviewed and accepted publications rather than the collection of signatures from or names of those sharing convictions, even those strongly held.

Conservative-aligned think tanks (CTTs, discussed in the following section) are a well-trodden path for contrarian scientists. Working in this capacity for such organizations is an opportunity to support the countermovement without being directly connected to fossil fuel companies, thereby avoiding potential reputational damage and questions of intellectual independence. It also has the added benefit of amplification of one's message via the respected and influential stage offered by the CTT. The most important function scientists perform is publishing denial literature but scientists frequently also fill advisory committees and expert panels, act as expert speakers, liaise with the media, and support congressional briefings and hearings (Dunlap and McCright, Challenging Climate Change: The Denial Countermovement 2015). The visibility the scientists receive this way can overcome a lack of standing within their own scientific community and establishing a linkage with a CTT can thus be an attractive career option (Monbiot 2007).

1.3.3 Conservative Thinktanks, Front Groups, and Astroturf Groups

CTTs, originating from the foundations of wealthy conservative families were established to push back on the progressive accomplishments of the 1960's (Lapham 2004). They share foundational values of limited government, free markets, and unrestricted economic growth and some seem very much less interested in arguing the science behind climate change for its own sake than they do in contesting climate change based on ideology (McCright and Dunlap, Anti-reflexivity: The American Conservative movement's success in undermining climate science and policy 2010). Some of the best-

known and most influential are the Heritage Foundation, Cato Institute, Heartland Institute, Competitive Enterprise Institute (CEI), George Marshall Institute, Americans for Prosperity (AFP, formerly Citizens for a Sound Economy), and Committee for Constructive Tomorrow (CFACT), which function as 'social movement organizations' furthering conservative ideals like those on which they are founded (Jacques, Dunlap and Freeman 2008). Despite these biases they are perceived as credible sources of scholarly material and supply a steady stream of anti-climate change content to media outlets, syndicated columnists, bloggers and radio hosts as well as sometimes ready-made policy proposals to Congress (Oreskes and Conway 2010). In a symbiotic relationship, their standings are enhanced by hosting contrarian scientists and being connected to their scientific credentials, with the scientists benefitting from their media connections, reputation, and of course funding (McCright and Dunlap, Defeating Kyoto: The conservative movement's impact on U.S. climate change policy 2003).

Because of their good reputation, CTT's are an excellent channel for corporations and rich philanthropists like David and Charles Koch, oil fortune heirs, to clandestinely fund efforts to discredit climate change or promote the various skeptic narratives. Front groups offer another avenue for corporations who wish to promote their interests but with a degree of separation from their public doings, especially when they may not play well in the press as in the case of anti-environmental efforts. Three groups are noteworthy for their effective subversion of climate change efforts: the Global Climate Coalition (GCC), Information Council on the Environment (ICE), and Cooler Heads Coalition (CHC). The GCC, founded in 1989 in reaction to the birth of the IPCC and with the Kyoto Protocol in its crosshairs counted among its members Chevron, Exxon, the American Petroleum Institute, General Motors, the National Association of Manufacturers, and the United States Chamber of Commerce. The mission statement asserted that "Existing scientific evidence does not support actions aimed solely at reducing or stabilizing greenhouse gas emissions" (Desmogblog n.d.) and after the Kyoto Protocol was successfully defeated and since the George W. Bush administration posed no threat, the GCC dissolved in 2002. In 1991 the

ICE was established by energy companies including the National Coal Association, Western Fuels Association, and Edison Electric Institute with the goal to "reposition global warming as a theory (not fact)," however this agenda leaked (Pooley 2010) and operations had to continue under a new front. The disingenuously named Greening Earth Society reincarnation took a new approach, positioning carbon dioxide as good for the environment. This framed global warming as a positive and communicating via the World Climate Review quarterly which became the World Climate Report, both edited by a contrarian scientist (ibid). Finally, in 1997 the CHC was created from its parent, the also deceitfully named National Consumer Coalition, which opposes consumer protection regulations, to disseminate global warming denial literature. The CHC is supported mostly by CTT's rather than business, among them the Marshall Institute, Heartland Institute, CEI, and CFACT, and is known for targeting climate scientists who support climate change science while promoting their own payroll contrarian scientists (Dunlap and McCright, Challenging Climate Change: The Denial Countermovement 2015).

While true grassroots movements indicate popular support for something, Astroturfing aims to produce this impression while in fact originating from an existing interest group like an industry or front group. Astroturf campaigns try to obscure their sources of funding and commonly use public relations firms to further distance their backers from their efforts. The conservative Koch brothers and Richard Mellon Scaife have notably poured millions of dollars into groups like AFP, Freedom Works, and CFACT, which have covertly organized initiatives like the 2008 "Hot Air Tours" (rallying cry: "Global Warming Alarmism: Lost Jobs, Higher Taxes, Less Freedom"), and "Energy Citizens" rallies in 2009 (in cooperation with the API) to promote climate legislation opposition (Greenpeace 2010). A leaked memo sent by the API requested its 400 members to encourage their employees to attend the rallies and treat the communication as "sensitive information" because "we don't want critics to know our game plan," while the website boasted that Energy Citizens was "a movement made of up tens of thousands of Americans" (Goodell 2010).

1.3.4 Conservative Media and the Echo Chamber

Conservative media outlets across various channels play a role in perpetuating and even exacerbating climate denial narratives. The literature around climate change media coverage is vast, but I will focus on the correlation between conservative media and greater emphasis on climate change denial coverage and the "echo chamber" that can be observed within conservative media that serves to amplify climate change denial narratives.

As previously discussed in section 1.1 on the origins of climate change denial, American conservatives felt that climate change threatened many of their core values by laying bare the failures of free market economics, exposing a need for government regulation, and advocating a certain amount of subordination of man to nature. The coverage of developments in climate change science and of domestic and international climate policy proposals by conservative media was therefore both by organizations hostile to the topic and for an audience predisposed against it. As seen in the previous sections, contrarian scientists and CTT's were on standby with plenty of opinions and publications and, mainly thanks to the CTT's, the relationships with media were well-established. A 2008 study comparing climate change coverage from 1998 to 2004 between liberal-leaning cable news channel CNN and conservative Fox News showed that the former was observably more likely to present global warming as real and the latter more likely to raise concerns of scientific uncertainty (Hart 2008). Fox News was also found to have used a more dismissive tone when dealing with climate change coverage than did its non-conservative major cable network peers CNN and MSNBC and hosted a higher ratio of climate change skeptics to climate change believers (Feldman, et al. 2011).

Conservative media beyond cable news also demonstrate bias in climate change reporting. Media under the News Corporation umbrella (owned by conservative media mogul Rupert Murdoch), including the Wall Street Journal, had largely denied the science of climate change up to 2007 when they announced plans to become carbon neutral. This

was observed across editorial coverage, commentary, and op-eds published, with the prevailing attitude towards climate change one of political correctness rather than science (McKnight 2010). Conservative talk radio host Rush Limbaugh commonly uses the disparaging term 'environmental wackos,' syndicated personality Glenn Beck peddles denial narratives, and the world of online blogs that sprung up in the early 2000's saw several dedicated to poking holes in climate science gain huge popularity, for example wattsupwiththat.com, run by a meteorologist (Dunlap and McCright, Organized Climate Change Denial 2011).

This robust ecosystem of contrarian scientists, CTT's, conservative media outlets, and aligned politicians (see next section) results in a self-reinforcing "echo chamber" (see Figure 1). A good example of its efficacy is that of a manufactured scandal known as Climategate that occurred in 2009. After a selection of hacked emails from the Climatic Research Unit of the University of East Anglia in the UK were released out of their context, many media outlets sympathetic to anti-climate change rhetoric reported them in a sensational manner, creating the appearance that climate change was a conspiracy being perpetrated by unethical climate scientists (Greenpeace 2010). The subsequent investigations by both UK and US committees, the US Department of Commerce, EPA and Penn State University found no truth to these claims of data manipulation, however the media circus caused lasting damage by measurably damaging public belief in the veracity of climate change (Leiserowitz, et al. 2010).

1.3.5 Conservative Politicians and Political parties

Conservative politicians and their Republican party, as subscribers to an ideology based on the supremacy of the free market and limited government regulation, tend to find climate change a tough pill to swallow because of the implications its existence would have when it comes to addressing the issue. Accepting the causal link to human activity can also chafe against Christian beliefs that the earth and therefore its climate are created

as intended by God[2]. Republican Senator James Inhofe of Oklahoma epitomizes both the trend and attribution denials, famously declaring global warming "the greatest hoax ever perpetrated on the American people," (Congressional Record 2003) (indeed publishing a book titled The Greatest Hoax: How the Global Warming Conspiracy Threatens Your Future), and expressing that he considers it arrogant to think that humans could change God's climate.

Congressional Republicans have participated in the "echo chamber" by effectively putting climate scientists on trial in hearings on global warming (McCright and Dunlap, Defeating Kyoto: The conservative movement's impact on U.S. climate change policy 2003), inviting contrarian scientists to testify in Congress (Koebler 2014), and signing a "No Climate Tax" pledge pushed by the AFP (Mayer 2013) to name a few. At the state level, Republicans have made good use of draft legislation from the conservative, industry-funded American Legislative Exchange Council (ALEC), which highlights climate change uncertainties and writes anti-regulation legislation and has seen the departure of major corporations including ExxonMobil, Royal Dutch Shell, Google, and Microsoft in recent years due to its continued advocacy against climate change policy (Cama 2018).

In the three decades since the emergence of climate change denial the Republican Party has not come any closer to acceptance. The party's official 2020 platform[3] declares that "coal is an abundant, clean, affordable, reliable domestic resource," states "We oppose any carbon tax," and "We will likewise forbid the EPA to regulate carbon dioxide, something never envisioned when Congress passed the Clean Air Act." Further rhetoric includes reference to "Democratic Party environmental extremists, who must reach farther and demand more to sustain the illusion of an environmental crisis," declares "The United Nations' Intergovernmental Panel on Climate Change is a political mechanism, not an unbiased scientific institution," rejects both the Kyoto Protocol and the Paris

[2] As of a 2014 study, 82% of Republicans identify as Christian (Pew Research Center 2015).
[3] The 2020 platform is the 2016 platform re-approved due to logistical issues of convening the Republican National Committee's 5000 members for a vote during the COVID-19 pandemic (Teirstein 2020).

Agreement and demands “an immediate halt to U.S. funding for the U.N.’s Framework Convention on Climate Change” (Armstrong and Sprouse 2016).

1.3.6 Federal Government

Last of the actors but certainly not least, the federal government has at times been a major actor in the climate change denial narrative, setting norms in roughly four year increments as power changes hands and balances are struck within the legislative and between the executive and legislative branches. Since the emergence of the trend denial narrative in the 1990’s there have been five presidential administrations and a wide variety of attitudes towards climate change, ranging from institutionalization of climate change denial in the George W. Bush years to championing the cause in the Obama years. To avoid getting bogged down in all of the details that would be needed illustrate the usually hybrid situation of climate change acceptance or denial that exists (between the dominant party in each of the two houses of Congress, the net result of that, the chief executive and whether climate actions are in the form of legislation, executive action, or other forms of influence), I will focus on the two administrations that displayed climate change denial most prominently: those of George W. Bush and Donald Trump. In this section I will address domestic climate change attitudes and responses while international ones will be handled in Chapter 2.

George Bush senior said of himself “I am an environmentalist,” signed the Global Change Research Act requiring federal research on global warming, signed the Clean Air Act of 1990 that listened to scientists and took action on acid rain and the deteriorating ozone layer, and attended (if reticently) the 1992 Earth Summit in Rio de Janeiro. His son George W. Bush would be a very different Republican president when it came to the environment and the first to let conservative ideology and industry influence trample science broadly but especially climate science. In office for two terms, between 2001 and 2009, Bush took over from Democrat Bill Clinton and largely abdicated environmental matters to his vice president Dick Cheney, who had a clear goal in mind: halting

environmental regulatory and policy progress thereby keeping industry happy. The main strategy used by the Bush administration to accomplish that goal was consensus denial, claiming the need for more research and advocating “let’s wait and see” in the meantime, while suppressing and censoring their own scientists and science. Cheney voiced the attribution dimension of the climate change denial narrative when asked about global warming in 2007, admitting he saw an “emerging consensus that we do have global warming” but saying that where that agreement “begins to break down, is the extent to which that's part of a normal cycle versus the extent to which it's caused by man, greenhouse gases, et cetera,” concluding that “it's not enough just to sort of run out and try to slap together some policy that's going to "solve" the problem” (Cheney 2007). That policy of delay was never reversed as the research piled up, though: the conclusions of a report commissioned from the US’ National Academy of Sciences which agreed with the IPCC’s assessment that human activities are the cause of global warming was ignored, as were many others. The White House Council on Environmental Quality (CEQ), one of the executive branch’s policy institutions, stepped on the independence of the EPA from the start when President Bush “clarified” his climate policy. When laid out, the new policy reversed his campaign assertion that he would work to cap carbon pollution and went a step farther, stating that carbon dioxide is not a pollutant under the Clean Air Act. Massachusetts eventually sued the Bush EPA for failing to enforce the law and in 2007 the Supreme Court ruled against the administration.

ExxonMobil, at the time the most valuable American company, and having redirected their research budget towards lobbying advocating all of the facets of the denial narrative, had fingerprints all over the Bush administration’s decisions, indicative of how deep in the pocket of industry the administration was. A lobbyist for Exxon requested that scientists involved in both the IPCC and the National Assessment report that had agreed with the IPCC’s conclusions be let go: they all were (Dickinson 2007). The 21st Century Climate Action Agenda developed by the GCC, of which Exxon was a member, became almost verbatim the official White House climate policy. Instead of any

mandatory emissions reductions, voluntary actions were requested. Finally, the Energy Policy Act that was passed in 2005 included provisions for the construction of highly polluting coal power plants and $15 billion in subsidies for oil, gas, and coal producers. Cheney chose a former industry lobbyist to head the CEQ, who then installed Phillip Cooney, formerly of the API, as his right hand in charge of managing the White House's image on climate change. Cooney edited the Bush administration's Climate Action Report for the UN, inserting emphasis on scientific weakness and uncertainty, demanded the removal of reference to the National Assessment in an EPA report called Our Changing Planet, and attempted such significant rewrites of a section on climate change in another, the EPA Draft Report on the Environment, that the then-head of the EPA resigned. He was also responsible for passing along a junk science paper with funding from the API and written by two astrophysicists from the George C. Marshall Institute that would eventually reach President Bush's desk and be widely touted by the administration in the press. The study, which concluded that there was no evidence of global warming in the 20th century, was so faulty in fact that the editor in chief of the minor German journal it had been published in resigned. Another congressional testimony of the same James Hansen summarized the extent of censorship and suppression of science during the Bush years: he described the NASA press office as "an office of propaganda" and said that "Interference with communication of science to the public has been greater during the current administration than at any time in my career" (Hansen 2007).

When Donald Trump was elected in 2016 there was reasonable uncertainty around what his climate policy would look like. A businessman before committed political affiliations, Trump had switched between the Democratic and Republican parties several times over the years and had signed on to an open letter in a full-page advertisement in the New York Times in November 2009 calling on then-president Obama and Congress to pass measures to control climate change, which the ad referred to as "scientifically irrefutable" (Meyer 2016). Three years later he famously tweeted "The concept of global warming was created by and for the Chinese in order to make U.S. manufacturing non-

competitive" (Trump 2012). Just as President Bush did, Trump has made his administration as friendly to business as possible. He had campaigned on the popular Republican promises to deregulate industry, thereby freeing the economy of crippling regulations and addressing federal government "overreach" and has made good on these promises. In his time in office 67 environmental rules and regulations have been revoked and 30 more are in progress, the most-impacted category being air pollution and emissions (Popovich, Albeck-Ripka and Pierre-Louis 2020). Trump has also pushed for more energy generation from "clean coal," advocated opening protected lands to drilling, and touted natural gas harvested from fracking as "Freedom Gas."

He appointed Scott Pruitt to run the EPA, a former attorney general of Oklahoma who had previously brought lawsuits against the agency 14 times. While heading the EPA, Pruitt's objective was to bring it back in line with its mission, as he, like many conservatives, felt that it had become an overreaching "activist agency." This has involved massive alteration of the EPA website's content, namely drastically de-promoting and winnowing down content on climate change: a search on this term previously returned over 12,000 results and now returns less than half of that (Barron 2018). Pruitt resigned in July 2018 following intensifying pressure over various allegations of abuse of office but was succeeded by former coal lobbyist Andrew Wheeler who has taken up the dismantling mantle. Another cabinet appointment also reflects coziness with industry, the appointment of Rex Tillerson, former CEO and chairman of ExxonMobil, as Secretary of State in February 2017.

In the face of the congressionally-mandated National Climate Assessment released in November 2018 that flagged a temperature rise of 2.3 degrees Fahrenheit in the next thirty years and deep economic impacts Trump again responded with denial, saying that he and his administrators are "not necessarily such believers" (Mooney and Dennis, Major Trump administration climate report says damages are 'intensifying across the country' 2018). This shows a continuation of the Bush trend of ignoring his government's own

scientific conclusions. To make this easier Trump initiated a sweeping overhaul of federal advisory committees, reducing the number from approximately 1000 to 350. The structure and composition of committees was also changed, replacing independent scientists with industry appointees lacking scientific qualifications (Reed, et al. 2018). On the EPA's Clean Air Science Advisory Committee there is now a lone scientist out of seven seats (Shogren and Aminy 2019). Where scientists are left in place there have been heavy restrictions on their communications with journalists, sharing of data, and infringements on participation in scientific conferences where research would be presented (Union of Concerned Scientists 2019).

The climate change denial has at times been accompanied by what look like purely ideologically-motivated decisions. In a logic-defying maneuver the Trump administration revised the Corporate Average Fuel Economy fuel efficiency standards, referred to as CAFE, down to 37 miles per gallon from the 54.5 miles per gallon that were set to be required based on Obama-era CAFE rules. This reversal flies in the face of the origins of the CAFE standards in the first place: they were born in the 1970's of the energy crisis when Congress sought to make American car manufacturers produce more fuel efficient vehicles to help ease the pain the American drivers were feeling at the pump and in the long lines waiting to get to it. With the reduction, the National Highway Traffic Safety Administration has calculated savings of up to $563 billion and roughly 12,700 lives, but these estimates are based on the assumption that if cars are less efficient, Americans will feel more pain at the pump and therefore drive less. Therefore, according to the Department of Transportation, fewer people will die in car accidents. Not content to leave it there the National Highway Traffic Safety Administration revoked California's waiver to set its own more stringent air pollution standards: California's attorney general and 23 other states are suing the agency (Green and Bowden 2019).

1.4 Messaging and Transmission

The climate change denial narratives emanating from the aforementioned actors have been largely aimed at two decision-making parties, the American public and their elected representatives. The latter are primarily influenced through their electorate or via lobbying from industry or other interest groups. As I have already described the clout of industry (see section 1.3.1) and outlined the interest groups (CTT's, front groups, Astroturf groups, and their funders) from which lobbying would also emanate (see section 1.3.3), here I will focus on the messaging and transmission to the American public. It follows that the interested American public, as the electorate, would then influence their representatives votes on legislation or elect new representatives aligned with their views, ultimately producing the desired action (or inaction) on climate change.

The transmission model in this case is between the sources of climate change information, the media, the electorate, and their elected representatives. Since the American public isn't a regular consumer of academic journals or IPCC reports and especially before technology offered more accessible direct connections between information sources and consumers, the media has been responsible for the majority of the information Americans have received about global warming. Journalistic outlets have reported on climate change since it rose to prominence in the 1980's, building on existing interest and concern about the environmental issues that emerged in the 1950's and 1960's. Initially, well-intentioned journalistic norms unwittingly aided the denial machine in disseminating their messages by seeking to report "both sides of the story." This meant that a story on a development in climate science would be reported alongside a matching dissenting scientist, climate model, dataset, or other objection. This gave climate change deniers the opportunity to spread their messages with an equally loud voice, producing for the reader or listener a skewed picture of the degree of alignment within the scientific community, making it seem like a roughly equal debate. This contributed to a deep divide in the American public's acceptance or rejection of climate change, largely along party lines (Boykoff and Boykoff 2004). Due to constraints on journalists' scientific competence,

time, or resources, balanced reporting can act as “a surrogate for validity checks” (Dunwoody and Hans 1992). While a good policy for the social or political realm, it is entirely inappropriate for science except if the different sides of the issue are weighted appropriately and explicitly.

1.5 Reception

The popularity of the environmental movement like most movements has ebbed and flowed over time. Weather events, economic conditions, changing federal administrations, party affiliation, scandals, scientific findings, and other factors and events competing for attention have all influenced Americans’ reception of the veracity of climate change versus its denial. In this section I will discuss the popularity and relevance of environmental issues to American voters, as it is this connection to elections that would translate values into actions, as well as the current degree of adoption of the narrative by the American public.

The Reagan administration, during which news of climate change first received broad attention, was aggressively pro-development and pro-business, referencing Reagan’s substantial victory as an electoral mandate to deregulate in order to stimulate the economy. An assessment of numerous longitudinal opinion polls found that during the 1980’s public opinion considered environmental concerns serious and compelling and suggest that this was correlated with a few factors (Dunlap, Polls, Pollution, and Politics Revisited: Public Opinion on the Environment in the Reagan Era 1987). A growing public awareness of environmental problems and a prevailing view that the government should be responsible for better protection of the environment explain these sentiments better than simply the rejection of Reagan’s deregulatory environmental agenda. This led to a situation of “permissive consensus” in which elected officials are mostly free to address a topic, in this case the environment, however they choose without incurring significant electoral recourse because the public’s support is widely-held but not very intense. Many “tradeoff” polls from the time illustrate the opposite, for example in 1986 66% of those

surveyed responded that they agreed with the statement that they support environmental protection regardless of cost versus only 27% disagreeing, and 58% would choose to sacrifice economic growth versus 19% choosing to sacrifice environmental quality (ibid). Despite these expressed preferences, studies have shown that it is a better predictor to instead survey voters about which issues would impact their voting, and in this case despite the popularity of environmental issues, you do not find significant numbers of voters naming the environment as their determinant issue.

This picture of the environment enjoying broad popularity but not commanding "key voting issue" status remains indicative of contemporary American preferences. A December 2020 poll[4] by Gallup of issues that would be "extremely important" to voters determining which candidate they would vote for in the 2020 election registered climate change at 26%, 55% if combined with those who said it would be a "very important" issue for them. Unsurprisingly the poll found large partisan differences, with a 36 point gap, the largest of any issue polled, separating Democrats (44% of which ranked climate change "extremely important") and Republicans (8%) (Hrynowski 2020). As recently as 2014, 20% of Americans had responded in a survey that climate change is not happening, of which 29% said that it is not caused by human activity (The Associated Press-NORC Center for Public Affairs Research 2014). By August 2019 the number of deniers had decreased to 9% but within that population 34% deny that human activity has caused the problem (Associated Press and National Opinion Research Center 2019). These divides between public opinion and the extant body of scientific knowledge is excellent evidence of the efficacy of the doubt-spreading strategy. The undermining of trust in scientists shows, with 55% of the deniers citing distrust of the scientific evidence as a reason. In line with what could be expected based on the alignment of the Republican party with the denial narrative, the acceptance or rejection of climate change falls largely along party lines, with

[4] Since this polling Americans have experienced the COVID-19 pandemic as well as a significant flare up of racial tensions, both of which have consumed much attention and will likely garner more focus in the 2020 election, likely diminishing that on other issues.

Republicans 20 times more likely to believe climate change is not happening and nearly four times less likely to attribute its source to man's activities.

Chapter 2. Impact of Climate Change Denial on US Science Diplomacy

2.1 Definitions

Diplomacy is an indispensable tool of statecraft for advancing goals and interests and can take many forms. Science diplomacy, in practice since human antiquity (Turekian 2018) but increasingly recognized as a lever as scientific advances have accelerated in recent decades, can be described as the nexus of diplomacy and science, scientists, and or scientific institutions. The American Association for the Advancement of Science (AAAS) and British Royal Society jointly developed and published a three-dimensional conceptualization of science diplomacy in 2010 comprising diplomacy *for* science, science *for* diplomacy, and science *in* diplomacy (The Royal Society and The American Association for the Advancement of Science 2010). It is possible to find each of these diplomatic facets in the realm of environmental protection and sustainability. An example of diplomacy for science, in which traditional diplomacy promotes and furthers scientific agendas, is the Antarctic Treaty. Signed by fourteen states in 1959, it designated Antarctica for peaceful purposes only and explicitly encouraged continued scientific investigation and cooperation on the continent. Science for diplomacy reverses the roles, with science supporting relations between states, exemplified for example by the International Thermonuclear Experimental Reactor (ITER), a collaborative nuclear fusion research project with huge potential implications for clean energy including frequently uncomfortable bedfellows, the United States, China and Russia, among others. Finally, science in diplomacy is where science informs the formulation of policies or international agreements, like in the case of the UNFCCC and Kyoto Protocol, which aim to stabilize greenhouse gas concentrations to mitigate global warming.

The "super wicked problem"[5] (Levin, et al. 2012) of climate change is inextricably tied to science, so it follows that science must be part of the solution. If, however, the validity, robustness, or influence of the science has been damaged or corrupted as it has by special interests in the case of climate change denial one might expect to see this manifest by changes in the results of science diplomacy efforts. First I will review the landscape of US participation in international climate change efforts and then I will examine evidence of the influence of climate change denial in US science diplomacy using the AAAS' and Royal Society's three-part framework as a guide. The US' Department of State (also referred to as the State Department) is tasked with foreign policy and international relations so diplomacy and therefore science diplomacy are within its remit. As discussed in section 1.3.6, the George W. Bush (2001-2009) and Donald Trump (2017-present) administrations have demonstrated the most climate change denial, so I will focus on them, with greater emphasis on the latter and referring to others when necessary for comparison.

2.2 The State of Affairs of US Foreign Relations with respect to Climate Change

The US' presence in international climate affairs is inconsistent as a result of the tug-of-of war between Democrats trying to make progress on climate change and Republican resistance. This is compounded by the fact that administrations spend much of their time in power undoing the actions of the previous occupant. The first example of this was in 1997 with the Kyoto Protocol: President Clinton signed it but it was never presented for ratification to Congress. There it would have been blocked in the Republican-controlled Senate, which had previously passed the Byrd-Hagel resolution stating that agreements that would harm the economy and that did not require emissions

[5] Levin, Cashore, Bernstein, and Auld expand Rittel and Webber's "wicked problem" concept to describe "super wicked problems" which, in addition to lacking simplistic or straightforward planning responses include the characteristics that time is running out, those who cause the problem also seek to provide a solution, the central authority needed to address them is weak or non-existent, and irrational discounting occurs that pushes responses into the future.

reductions of developing countries as well would not be supported. Finally, it was withdrawn from by President George W. Bush.

In April 2016 under President Obama the US joined the Paris Agreement, to date the multilateral climate treaty with the most potential for impact due to its binding components and almost universal participation. It was not long-lived, though, as President Trump declared in June 2017 his intent to leave it. At the same time he announced these plans Trump expressed willingness to "immediately work with Democratic leaders to either negotiate our way back into Paris, under the terms that are fair to the United States and its workers, or to negotiate a new deal that protects our country and its taxpayers," however there has been no movement towards either of these proposals. World leaders widely condemned and expressed disappointment in the planned departure, with France, Germany, and Italy issuing a joint statement saying "we firmly believe that the Paris Agreement cannot be renegotiated." Due to the provisions of Article 28 of the Agreement, the US' withdrawal cannot take place until November 2020, one month after the next US Presidential election, which offers the possibility that a change in leadership that would see a reversal of this decision upon accession to the White House in January 2021. In the meantime, given the Trump administration's commitment to "America First" nationalism, disinterest in multilateral initiatives, environmental protection in general, and policies that could be argued to have economic costs or require regulations, the possibility of the US participating in any other international climate change cooperation seems very unlikely. With this planned departure and nothing in its stead the US has effectively abdicated any global leadership in climate change efforts it had, leaving the European Union to take the helm and seek new alliances.

2.3 Science *in* Diplomacy

This facet of science diplomacy may be the most obviously relevant to climate change since it involves science informing diplomacy, in this investigation science informing international climate policymaking. With respect to climate change denial,

fortunately the concept is not common globally, with its prevalence mostly limited to the US a few other anglophone countries including the UK, Canada, and Australia (Dunlap and McCright, Challenging Climate Change: The Denial Countermovement 2015). Even in these places where it holds appeal for populations with deeply held neoliberal values and where the fossil fuel industry is influential it is not as entrenched as in the US, although in a time of science-denial and post-truth its prevalence is growing (Mooney, The Strange Relationship Between Global Warming Denial and…Speaking English 2014). It is conceivable that governments sharing climate change denial beliefs could band together to craft policies explicitly based on them, but the examples of climate science in climate diplomacy I encountered are limited to climate change denial as an obstacle in climate science-based policymaking.

Although it is impossible to know for sure how much various reasons contribute to an outcome, I will speculate. When the Kyoto Protocol, a science-informed first attempt at international cooperation on climate change entered the scene the denial machine was already up and running. If it had been given to Congress for approval it is very possible that the Republican-controlled Senate would have expressed climate change denial-motivated misgivings. When President George W. Bush addressed the topic in 2001 however, this did not come up. Rather than question whether such a commitment was necessary in light of uncertain science, a position his administration certainly expressed when it came to domestic policy, the cited reason was unequal burden among signatories. In fact, Bush said "America's unwillingness to embrace a flawed treaty should not be read by our friends and allies as any abdication of responsibility. To the contrary, my administration is committed to a leadership role on the issue of climate change" (Bush 2001). The same economic disadvantage argument was given by President Trump for withdrawing from the Paris Agreement. From this perspective it would seem to be encouraging, then, that if this economic fairness argument can be ameliorated the stumbling block for US participation in international climate treaties will be removed. There is a question however, of whether these economic arguments were put forth

because they were considered to be more acceptable by the rest of the world than reasons based on climate change denial would have been.

Another diplomatic effort informed by science and easily the most well-known example of science supporting policymaking, the IPCC provides an excellent study of the interface of science and diplomacy. The organization's mission is to "assess on a comprehensive, objective, open and transparent basis the scientific, technical and socio-economic information relevant to understanding the scientific basis of risk of human-induced climate change, its potential impacts and options for adaptation and mitigation" (Principles Governing IPCC Work, Article 2 n.d.). The IPCC's reports guide the implementation of the UNFCCC and are not products of in-house research but rather the accumulation of and commentary on existing research by thousands of climate scientists from all over the world. On the science side, the IPCC aims to express the points of agreement and dissent in the state of the art of existing research rather than determining an amenable middle ground position, thereby not compromising the integrity of the science. On the policy side however, the IPCC is structured in such a way as to ultimately produce a consensus that can be used to inform policies in the form of a Summary for Policymakers. After the best climate science has been collected and reviewed in a draft report it is provided to member governments' representatives and NGOs. They are invited to comment on it and these comments are then all included in the report.

The approval of the Summary report by member countries of the Climate Convention occurs in an IPCC plenary meeting where diplomats and the scientist authors workshop the order of and emphasis on the content without changing its substance. The hybridization that results from the collaboration between scientists and diplomats aims to support informed policymaking, however it is evident that this does not necessarily translate into action on these agreed-upon points. Although the contents of the Summary for Policymakers are agreed upon only following a line-by-line review, which "ensures that no country officially distances itself from the assessment reports and their conclusions

that collectively validated human responsibility in global warming," (Ruffini 2018) this is no guarantee that members will then take on climate actions together. Indeed, the Conferences of Parties tend to produce feeble results because states' interests supersede these collective agreements. In the Summary report science rules, with scientists having the ultimate say on the verbiage. In the COP though, diplomacy rules, and this is the part of the mechanism that produces collective action (or not). Since national interest is at the core of science diplomacy, differing national interests easily interrupt scientific consensus (Gluckman, et al. 2017). A member country's government subscribing to climate change denial among a field of climate change believers would certainly accomplish this, however even the normal competitive interests between countries are enough, and again, this presents a more socially acceptable reason and one intractable reason can be more than enough to derail negotiations.

In an overt instance of climate change denial disrupting diplomatic progress, a UN working group on science and technology was dealt a setback in 2018 over a wording impasse. Saudi Arabia, Russia, and the US banded together over semantics around the reception of a Special Report commissioned of the IPCC "on the impacts of global warming of 1.5 degrees Celsius above pre-industrial levels and related global greenhouse gas emission pathways." The US State Department explained that "The United States was willing to note the report and express appreciation to the scientists who developed it, but not to welcome it, as that would denote endorsement of the report…As we have made clear in the [Intergovernmental Panel on Climate Change] and other bodies, the United States has not endorsed the findings of the report" (Nakamura and Fears 2018). Compared to leaving the Paris Agreement this linguistic and bureaucratic detail is minor, but its effect of detracting from achieving substantive progress is not insignificant, and it is emblematic of the reticence and evasiveness that characterizes the current US administration's approach towards climate change action.

2.4 Diplomacy *for* Science

Diplomacy for science "seeks to facilitate international cooperation, whether in pursuit of top-down strategic priorities for research or bottom-up collaboration between individual scientists and researchers" (The Royal Society and The American Association for the Advancement of Science 2010). Scientists have already of their own volition sought each other out, established relationships, and collaborated on science internationally for decades if not centuries on research that has contributed to the body of knowledge about climate change. There are examples of this being organized or further facilitated at the federal level, however.

The Science Envoy program launched in 2009 puts US State Department support behind already distinguished scientists who then employ their networks in their fields to "forge connections and identify opportunities for sustained international cooperation" (U.S. Department of State n.d.). The Assistant Secretary for Oceans and International Environmental and Scientific Affairs chooses scientists which are then approved by the Secretary of State. The program is not aligned with any particular scientific field but there are two former Science Envoys, Dr. Arun Majumdar and Dr. Barbara Schaal who worked on renewable energy and the transition away from fossil fuels and biotechnology in support of agricultural challenges arising from climate change, respectively. The current crop of envoys doesn't include any climate scientists but between the current and prior cohorts a good variety of fields is represented. In the absence of any journalism reporting biased appointments there is no way to know if a climate skeptic Secretary of State like Rex Tillerson, President Trump's first appointee and former ExxonMobil CEO, has influenced the selection but there is no evidence to be found at present.

Economic diplomacy is seen to intersect with diplomacy for climate science when the funding of various international climate funds and institutions are examined. The Green Climate Fund, meant to mobilize climate finance under the UNFCCC for use supporting climate projects, programs, and policies in developing countries, has previously seen the US pledge $3 billion, of which $1 billion has been deposited (Green Climate Fund

n.d.). In the US' 2020 fiscal budget, however, Congress committed no money while 13 other countries doubled their contributions (Thwaites 2020), reflective of the desires of President Trump as well as of the Republican-held Senate. In the case of the UNFCCC and its parent the IPCC, the World Resources Institute notes that the US "had been a reliable and major contributor to these UN bodies […] providing around two-fifths of the IPCC's total budget and a fifth of the UNFCCC's," however "In the last three years Congress did not allocate funding from the International Organizations and Programs account to these entities." The 2020 budget has earmarked $6.4 million for them, considerably less than the $10 million contributed annually up to 2016, but still a step back in the direction of showing interest in and commitment to climate goals.

2.5 Science *for* Diplomacy

Where science in turn supports diplomatic goals, the prevailing attitude of the US government towards climate change can conceivably result in the establishment, improvement, or decline of diplomatic relations. The favorite example of science for diplomacy of US and Soviet astronauts shaking hands aboard the International Space Station during the Cold War doesn't yet have as famous an analogue in the case where of climate change denial or acceptance is considered as promoting diplomacy. There can be geopolitical implications for embracing the scientific consensus and showing dedication to climate goals, however. Climate change support was cited as one factor in the September 2018 decision of the nations of the Solomon Islands and Kiribati to establish diplomatic relations with China, ending the existing ones with Taiwan. These Pacific island nations are already dealing with the impacts of climate change manifested by sea level rise and Kiribati President Taneti Mamau pointed out that China has remained committed to the Paris agreement, saying "They are serious about it." Micronesian president David Panuelo describes the US as his nation's closest ally, but has expressed the wish that the US would return to the Paris Agreement (Westerman 2019). Any alliances of states with China erode the US' interests in the Indo-Pacific, where it participates in the Quadrilateral Security Dialogue with India, Japan, and Australia as a check on China's influence and activities in

the region. As states experience increased stress from and impacts of climate change, they will seek help, so commitment to climate goals is a lever of diplomacy the influence of which is likely only to grow.

A related concept is that of "science as aid," where, for example, genetically modified crops could better withstand droughts or produce more income for a country in need (Legrand and Stone 2018). Whether future administrations in the US will choose to continue denying the trend, anthropogenicity, or scientifically predicted effects of climate change, as time goes on effects like severe weather occurrences and sea level rise will impact more countries, including the US itself. There will be an opportunity to provide climate change science-informed aid, for example through USAID, the US' foreign assistance and international development agency. USAID already addresses climate change both in its operations and recognizes the connection to fossil fuel use on its website (USAID 2019). In the case of a governmental endorsement of climate change research on mitigation and adaptation would be facilitated. This better-prepared aid would then be more beneficial to those receiving it.

Despite a decrease in recent decades in the funding committed to research and development (Isaacson 2019), the US is still regarded as preeminent in the world for its science and technology. Even in the face of some of the world's most challenging visa policies, the US attracts large numbers of PhD candidates and science and technology entrepreneurs and cities like San Francisco are still hotspots of innovation. Democrat and Republican-controlled administrations alike have allowed declining investments in science and technology. Climate change denial on the other hand, a conservative phenomenon, has the potential to have a chilling effect on an entire field of study. During the Iraq war when polls showed attitudes towards the US in 33 countries declined to historic lows, with only 40% viewing America's influence as mainly positive (compared to 45% for China and 58% for Europe) (BBC World Service Poll 2004), science and technology were still held in high esteem. This was true even in the Middle East, where they ranked as the single most

respected elements of American society (Zogby International 2004). This is another reason that science remains a worthy focus and considering the rest of the world's continued interest in climate change, it would be unwise of conservative political leaders to limit the US' potential in climate change science for ideological reasons.

Conclusion

While recent polling shows a decrease down to single digits of the number of Americans that deny climate change is happening significant percentages still deny its anthropogenicity and distrust the field of climate science and its scientists. The Republican political establishment has enshrined climate change denial as a litmus test for candidates and mandatory demonstrations of commitment like the "No Climate Tax" pledge severely constrain any opportunity for compromise and cooperative policymaking with Democrats. The denial machine and its echo chamber create a self-sustaining ecosystem that there is no reason to question or leave and the gulf widens between conservative and liberal ideologies. When in control at the federal level the climate change deniers use a mandate from only half of the country to justify unilateral withdrawals from historic international climate agreements that although deeply flawed are the only hope we have for now. The outlook seems bleak indeed.

Like it has been domestically, internationally the climate change denial narrative sometimes held at the highest levels of American government has been a very effective obstacle to progress on climate change policy. The two landmark climate treaties, the Kyoto Protocol and the Paris Agreement look like they could suffer the same fate: the withdrawal of the participation of the world's second largest polluter. With no end to the climate change denial narrative in sight, it will remain a possibility that every time the regime cycles, America will flip flop on any progress that has been made. This doesn't make the US a very appealing diplomatic partner for the rest of the world that remains committed to addressing climate change, but science diplomacy does offer some interesting potential workarounds. Science *in* diplomacy seems like it may offer the

greatest risk of contamination by climate change denial, but diplomacy *for* science may offer workarounds by building upon existing diplomacy by scientists. Science *for* diplomacy, by providing strategic, efficient, and economically appealing motivations may be another viable path. One thing is certain, though: in the face of climate change we will need to use all of the tools at our disposal.

References

American Association for the Advancement of Science. n.d. *Science Diplomacy: An Introduction.* Accessed May 5, 2020. https://www.aaas.org/programs/center-science-diplomacy/introduction.

American Petroleum Institute. 1998. "Memo on Draft Communication Plan."

America's Pledge. 2020. *About America's Pledge.* Accessed May 24, 2020. https://www.americaspledgeonclimate.com/about/.

1959. "Antarctic Treaty."

Armstrong, Kelly, and Victor Sprouse. 2016. "Republican Platform 2016." Cleveland: Republican National Committee.

Arrhenius, Svante. 1908. *Worlds in the Making: The Evolution of the Universe.* New York: Harper.

Associated Press and National Opinion Research Center. 2019. *The Politics of Climate Change.* August. Accessed June 26, 2020. http://www.apnorc.org/projects/Pages/The-Politics-of-Climate-Change.aspx.

Banerjee, Neela, Lisa Song, and David Hasemyer. 2015. *Exxon: The Road Not Taken Part II: Exxon Believed Deep Dive Into Climate Research Would Protect Its Business.* September 17. Accessed May 8, 2020. https://insideclimatenews.org/news/16092015/exxon-believed-deep-dive-into-climate-research-would-protect-its-business.

Barnum, R. E. 1981. *Scoping Study on CO2.* Exxon.

Barron, Laignee. 2018. *Here's What the EPA's Website Looks Like After a Year of Climate Change Censorship.* Accessed May 24, 2020. https://time.com/5075265/epa-website-climate-change-censorship/.

BBC World Service Poll. 2004. *Views on Countries, Regions.* BBC. www.worldpublicopinion. org/pipa/articles/views_on_countriesregions_bt/168. php?nid=&id=&pnt=168.

Beck, Ulrich, Anthony Giddens, and Scott Lash. 1994. *Reflexive Modernization.* Stanford: Stanford University Press.

Begley, Sharon. 2007. "The Truth About Denial." *Newsweek*, August 13: 20-29.

Bjornberg, Karin Edvardsson , Mikael Karlsson, Michael Gilek, and Sven Ove Hansson. 2017. "Climate and environmental science denial: A review of the scientific literature published in 1990-2015." *Journal of Cleaner Production* 167: 229-241. Accessed May 12, 2020.

Boykoff, Maxwell T., and Jules M. Boykoff. 2004. "Balance as bias: global warming and the US prestige press." *Global Environmental Change* 14: 125-136.

Bush, George W. 2001. "Press release: President Bush Discusses Global Climate Change." The White House, June 11.

Cama, Timothy. 2018. *Exxon Mobil leaves conservative advocacy group ALEC.* July 12. Accessed July 5, 2020. https://thehill.com/policy/energy-environment/396700-exxon-leaves-conservative-advocacy-group-alec.

Cheney, Dick. 2007. *EXCLUSIVE: Cheney on Global Warming.* February 23. Accessed June 7, 2020. https://abcnews.go.com/Technology/story?id=2898539&page=1.

Cohen, Roger W. 1982. *Memo.* Exxon Corporation.

Congressional Record. 2003. "Congressional Record." (U.S. Government Publishing Office) 149 (113).

Cook, John, Naomi Oreskes, Peter T Doran, William R L Anderegg, Bart Verheggen, Ed W Maibach, J Stuart Carlton, et al. 2016. "Consensus on consensus: a synthesis of consensus estimates on human-caused global warming." *Environmental Research Letters* 11: 048002.

Copeland, Daryl. 2016. "Science Diplomacy." In *The SAGE Handbook of Diplomacy*, 628-640. SAGE Publications Ltd.

Desmogblog. n.d. *Global Climate Coalition (GCC).* Accessed May 23, 2020. https://www.desmogblog.com/global-climate-coalition.

Dickinson, Tim. 2007. "Six Years of Deceit." *Rolling Stone*, June 28. https://www.rollingstone.com/politics/politics-news/six-years-of-deceit-192430/.

Dunlap, Riley E. 1987. "Polls, Pollution, and Politics Revisited: Public Opinion on the Environment in the Reagan Era." *Environment* 29 (6): 6-11, 32-37.

Dunlap, Riley E., and Aaron M. McCright. 2015. "Challenging Climate Change: The Denial Countermovement." In *Climate Change and Society: Societal Perspectives*, edited by Riley E. Dunlap and Robert J. Brulle. Oxford Scholarship Online. Accessed June 5, 2020. doi:10.1093/acprof:oso/9780199356102.003.0010.

Dunlap, Riley E., and Aaron M. McCright. 2011. "Organized Climate Change Denial." Edited by John S. Dryzek, Richard B. Norgaard and David Schlosberg. *The Oxford Handbook of Climate Change and Society* 144-164.

Dunlap, Riley E., and Peter J. Jacques. 2013. "Climate Change Denial Books and Conservative Think Tanks Exploring the Connection." *American Behavioral Scientist* 57 (6): 699-731.

Dunwoody, Sharon, and Peters Peters Hans. 1992. "Mass media coverage of technological and environmental risks: A survey of research in the United States and Germany." *Public Understanding of Science* 1 (2): 199-230.

Fähnrich, Birte. 2017. "Science diplomacy: Investigating the perspective of scholars on politics–science collaboration in international affairs." *Public Understanding of Science* 26 (6): 688-703.

Feldman, Lauren, Edward W. Maibach, Connie Roser-Re, Connie Roser-Renouf, and Anthony Leiserowitz. 2011. "Climate on Cable: The Nature and Impact of Global Warming Coverage on Fox News, CNN, and MSNBC." *The International Journal of Press/Politics* 17 (1): 3-31.

Gluckman, P.D., V. Turekian, R.W. Grimes, and T. Kishi. 2017. "Science Diplomacy: A Pragmatic Perspective from the Inside." *Science & Diplomacy* 6 (4).

Goodell, Jeff. 2010. "As the World Burns." *Rolling Stone*, January 7.

Green Climate Fund. n.d. *About GCF.* Accessed July 1, 2020. https://www.greenclimate.fund/about.

Green, Miranda, and John Bowden. 2019. *California, 23 other states sue Trump over vehicle emissions rule.* Accessed May 24, 2020. https://thehill.com/policy/energy-environment/462338-california-23-other-states-sue-trump-admin-over-rules-on-state.

Greenpeace. n.d. *Exxon's Climate Denial History: A Timeline.* Accessed May 15, 2020. https://www.greenpeace.org/usa/global-warming/exxon-and-the-oil-industry-knew-about-climate-change/exxons-climate-denial-history-a-timeline/.

—. 2010. *Koch Industries: Secretly Funding the Climate Denial Machine.* March. Accessed May 23, 2020. https://www.greenpeace.org/usa/global-warming/climate-deniers/koch-industries/.

Hansen, James. 2007. "Political Interference with Government Climate Change Science." *Testimony of James E. Hansen to Committee on Oversight and Government Reform.* US House of Representatives.

Hart, P. S. 2008. "Market Influences on Climate Change Frames in CNN and Fox News Climate Change Broadcasts." Paper, Presented at the International Communication Association Annual Meeting, Montreal.

Hasemyer, David , and John H. Cushman Jr. . 2015. *Exxon: The Road Not Taken: Exxon Sowed Doubt About Climate Science for Decades by Stressing Uncertainty.* October 22. Accessed June 23, 2020. https://insideclimatenews.org/news/22102015/Exxon-Sowed-Doubt-about-Climate-Science-for-Decades-by-Stressing-Uncertainty.

Hrynowski, Zach. 2020. *Several Issues Tie as Most Important in 2020 Election.* January 13. Accessed July 8, 2020. https://news.gallup.com/poll/276932/several-issues-tie-important-2020-election.aspx.

International Climate Science Coalition. n.d. *Core Principles.* Accessed May 23, 2020. http://www.climatescienceinternational.org/index.php?option=com_content&view=article&id=121&Itemid=67.

Isaacson, Walter. 2019. *How America Risks Losing Its Innovation Edge.* January 3. Accessed May 17, 2020. https://time.com/longform/america-innovation/.

Jacques, Peter J., Riley E. Dunlap, and Mark Freeman. 2008. "The organisation of denial: Conservative think tanks and environmental skepticism." *Environmental Politics* 17 (3): 349-385.

Jordan , Dr. Stuart, and Thomas O'Brien . 2009. *The Credibility Project: An Assessment Of The "US Senate Minority Report: More than 650 International Scientists Dissent Over Man Made Global Warming Claims".* Center for Inquiry Office of Public Policy, Washington, DC: Center for Inquiry Office of Public Policy. Accessed June 18, 2020.

Kelman, Ilan. 2017. "Governmental duty of care for disaster-related science diplomacy." *Disaster Prevention and Management* 26 (4): 412-423.

Koebler, Jason. 2014. *The House Science Committee Spent Today in a Climate Change Denial Echo Chamber.* May 29. Accessed July 5, 2020. https://www.vice.com/en_us/article/9akkqv/the-house-science-committee-spent-all-day-proudly-denying-climate-change.

Krosnick, Jon A., Allyson L Holbrook, and Penny A Visser. 2000. "The impact of the fall 1997 debate about global warming on American public opinion." *Public Understanding of Science* 9 (3): 239–260.

Lahsen, Myanna. 2008. "Experiences of modernity in the greenhouse: A cultural analysis of a physicist "trio" supporting the backlash against global warming." *Global Environmental Change* 18: 204-219.

Lapham, Lewis H. 2004. "Tentacles of rage: The Republican propoganda mill, a brief history." *Harper's Magazine*, September, 309 ed.: 31-41.

Legrand, Timothy, and Diane Stone. 2018. "Science diplomacy and transnational governance impact." *Br Polit* (Macmillan Publishers Ltd., part of Springer Nature 2018) 13: 392-408.

1995. "Leipzig Declaration on Global Climate Change." 907-908.

Leiserowitz, A. A., E. W. Maibach, C. Roser-Renouf, N. Smith, and E. Dawson. 2010. "Climategate, Public Opinion, and the Loss of Trust." July 7. Accessed May 24, 2020.

https://climatecommunication.yale.edu/publications/climategate-public-opinion-and-the-loss-of-trust/.

Levin, Kelly, Benjamin Cashore, Steven Bernstein, and Graeme Auld. 2012. "Overcoming the tragedy of super wicked problems: constraining our future selves to ameliorate global climate change." *Policy Sciences* 45: 123-152. Accessed May 18, 2020.

Mayer, Jean. 2013. "Koch Pledge Tied to Congressional Climate Inaction." *The New Yorker*, June 30. Accessed July 5, 2020. https://www.newyorker.com/news/news-desk/koch-pledge-tied-to-congressional-climate-inaction.

McCright, Aaron M., and Riley E. Dunlap. 2010. "Anti-reflexivity: The American Conservative movement's success in undermining climate science and policy." *Theory, Culture, and Society* 26: 100-133.

McCright, Aaron M., and Riley E. Dunlap. 2003. "Defeating Kyoto: The conservative movement's impact on U.S. climate change policy." *Social Problems* 50 (3): 348-373.

McKnight, David. 2010. "A change in the climate? The journalism of opinion at News Corporation." *Journalism* 11: 693-706.

Meyer, Robinson. 2016. *A Yuuuuuge Climate Flip Flop.* June 10. Accessed July 5, 2020. https://www.theatlantic.com/science/archive/2016/06/trump-climate-change-new-york-times-letter-ad/486335/.

Monbiot, George. 2007. *Heat: How to Stop the Planet Burning.* Cambridge, MA: South End Press.

Mooney, Chris. 2014. *The Strange Relationship Between Global Warming Denial and…Speaking English.* July 22. Accessed July 8, 2020. https://www.motherjones.com/environment/2014/07/climate-denial-us-uk-australia-canada-english/.

Mooney, Chris, and Brady Dennis. 2018. *Major Trump administration climate report says damages are 'intensifying across the country'.* November 23. Accessed June 19, 2020. https://www.washingtonpost.com/energy-environment/2018/11/23/major-trump-

administration-climate-report-says-damages-are-intensifying-across-country/?noredirect=on&tid=a_inl_manual&utm_term=.2d0d90492490.

Nakamura, David, and Darryl Fears. 2018. *Trump administration resists global climate efforts at home, overseas.* December 10. Accessed June 19, 2020. https://www.washingtonpost.com/politics/trump-administration-resists-global-climate-efforts-at-home-overseas/2018/12/09/b94a9ef0-fa41-11e8-863c-9e2f864d47e7_story.html?utm_term=.c43b633e0c5b.

Office of the Spokesperson. 2019. *U.S. Delegation to the 25th Session of the Conference of the Parties to the UNFCCC.* November 30. Accessed July 8, 2020. https://www.state.gov/u-s-delegation-to-the-25th-session-of-the-conference-of-the-parties-to-the-un-framework-convention-on-climate-change/.

Oreskes, Naomi, and Erik M Conway. 2010. *Merchants of Doubt: How a Handful of Scientists Obscured the Truth on Issues from Tobacco Smoke to Global Warming.* New York: Bloomsbury Press.

Pew Research Center. 2015. *U.S. Public Becoming Less Religious.* Pew Research Center.

Pooley, Eric. 2010. *The Climate War.* New York: Hachette Books.

n.d. "Principles Governing IPCC Work, Article 2."

Revelle, Roger, and Hans E. Suess. 1957. "Carbon Dioxide Exchange Between Atmosphere and Ocean and the Question of an Increase of Atmospheric CO2 during the Past Decades." *Tellus* 9 (1): 18-27.

Rubin, Edward L. 2016. "Rejecting Climate Change: Not Science Denial, But Regulation Phobia." *Journal of Land Use & Environmental Law* 32 (1): 103-150.

Ruffini, Pierre-Bruno. 2018. "The Intergovernmental Panel on Climate Change and the Science-Diplomacy Nexus." *Global Policy* (University of Durham and John Wiley & Sons, Ltd) 9 (3). Accessed July 3, 2020.

Scientific Integrity Act . n.d. "S.775 — 116th Congress (2019-2020) / H.R.1709 — 116th Congress (2019-2020)."

Shaw, Henry. 1979. "Inter-Office Correspondence, Subject: Research in Atmospheric Science." *Exxon.* November 19.

Shogren, Elizabeth, and Najib Aminy. 2019. "Scuttling Science." *Reveal.* Edited by Brett Myers and Taki Tel. Reveal and the Center for Investigative Reporting. September 14. Accessed June 19, 2020. https://www.revealnews.org/episodes/scuttling-science/.

Stahl, Lesley. 2018. *President Trump on Christine Blasey Ford, his relationships with Vladimir Putin and Kim Jong Un and more.* October 15. Accessed June 19, 2020. https://www.cbsnews.com/news/donald-trump-full-interview-60-minutes-transcript-lesley-stahl-2018-10-14/.

Stocker, T.F., D. Qin, G.-K. Plattner, M. Tignor, S.K. Allen, J. Boschung, A. Nauels, Y. Xia, V. Bex and P.M. Midgley (eds.). 2013. *IPCC, 2013: Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change.* Cambridge: Cambridge University Press.

Teirstein, Zoya. 2020. *The 2020 Republican platform: Make America 2016 again.* June 17. Accessed July 6, 2020. https://grist.org/politics/the-2020-republican-platform-make-america-2016-again/.

The Associated Press-NORC Center for Public Affairs Research. 2014. *American Attitudes about Global Warming and Energy Policy.* The Associated Press and NORC.

The Royal Society and The American Association for the Advancement of Science. 2010. *New Frontiers In Science Diplomacy: Navigating the Changing Balance of Power.* The Royal Society and The American Association for the Advancement of Science, London: The Royal Society. Accessed May 15, 2020.

Thwaites, Joe. 2020. *2020 Budget Shows Progress on Climate Finance, But US Continues to Fall Behind Peers.* January 30. Accessed May 25, 2020. https://www.wri.org/blog/2020/01/2020-budget-shows-progress-climate-finance-us-continues-fall-behind-peers.

Trump, Donald J. 2012. *Tweet.* November 6. Accessed June 19, 2020. https://twitter.com/realDonaldTrump/status/265895292191248385?ref_src=twsrc%5Etfw

%7Ctwcamp%5Etweetembed%7Ctwterm%5E265895292191248385&ref_url=https%3A%2F%2Fwww.snopes.com%2Ffact-check%2Fdonald-trump-global-warming-hoax%2F.

Turekian, Vaughan. 2018. "The Evolution of Science Diplomacy." *Global Policy* 9 (3). Accessed June 12, 2020.

U.S. Department of State. n.d. *US Science Envoy Program.* Accessed July 1, 2020. https://www.state.gov/programs-office-of-science-and-technology-cooperation/u-s-science-envoy-program/.

U.S. Senate Environment and Public Works Committee Minority Staff Report (Inhofe). 2008. *U. S. Senate Minority Report: More Than 650 International Scientists Dissent Over Man-Made Global Warming Claims Scientists Continue to Debunk "Consensus" in 2008.* U.S. Senate Minority Report, US Senate.

USAID. 2019. *Environment and Global Climate Change.* May 7. Accessed July 8, 2020. https://www.usaid.gov/what-we-do/environment-and-global-climate-change.

Vidal, John. 2005. *Revealed: how oil giant influenced Bush.* Accessed May 24, 2020. https://www.theguardian.com/news/2005/jun/08/usnews.climatechange.

Volcovici, Valerie. 2016. *United States delivers first payment to global climate fund.* March 8. Accessed June 23, 2020. https://www.reuters.com/article/us-climatechange-un-usa-idUSKCN0WA090.

We Are Still In . n.d. *About.* Accessed May 24, 2020. https://www.wearestillin.com/about.

Westerman, Ashley. 2019. *'We Need Support': Pacific Islands Seek Help And Unity To Fight Climate Change.* October 5. Accessed June 17, 2020. https://www.npr.org/2019/10/05/764570478/we-need-support-pacific-islands-seek-help-and-unity-to-fight-climate-change.

Zogby International . 2004. *Impressions of America: How Arabs View America, How Arabs Learn About America.* Washington, DC: Zogby International.