

Impacts of United States Withdrawal from the Paris Climate Agreement

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ABSTRACT

In June 2017, United States President Donald Trump announced the country's withdrawal from the Paris Climate Agreement. This statement understandably caused a great deal of concern in the environmental community. Although the withdrawal would not take effect until 2020, the Agreement's entirely voluntary nature meant that the US would effectively be a non-participant from 2017. This study examines the impacts of US withdrawal in three realms: (1) climate finance, (2) greenhouse gas (GHG) emissions, and (3) international relations. I collected and analyzed official statements and data released by the Green Climate Fund, the EPA, and 36 national governments and intergovernmental organizations to determine whether predictions about the impacts were consistent with reality. My study found that the Green Climate Fund's initial resource mobilization in 2014 experienced a 19.4% funding shortfall, but the next round of pledges in 2019 made up the difference despite US non-engagement. US net GHG emissions increased by 0.59% in 2017-19, in contrast with a steady decline during the prior decade, though the absolute amount still remained below 1994 levels. A majority of governmental responses lamented U.S. withdrawal and reiterated their support for the Agreement, with no feared domino effect manifesting. Overall, US withdrawal negatively impacted the areas analyzed, but was mitigated by international momentum, domestic non-federal action, economic factors, and the 2020 election. Though the future of the Paris Climate Agreement is still uncertain, the results of this study bode well, demonstrating the increasing momentum behind the Agreement as well as its resilience against challenges.

KEYWORDS

global environmental governance, climate change, treaty withdrawal, United States
environmental policy, greenhouse gas emissions

INTRODUCTION

On December 12th, 2015, 197 countries signed the Paris Climate Agreement, an international treaty related to climate change mitigation and prevention (Denchak 2018). Coming on the heels of the disappointing Kyoto Protocol, the Paris Climate Agreement aimed to replace the previous environmental regime with a regime that was both fairer and more effective (Keohane and Oppenheimer 2016). The initial reception was largely positive: the United States and Canada, which had respectively refused to join and withdrawn from the Kyoto Protocol, were both active members, and developing countries submitted Nationally Determined Contributions (NDCs) for reducing carbon emissions alongside developed countries. Yet, just two years into its reign, the efficacy of the new Paris regime has been cast into doubt.

In June 2017, United States President Donald Trump announced that the US planned to withdraw from the Paris Climate Agreement, in accordance with his campaign pledge (Trump 2017). The United States would no longer be opting to work towards the goal of limiting global temperature rises within the Paris framework, though the president did state, “the United States, under the Trump administration, will continue to be the cleanest and most environmentally friendly country on Earth.” The national government had also previously pledged an initial contribution of \$3 billion to the Green Climate Fund, of which only \$1 billion has been paid (Saad 2018). Had the US remained in the Agreement, the country would have been expected to renew this pledge every four years, and even to increase it over time (Green Climate Fund 2019). The withdrawal means that the Green Climate Fund lost \$2 billion of its anticipated initial funds, of the total \$10.3 billion that was pledged (Green Climate Fund 2020). The United States is the world’s second largest greenhouse gas emitter (Olivier and Peters 2020) and a powerful actor on the international stage; will its withdrawal prove disastrous to the fledgling Paris Climate Agreement?

The situation is more complicated than that, but at least does not appear immediately disastrous. Due to a provision, countries must remain a party for three years before they are

allowed to leave, and the United States technically did not leave the Paris Climate Agreement until 2020 (Chestnoy and Gershinkova 2017). However, obligations under the Agreement are largely voluntary other than the yearly reporting requirement (for instance, the US has legally withdrawn its funding pledge), so the US has not been a proactive participant since 2017. On the flip side, a number of public and private sector actors, including 30 state governors, have declared their intention to remain a part of the Agreement regardless of US participation, which lessens the impact of effective withdrawal by the national government (Bordoff 2017); though their continued participation is concentrated in the first part of the Agreement, sidestepping fiscal issues like the Green Climate Fund. Meanwhile, the public, media, and international responses to the withdrawal range from proclamations of doom to gratified delight (Graceffo 2017). Amongst all this contradictory discourse and confusing causation, a concerned member of the public may have difficulty answering a very important question: what has been the actual impact of US withdrawal from the Paris Climate Agreement?

My research will examine the impacts from three aspects: climate finance, greenhouse gas emissions, and international relations. My working hypothesis is that climate finance and international reputation are negatively affected, but greenhouse gas emissions are not affected. Many entities in the US have declared their intent to stay in the Paris Climate Agreement regardless, lessening the impact. In addition, the Paris Climate Agreement is non-binding anyways, so the difference between the US staying in with a business-as-usual NDC and the US withdrawing is mostly symbolic. But financially, the impact is not symbolic, since no American parties have shouldered responsibility for the United States' previous promise to provide regular funding for the Green Climate Fund. With regards to international relations, backing out of an Agreement the government previously signed off on can be expected to draw widespread criticism, but the academic literature is clear in its prediction that the costs are more likely to be purely reputational rather than substantial (Böhringer and Rutherford 2017, Keohane and Oppenheimer 2016). For the next step, I will use qualitative and quantitative data to answer the questions for these three aspects, by accessing EPA emissions data, official governmental statements, academic literature, and news media reports.

Historical context

Global collaboration on climate change issues officially took form with the United Nations Framework Convention on Climate Change, an international treaty that went into effect in 1994 (Chestnoy and Gershinkova 2017). The treaty now encompasses 196 participating nation-states working towards the mutual goal of regulating anthropogenic greenhouse gas (GHG) emissions, with obligations such as submitting a yearly inventory of greenhouse gas emissions. Its successor, the Kyoto Protocol, was an important step towards that goal, but met with less success. Although 192 parties joined, only 40 developed nations were committed to specific, individual action, and the United States' refusal to ratify and Canada's withdrawal both dealt heavy blows to the Protocol's legitimacy and effectiveness. After nearly a decade of lessons learned and careful negotiations, the UNFCCC's 21st Conference of the Parties (COP21) produced a new treaty: the Paris Climate Agreement.

Paris Climate Agreement

The Paris Climate Agreement has several main pieces that aim to foster global cooperation on climate change (Keohane and Oppenheimer 2016). First, it set a goal for the world to collectively limit global temperatures rises to 1.5 to 2.0 degree Celsius, with each participant setting their own Nationally Determined Contribution (NDC) and reporting on progress every year. Second, it set up a framework for collaborative climate change mitigation and prevention, creating tools such as the Sustainable Development Mechanism. Third, the Agreement strives to ensure sufficient financing for countries to achieve their climate-change related goals, in particular forming the Green Climate Fund, which set the goal of raising \$100 billion for to climate change adaptation projects in developing countries.

Overall, the Paris Climate Agreement's main purpose is to provide a framework for parties working towards a common goal, rather than imposing specific obligations on specific parties (Chestnoy and Gershinkova 2017). The Agreement uses language such as "the Parties

should” instead of the “the Parties shall,” so that its terms are not binding obligations, but recommendations. Under Paris’ pledge-and-review system, countries decide their own NDCs, contributions to the Green Climate Fund are entirely voluntary, and NDC violations are not punished.

At first glance, the Paris Climate Agreement’s nonbinding nature appears to make it inferior to the Kyoto Protocol, whose terms are legally binding. However, Paris’ pledge-and-review system means that countries are more willing to join, and quicker to join: the Agreement had 197 signatory countries, most of which ratified it within a year. Keohane and Oppenheimer (2016) discusses the pros and cons of the Agreement’s pledge-and-review system, demonstrating that the system remedies the primary weaknesses of the previous targets-and-timetables system of Kyoto. Meanwhile, Lewinski and Mohammed (2019) examined official statements from key participating countries and found that the Agreement is the result of a fragile consensus, supporting the idea that a more binding agreement would likely not have received such widespread adoption. The Paris Climate Agreement also incorporates more space for non-nation-state stakeholders to contribute than the Kyoto Protocol, which reduces the effects of a certain nation’s withdrawal if non-governmental stakeholders within that country still wish to participate (Pickering et. al. 2018).

Still, whether Paris can be more effective at cutting greenhouse gas emissions than Kyoto remains to be seen. Dong et al. (2018) used the 1991-2015 emissions trends of the top ten carbon dioxide emitting countries, including the US, to predict their likelihood of fulfilling INDC targets (Dong et al. 2018). The study found that 7 of the 10 countries, including the US, would likely fall short of their INDC targets, while 3 would fulfill their targets in some scenarios. Keohane and Oppenheimer (2016), too, emphasizes that the Paris Climate Agreement’s effectiveness is contingent upon international transparency and domestic support.

US withdrawal

In the context of the Paris Climate Agreement, what does it mean for the United States

to withdrawal? First, we must clarify the date of withdrawal. By law, since the US officially accepted the Agreement (unlike the Kyoto Protocol, which was signed but never ratified), the country must wait 3 years after the Agreement comes into effect to officially announce its withdrawal, and a full year after that for the withdrawal to officially come into effect (Chestnoy and Gershinkova 2017). Therefore, the official date of US withdrawal from the Paris Climate Agreement did not occur until November 4, 2020. In theory, the United States was still eligible to participate in international forums, submit NDCs, and contribute to the Green Climate Fund until that date. However, since the Agreement is entirely non-binding, the US's proactive participation in those processes ended much earlier. For the purposes of this thesis, I decided to use June 1, 2017, as the date on which the national government publicly announced its intention of withdrawing and thus effectively ceased to act as an active participant.

Certainly, the public announcement in June 2017 served as a major focusing event for interested parties to comment on the subject. Critics defended the Paris Climate Agreement's legitimacy, lamented the lost opportunities for US to become a global environmental leader, and prophesized the various ways withdrawal would harm the US and the world. Supporters accused the Agreement of being unfair, commended the US for putting its own people first, and supported the motion to negotiate a new agreement (Zycher 2017; Graceffo 2017). Still other commenters held that participation or non-participation would have little effect either way (Atkin 2017). Interestingly, while all three sides were well represented in the media commentary, I did not find a single scholarly journal article espousing a mostly positive view of US withdrawal, with all the academic literature I found trending either neutral or negative.

METHODS

To determine the impact of US withdrawal from the Paris Climate Agreement, I examined and analyzed data and literature in three different realms, (1) climate finance, (2) greenhouse gas (GHG) emissions, and (3) international relations.

To assess direct financial impacts, I looked up official statements and data released by

the Green Climate Fund to find out how much money the US was planning to contribute to the Green Climate Fund and how large this amount was in proportion to the Fund's total funding. I also compared the GCF's first and second rounds of fundraising to determine whether future fundraising was negatively affected by the US's example in a domino effect.

To assess GHG emission impacts, I analyzed US GHG net emissions data from the EPA's official GHG inventories. At the time of this study, the 2019 inventory is still in its draft form, so the estimate for 2019 net emissions may be revised in the future. I calculated the percentage change in net emissions each year. Next, I compared the net emissions and percentage changes before and after 2017, with 2017 itself included in "after," to determine whether net emissions changed after the withdrawal announcement. In order to control for yearly fluctuations, I also ran this procedure for 3-year rolling averages of the net emissions.

To assess the international relations impact of US withdrawal, I found official governmental statements and press releases from national governments of other countries responding to the withdrawal. I classified each government's response as positive, neutral, or negative towards the US's actions, noted when a country leveled sanctions in response, and determined whether the country remained part of the Paris Climate Agreement. I summarized each of these axes as a percentage breakdown. I also found which countries are not part of the Paris Climate Agreement, and the circumstances of their nonmembership, to determine if any countries followed the US's example in withdrawing.

Literature searches

In order of priority, my literature searches focused on three main types of sources: academic, official, and media. For each of these, I ran iterative searches with relevant keywords, making sure to check all variants on the term "Paris Climate Agreement," such as "Paris Accord" or "Paris Climate Agreement." For academic sources, I mainly used the UC Berkeley library database and Google Scholar to search for relevant journal articles and review papers, taking note of paper topic, publication date, and author credentials especially. For official sources, I

found press releases, governmental statements, and official webpages released directly by the relevant government, governmental agency, or intergovernmental organization where possible. In some cases, I was unable to find a direct governmental source, so I used secondary sources such as newspaper articles reporting on direct quotes from important governmental officials. For media sources, I usually used media articles to orient myself to the issue at hand, so that I had a better idea of which academic or official sources to look for. In some cases, though, the issue was so recent that only media sources were available. For example, very few academic or official sources have commented on the new US president Joe Biden's prospective actions with regard to the Green Climate Fund, whereas a plethora of newspaper articles, blogs, and non-profit websites have released relevant commentary.

RESULTS

Climate finance: sufficient or insufficient?

I found that the Green Climate Fund experienced a shortfall in expected funding from 2017 to 2020 to the amount of \$2 billion, with the US budget correspondingly spending that much less money. Under the Paris Climate Agreement, the United States was planning to contribute \$3 billion to the Green Climate Fund in 2017, of which only \$1 billion was transferred. Although many US cities and states stated their intent to remain in the Agreement, none made direct contributions to the GCF (Green Climate Fund 2020), possibly because the US Constitution restricts foreign powers to the federal government only (United States Federal Government 1787). Altogether, the GCF received contributions of \$8.4 billion instead of the anticipated \$10.4 billion. My findings only fit partially with my hypothesis that green climate funding shortages would be a significant impact. On the one hand, the GCF experienced a shortage amounting to 19.4% of its total anticipated contributions (Green Climate Fund 2020). On the other hand, the GCF's fundraising goal is \$100 billion a year, so in that respect the withdrawn contributions only put the GCF 0.5% further from its goal.

I also found that the GCF soon made up the shortfall resulting from US withdrawal, further challenging my hypothesis. No countries raised their pledges immediately following the US announcement, but over 80% did do so in the second round of GCF resource mobilization in 2019 (Green Climate Fund 2021), in which the GCF raised \$10.0 billion in pledges despite the US announcing in 2019 that it would not contribute. More than half of all contributors even doubled their contributions, providing evidence against the view that US withdrawal would encourage other countries to lessen their commitments to green finance. Also, the US current president Joe Biden announced during his campaign that he planned to fulfill the outstanding \$2 billion pledge to the GCF. If the US contributes a full \$8 billion like some green organizations are calling for, that would raise the total pledges for GCF-1 by a whopping 80%, though it still only brings the GCF a measly 2.0% closer to its ambitious \$100 billion-a-year goal.

Greenhouse gas emissions: increase or decrease?

The simple answer is that US net greenhouse gas emissions (GHG) increased after 2017. Taken altogether, net emissions increased by 0.59% overall in the three years after 2017, though it is worth noting that in absolute terms, net emissions in 2017-19 were still the lowest since 1994 (Figure 1). 3-year rolling averages exhibit a similar trend: net emissions increased by 0.21% from 2016 to 2018, but were the lowest since 1993 (Figure 2).

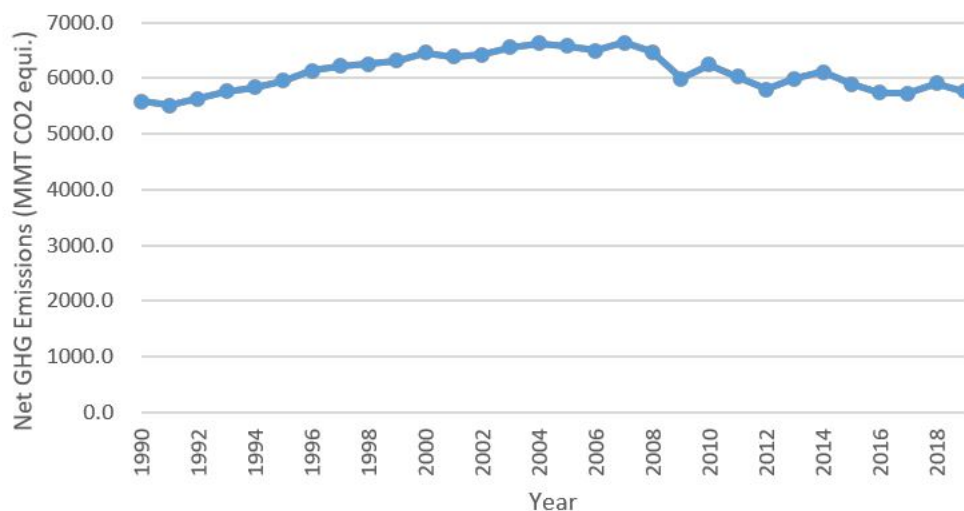


Figure 1. US net greenhouse gas emissions, 1990-2019.

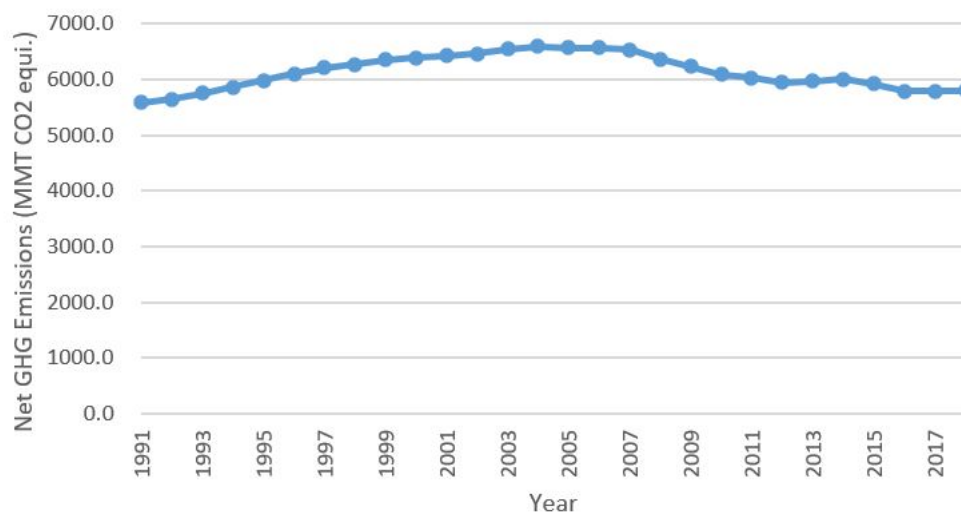


Figure 2: 3-year rolling averages for US net greenhouse gas emissions, 1991-2018.

In contrast with my hypothesis, net emissions in the US did not exhibit the same trend before and after 2017. Just comparing percentage change per year for net emissions, the data does not follow different trends before and after 2017. However, percentage change per year for 3-year rolling averages exhibit clear differences in whether the value was negative or positive. This data can be divided into three phases, each with different trends (Figure 4). From 1991 to 2004, changes were always positive for an average of +1.29% change each year. From 2005 to 2016, changes were mostly negative, for an average of -1.07% change each year. From 2017 to 2018, though, the changes were positive each year, for an average of +0.10% change each year. Thus, rolling averages increased in the first phase, decreased in the second phase, then increased at a slower rate than before in the third phase.

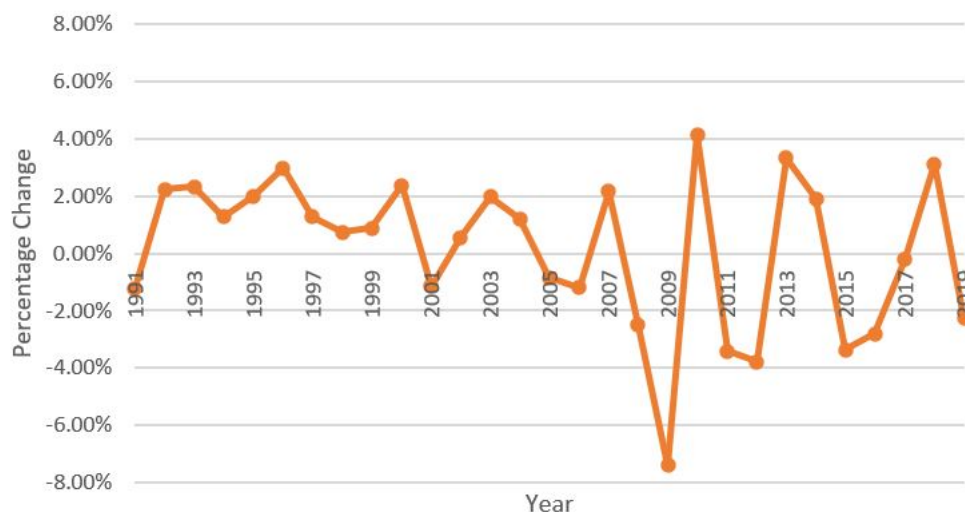


Figure 3: Percentage changes each year in US net greenhouse gas emissions, 1990-2019.

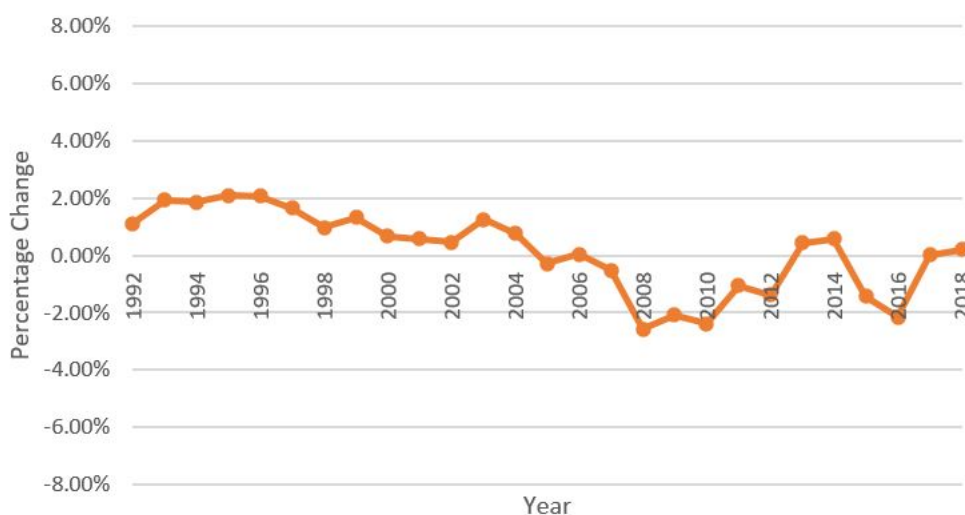


Figure 4: Percentage changes each year in rolling averages for US net greenhouse gas emissions, 1990-2019.

International relations: America first or America last?

I collected official governmental reactions from 30 individual countries and 6 country groups that each represent at least 20 countries, with some overlap, for a total of 36 entities (Appendix B). Most statements were released in the month immediately following the US announcement on June 1, 2017, though a second round of statements (largely reiterating the points made in the prior round) were released in November 2019 when the US submitted its

formal letter of withdrawal to the UNFCCC.

All of the entities held negative stances on U.S. withdrawal, except for Russia (neutral), India (neutral), Panama (neutral), and Poland (positive) (Figure 5). Most entities expressed some variant of disappointment or regret, with a few choosing more vehement language, like Belgium which called the withdrawal “a brutal act,” and North Korea which called the U.S. president “selfish.” Poland’s deputy minister of energy praised U.S. withdrawal, but the country remains a party to the Agreement itself. Although the neutral parties, Russia, India, and Panama refrained from directly commending or criticizing the U.S.’s withdrawal, they did release statements supporting the Paris Climate Agreement (World is One News 2017).

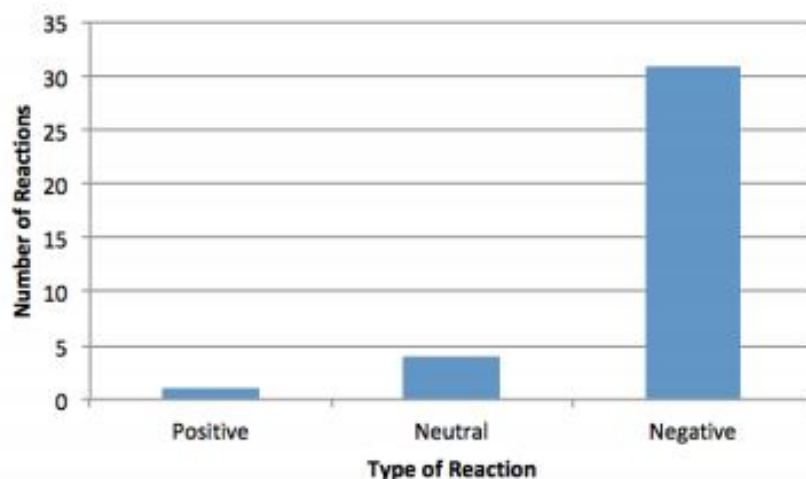


Figure 5: Governmental Reactions to US Withdrawal

Regarding the Paris Climate Agreement, 23 entities (64%) reaffirmed their commitment to and support of the Agreement, while the remaining 13 (36%) did not directly mention doing so, sticking to more general statements about the importance of fighting climate change (Figure 4). No entities stated that U.S. withdrawal would weaken their commitment to the Agreement, though some, like Russia, noted that the Agreement would be weaker as a result. All entities that released a statement remain part of the Paris Climate Agreement. I found that foreign policy action towards the US in response to US withdrawal from the Paris Climate Agreement was limited to press releases, joint statements, and other symbolic actions, consistent with

predictions from the existing literature and with my hypothesis. No entities imposed sanctions upon the US or opened official talks with the US about renegotiating the Agreement. Multiple entities urged the U.S. to rejoin the Agreement.

DISCUSSION

US President Donald Trump's announcement of US withdrawal in June 2017 understandably caused a great deal of concern in the environmental community. Would climate finance be affected? Would climate change be exacerbated? Would US inaction inspire climate laggards around the world to follow its example? US withdrawal appears to have had a negative effect, but smaller than many people expected, and not significant enough to set back the Paris Climate Agreement permanently. Of the three aspects studied, the GCF's climate finance experienced a funding shortage amounting to 19.4% of its total anticipated contributions in 2014, but the next round of pledges made up the difference despite US non-engagement. US greenhouse gas emissions increased by 0.59% possibly due to multiple changes to US federal environmental policies like the Clean Air Act. Other countries were almost universal in lamenting US withdrawal, but the anticipated "domino effect" of other countries following the US example was limited to nonexistent.

Climate finance: sufficient or insufficient?

The Green Climate Fund lost approximately a fifth of pledged funds, likely leading to a corresponding cutback of its projects. The GCF's agenda is to "support developing countries [in raising] and [realizing] their Nationally Determined Contributions (NDC) ambitions" (Green Climate Fund n.d.). For example, Project FP107 (classified by the GCF as "medium") promotes climate resilience in Bhutan's agricultural sector. In the 7 years since its initial resource mobilization, the GCF has approved 173 climate change adaptation and mitigation projects for a total value of \$30.3 billion (including co-financing), of which \$8.4 billion is to

be allocated by the GCF. The 19.4% funding shortfall would translate to roughly 50 medium-sized projects being canceled or delayed due to lack of funds. Saad 2018 lists rescinded climate funding for vulnerable communities as one of the four main long-term harmful consequences of US withdrawal (Saad 2018). Some commentators feared a domino effect of other countries using the US as an excuse to rescind or decrease their GCF contributions (Chestnoy and Gershinkova 2017), but the opposite trend appears during GCF-1, the second round of GCF funding mobilization in 2019.

Greenhouse gas emissions: increase or decrease?

Since the mid-2000s, US GHG emissions have been steadily decreasing due to mainly economic reasons. In particular, coal consumption has consistently declined due to its decreased economic viability compared to natural gas and renewables, with cheap shale gas widely available and renewable technological advances reducing their cost (Bordoff 2017). However, the fall in US emissions slowed and even slightly reversed after the US's announced withdrawal in 2017, which would not put the country on track to achieve its prior NDC of 25% emission cuts by 2025. This change may be related to the Trump administration rolling back many environmental regulations during its term.

In January 2021, the newly inaugurated US president Joe Biden announced the US's return to the Paris Climate Agreement (Osaka 2021). However, even with US reentry, is the current global action enough to prevent and mitigate climate change? Several studies project that even if all countries fulfilled their current NDCs, the resulting emission cuts would not be enough to avert 2 degrees Celsius of warming and the corresponding catastrophic levels of climate change (Rogelj et al. 2016, Herz 2019, Wilder et al. 2017). Other studies show that most major emitters are not even on track to fulfill their existing NDCs (Dong et al. 2018; Elzen et al. 2019). And even if the world achieves their optimistic goal of 1.5 degrees Celsius, that scenario would *still* carry heavy economic, environmental, and humanitarian costs (Masson-Delmotte 2019). Is humanity doomed regardless of US participation in Paris?

International relations: America first or America last?

For the US, withdrawal appears to have led to reputational, relationship, and leadership costs. These costs are less tangibly and quantifiably measurable than effects in the other areas, but they are also likely to be the most “sticky,” possibly persisting long after the US recommits itself and changes its approach to climate change (Zhang et al. 2017). The possibility of yet another administration change occurring following an election looms in people’s minds, as does the possibility of a difference in opinion between the executive, legislative, and judicial branches. Meanwhile, the rest of the international community has carried on. Trump stated that the US was willing 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” (Trump 2017), but so far no such negotiation has formally taken place. And with the recent change of administration, the U.S. has initiated procedures to reenter the Paris Climate Agreement, in its current form rather than a renegotiated version (Cho 2021).

Limitations and future directions

This study has several limitations. To begin with, the period of 2017-2020 contained potential confounding factors, such as the COVID pandemic, which caused economies worldwide to slow down. In addition, this study may not represent the entire body of literature on this topic, as my research only focuses on three key aspects. Future studies may look at some of the arenas I did not focus on like economic impacts, but more importantly, they will have the opportunity to study where Paris Climate Agreement goes in the future. Significantly, the 26th UN Climate Change Conference of the Parties (COP 26) is at the time of this study scheduled to take place in November 2021, and the US is expected to announce its new NDC at that time. And in 2024, US will undergo yet another presidential election, raising the possibility of an administration that reconfigures federal environmental policies yet again.

Additionally, changes to the makeup of Congress and the Supreme Court will affect the scope of any national environmental policies, and public momentum matters too.

Broader implications

US withdrawal negatively impacted the three areas analyzed, but was mitigated by international momentum, domestic non-federal action, economic factors, and the 2020 election. Meanwhile, international momentum remained strong, demonstrating the resilience and strength of the Paris Climate Agreement. To prevent a similar turnaround following an administration change in the future, the Biden administration could attempt to push changes through Congress and the Supreme Court. For instance, the Trump administration was unable to withdraw the US from the UNFCCC because that treaty was approved by a two-thirds majority of the Senate, and withdrawing would require the same majority to be in favor (Chestnoy and Gershinkova 2017).

Although the future of the Paris Climate Agreement is still uncertain, the results of this study bode well, demonstrating the increasing momentum behind the Agreement as well as its resilience against challenges. The Paris Climate Agreement is structured to enable and encourage countries to ratchet up their ambitions and contributions with each round of NDCs and resource mobilizations (Keohane and Oppenheimer 2016). We do indeed see this trend with climate finance contributions and the number of member countries, though NDC fulfillment has not undergone enough cycles of measurement to determine the trend, with the IPCC slotted to finish its Sixth Assessment cycle in 2022. Predictions of a resulting domino effect proved unfounded: the US withdrawal received largely negative responses from nations around the world, and even the sole supporter, Poland, remained an active member which submitted an NDC and contributed to the GCF (Green Climate Fund 2020).

The Agreement's "easy to (re)enter, hard to leave" design meant that while the US took over three years to officially exit, reentry took effect only a month after Biden took office. Next, the Biden administration will need to address the gaps left by previous US non-participation in

climate finance, greenhouse gas emission cuts, and international environmental leadership, while the international community figures out exactly how far to trust the US's promises this time (Bodansky 2021; Cho 2021; Osaka 2021).

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REFERENCES

- Atkin, E. 2017, June 1. Leaving the Paris Agreement Won't Doom the Planet. *The New Republic*.
- Bodansky, D. 2021. Climate Change: Reversing the Past and Advancing the Future. *American Journal of International Law* 115:80–85.
- Böhringer, C., and T. Rutherford. 2017. Paris after Trump: An Inconvenient Insight. SSRN Scholarly Paper, Social Science Research Network, Rochester, NY.
- Bordoff, J. 2017. Withdrawing from the Paris climate agreement hurts the US. *Nature* 2:1–3.
- Chestnoy, S., and D. Gershinkova. 2017. USA Withdrawal from Paris Agreement – What Next? *International Organisations Research Journal* 12:215–225.
- Cho, R. 2021, February 4. The U.S. Is Back in the Paris Agreement. Now What? - Biden-Harris Administration.
- Denchak, M. 2018, December 12. Paris Climate Agreement: Everything You Need to Know. Natural Resources Defense Council.
- Dong, C., X. Dong, Q. Jiang, K. Dong, and G. Liu. 2018. What is the probability of achieving the carbon dioxide emission targets of the Paris Agreement? Evidence from the top ten emitters. *Science of The Total Environment* 622–623:1294–1303.

- Elzen, M. den, T. Kuramochi, N. Höhne, J. Cantzler, K. Esmeijer, H. Fekete, T. Fransen, K. Keramidas, M. Roelfsema, F. Sha, H. van Soest, and T. Vandyck. 2019. Are the G20 economies making enough progress to meet their NDC targets? *Energy Policy* 126:238–250.
- Faukner, R. 2017, June 5. Trump's withdrawal from the Paris Agreement: what next for international climate policy?
- Graceffo, A. 2017, July 13. The Impact of the US Withdrawing from the Paris Accords. *Foreign Policy Journal*.
- Green Climate Fund. 2019, October 25. Countries step up ambition: Landmark boost to coffers of the world's largest climate fund. Text, Green Climate Fund. <https://www.greenclimate.fund/news/countries-step-ambition-landmark-boost-coffers-world-s-largest-climate-fund>.
- Green Climate Fund. 2020, November 6. Initial Resource Mobilisation. Text, Green Climate Fund. <https://www.greenclimate.fund/about/resource-mobilisation/irm>.
- Green Climate Fund. 2021, January 15. GCF-1. Text, Green Climate Fund. <https://www.greenclimate.fund/about/resource-mobilisation/gcf-1>.
- Green Climate Fund. 2021, January 15. GCF-1. Text, Green Climate Fund. <https://www.greenclimate.fund/about/resource-mobilisation/gcf-1>.
- Green Climate Fund. (n.d.). Resource Mobilisation. Text, Green Climate Fund. <https://www.greenclimate.fund/about/resource-mobilisation>.
- Herz, S. 2019. Paris Is Not Enough: Why the Paris Agreement Isn't Driving More Climate Action...and How It Could. Social Science Research Network.
- Keohane, R. O., and M. Oppenheimer. 2016. Paris: Beyond the Climate Dead End through Pledge and Review? *Politics and Governance* 4:142–151.
- Masson-Delmotte, V., P. Zhai, H.-O. Pörtner, D. Roberts, P. R. Shukla, and J. Skea. 2019. Global Warming of 1.5 °C: An IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty. IPCC.
- Olivier, J. G. J., and J. A. H. W. Peters. 2020. Trends in global CO₂ and total greenhouse gas emissions: 2019 Report. PBL Netherlands Environmental Assessment Agency, The Hague.
- Osaka, S. 2021, January 20. Biden just put the US back in the Paris Agreement. Now the pressure is on. *Grist*.
- Pickering, J., J. S. McGee, T. Stephens, and S. I. Karlsson-Vinkhuyzen. 2018. The impact of the US retreat from the Paris Agreement: Kyoto revisited? *Climate Policy* 18:818–827.

- Rogelj, J., M. den Elzen, N. Höhne, T. Fransen, H. Fekete, H. Winkler, R. Schaeffer, F. Sha, K. Riahi, and M. Meinshausen. 2016. Paris Agreement climate proposals need a boost to keep warming well below 2 °C. *Nature* 534:631–639.
- Saad, A. 2018. Pathways of Harm: The Consequences of Trump’s Withdrawal from the Paris Climate Agreement. *Environmental Justice* 11:47–51.
- Su, X., and F. Teng. 2019. The effects of U.S. withdrawal from the Paris Agreement on global GHGs emissions. *Advances in Climate Change Research* 15:74.
- Trump, D. J. 2017, June 1. Statement by President Trump on the Paris Climate Accord. <https://www.whitehouse.gov/briefings-statements/statement-president-trump-paris-climate-accord/>.
- United States Federal Government. 1787. Constitution of the United States. Article I, Section 10.
- Wilder, R., D. Kammen, and C. Wilder. 2017. Pulling Out of Paris: Why the United States’ Withdrawal Will Not Much Matter - Journal Article - Stanford Law School. *Stanford Law & Policy Review* 29.
- World is One News. 2017. Indian PM Modi and French President Macron address media after holding talks.
- Zhang, Y.-X., Q.-C. Chao, Q.-H. Zheng, and L. Huang. 2017. The withdrawal of the U.S. from the Paris Agreement and its impact on global climate change governance. *Advances in Climate Change Research* 8:213–219.
- Zycher, B. 2017, June 2. Leaving Paris: One and a Half Cheers for President Trump.

APPENDIX A: Greenhouse Gas Emissions

Table A1. United States net GHG emissions data and calculations referenced in Figures 1-4, 1990-2019. Net emissions data was sourced from the US EPA's *Inventory of U.S. Greenhouse Gas Emissions and Sinks, 1990-2018*, except for 2019 net emissions which came from the *Draft Inventory of U.S. Greenhouse Gas Emissions and Sinks, 1990-2019*.

Year	Net Emissions (MMT CO ₂ Eq.)	Percent Change/yr	3-year Rolling Average (MMT CO ₂ Eq.)	Percent Change/yr
1990	5583.6	N/A	N/A	N/A
1991	5515.0	-1.23%	5578.7	N/A
1992	5637.6	2.22%	5640.3	1.10%
1993	5768.2	2.32%	5749.0	1.93%
1994	5841.3	1.27%	5855.7	1.86%
1995	5957.6	1.99%	5978.0	2.09%
1996	6135.2	2.98%	6102.1	2.08%
1997	6213.5	1.28%	6202.9	1.65%
1998	6260.0	0.75%	6262.7	0.96%
1999	6314.5	0.87%	6346.1	1.33%
2000	6463.8	2.36%	6389.3	0.68%
2001	6389.7	-1.15%	6426.2	0.58%
2002	6425.2	0.56%	6455.9	0.46%
2003	6552.9	1.99%	6536.9	1.25%
2004	6632.5	1.21%	6587.5	0.77%
2005	6577.1	-0.84%	6569.3	-0.28%
2006	6498.2	-1.20%	6571.4	0.03%
2007	6639.0	2.17%	6536.6	-0.53%
2008	6472.6	-2.51%	6368.2	-2.58%
2009	5992.9	-7.41%	6235.5	-2.08%
2010	6241.1	4.14%	6087.2	-2.38%
2011	6027.6	-3.42%	6022.6	-1.06%
2012	5799.2	-3.79%	5939.6	-1.38%
2013	5992.0	3.32%	5965.7	0.44%
2014	6106.0	1.90%	5999.6	0.57%
2015	5900.8	-3.36%	5914.0	-1.43%
2016	5735.1	-2.81%	5786.7	-2.15%
2017	5724.3	-0.19%	5787.5	0.01%
2018	5903.2	3.13%	5798.9	0.20%
2019	5769.1	-2.27%	N/A	N/A

APPENDIX B: National Government and Intergovernmental Organization Reaction**Sources**

African Union. 2017, June 3. Press Release on the commitments made at COP 21 by the African Union Heads of State and Government as well as the full and unconditional support of the Paris Climate Agreement on Climate Change.
<https://au.int/en/pressreleases/20170603/press-release-commitments-made-cop-21-african-union-heads-state-and>.

Carbon Brief Staff. 2017, June 2. Global reaction: Trump pulls US out of Paris Climate Agreement on climate change. <https://www.carbonbrief.org/global-reaction-trump-pulls-us-out-paris-agreement-climate-change>.

Clarín reporters. 2017, June 1. Argentina “deeply” regretted the US decision to withdraw from the Paris Climate Agreement. Argentina lamentó “profundamente” la decisión de EE.UU. de retirarse del Acuerdo de París. Clarín.

CNN, B. B. W. 2017, June 2. Reluctant signatory India takes moral high-ground on Paris climate deal. CNN Digital.

Department of Environment, Forestry and Fisheries. 2017, June 2. Government reacts to United States of America’s withdrawal from Paris Climate Agreement.
<https://www.gov.za/speeches/government-reacts-united-states-america%E2%80%99s-withdrawal-paris-agreement-2-jun-2017-0000>.

EFE. 2017, June 1. Panama reaffirms its commitment to the Paris Climate Agreement after the US exit. Panamá reafirma su compromiso con el Acuerdo de París tras la salida de EEUU. Telemetro.

European Parliamentary Research Service. 2017. Paris Climate Agreement: United States withdrawal. Page 2. European Parliament.

French, S. 2017, June 7. North Korea calls out Donald Trump for being ‘selfish’ over the Paris climate deal. MarketWatch.

Gayoom, H. E. A. Y. A. 2017, June 2. Statement by H.E. Abdulla Yameen Abdul Gayoom, President of Maldives on the United States Withdrawal from Paris Climate Agreement.
<https://www.foreign.gov.mv/index.php/en/mediacentre/news/3904-statement-by-h-e-abdulla-yameen-abdul-gayoom,-president-of-maldives-on-the-united-states-withdrawal-from-paris-agreement>.

- Guy, B. 2017, June 9. Universal Backlash From Leaders on Trump's Paris Blunder. NRDC.
- Herrera, C. 2017, June 2. Latin America Climate Action Critical After US Paris Retreat. NRDC.
- Independent Association of Latin America and the Caribbean. 2017, June 3. Members of AILAC. Miembros de AILAC. Tweet.
- Johnston, I. 2017, June 2. Russia backs the Paris Climate Agreement on climate change as Donald Trump set to announce US decision. The Independent.
- Juncker, J.-C. 2017, June 14. Speech by President Juncker at the European Parliament on President Trump's decision to withdraw the U.S. from the COP 21 Climate Agreement. https://ec.europa.eu/commission/presscorner/detail/en/SPEECH_17_1647.
- New Zealand Herald. 2017, June 2. US withdrawal from Paris Climate Agreement "really disappointing" - Climate Change Minister Paula Bennett. New Zealand Herald.
- O Globo. 2017, January 6. Brazilian government says disappointed with US withdrawal from Paris Climate Agreement. Governo brasileiro se diz desapontado com saída dos EUA do Acordo de Paris. Jornal O Globo.
- Relman, E. 2017, June 2. Putin jokes about Trump's decision to pull US out of Paris Climate Agreement. Business Insider.
- Reuters Staff. 2017, June 1. France, Italy, Germany defend Paris Accord, say cannot be renegotiated. Reuters.
- Rutte, M. 2017, June 1. Minister-president Mark Rutte. https://www.facebook.com/story.php?story_fbid=1476766269051747&id=166039216791132.
- Secretary of Foreign Affairs. 2017, June 1. Mexico reaffirms its support and commitment to the Paris Climate Agreement to stop the effects of Global Climate Change. México reafirma su apoyo y compromiso con el Acuerdo de París para detener los efectos del Cambio Climático Global. <http://www.gob.mx/sre/prensa/mexico-reafirma-su-apoyo-y-compromiso-con-el-acuerdo-de-paris-para-detener-los-efectos-del-cambio-climatico-global>.
- Tan, A. 2017, June 2. Singapore reaffirms commitment to Paris climate agreement after US pulls out of pact. The Straits Times. Singapore.

Telegraph Reporters. 2017, June 2. Theresa May tells Donald Trump of “disappointment” over decision to pull out of Paris climate change accord. The Telegraph.

The Local. 2017, June 2. Trump’s climate agreement withdrawal “deeply regrettable”: Swedish Deputy PM. The Local. Sweden.

The Tico Times. 2017, June 2. Costa Rican government responds to Trump’s climate accords exit. The Tico Times. Costa Rica.

Trudeau, J. 2017, June 1. Statement by the Prime Minister of Canada in response to the United States’ decision to withdraw from the Paris Climate Agreement.
<https://pm.gc.ca/en/news/statements/2017/06/01/statement-prime-minister-canada-response-united-states-decision-withdraw>.

UK Department for Business, Energy & Industrial Strategy. 2020, November 4. Joint statement on US Withdrawal from the Paris Climate Agreement.
<https://www.gov.uk/government/news/joint-statement-on-us-withdrawal-from-the-paris-agreement>.

Walsh, A. 2017, January 6. World reacts to US withdrawal from Paris Climate Agreement | DW | 01.06.2017. Deutsche Welle.

World is One News. 2017. Indian PM Modi and French President Macron address media after holding talks.

Xi, J. 2017, January 19. Work Together to Build a Community of Shared Future for Mankind - Xinhua | English.news.cn. Xinhua Net. United Nations Office at Geneva.

Yaxley, L. 2017, June 2. Donald Trump’s decision “disappointing” but Australia still committed to Paris Climate Agreement, Malcolm Turnbull says - ABC News. ABC News.

Zackhras, M., F. Bainimarama, R. S. Bergman, and J. S. Filho. 2017, June 1. Joint Statement by group of High Ambition Coalition Ministers. High Ambition Coalition.