

Political Cleavages and Changing Exposure to Global Warming

Comparative Political Studies

2024, Vol. 0(0) 1–35

© The Author(s) 2024

Article reuse guidelines:

sagepub.com/journals-permissions

DOI: 10.1177/00104140241283014

journals.sagepub.com/home/cps**Alexander F. Gazmararian¹**  and **Helen V. Milner²** 

Abstract

Why do some countries pass laws to reduce emissions that cause climate change while others do not? We theorize that climate change-related disasters cause politicians to view global warming as more proximate, but whether they have incentives to enact mitigation laws depends on their country's geographic vulnerability to future damages. We use a spatial integrated assessment model to measure global warming's local economic effects, which allows us to predict how political leaders respond to disasters based on their vulnerability. An analysis of mitigation laws from 1990–2020 in 155 countries shows that only governments in locations facing the greatest future climate damage react to disasters by passing mitigation policies. Distinct from the historical North-South divide, our findings highlight a growing geographic cleavage in national responses to climate change.

Keywords

political economy, climate change, climate policy, mitigation, geography, vulnerability, policy adoption

¹Princeton University, Princeton, NJ, USA

²Princeton School of Public & International Affairs, Princeton, NJ, USA

Corresponding Author:

Alexander F. Gazmararian, Department of Politics, Princeton University, 001 Fisher Rd, Princeton, NJ 08544, USA.

Email: afg2@princeton.edu

Governments have pledged to pass laws that mitigate planet-warming emissions so the world can avoid climate change's worst impacts. Policy-makers and scholars consider developing countries the least likely candidates to pass such laws, given their lesser capacity, incentives to free ride, and domestic political obstacles (Keohane & Victor, 2016). Yet, low-income countries have enacted over 321 mitigation laws. These policies, though insufficient to solve global warming, have reduced emissions (Eskander & Fankhauser, 2020). Many wealthy countries, in contrast, have lagged in their commitments to mitigate emissions, and some are backtracking after public backlashes. Why do some countries enact policies to reduce emissions that cause climate change while others do not?

A prominent view is that global warming is a collective action problem (Barrett, 2003), but what this implies for policymaking is unclear without a model of mitigation's costs and benefits. Scholars have turned to domestic interests, institutions, and ideas, analyzing differences in electoral rules, regime type, and business-state relations across countries (Bättig & Bernauer, 2009; Cao et al., 2014; Finnegan, 2022b; Mildenberger, 2020). But static factors alone cannot explain change in mitigation policy. Dynamic explanations such as policy diffusion exist, but these theories often assume that countries share incentives to combat climate change (Ward & Cao, 2012).

Global warming, however, will have unequal economic effects across geographic locations, which could produce diverging political responses (Gaikwad et al., 2022; Sprinz & Vaahtoranta, 1994). Studies reach mixed findings about vulnerability's effect on policymaking (Dolšák, 2009; Genovese, 2020). This is unsurprising because the factors that render a country vulnerable, such as proximity to the coastline, do not vary much in the short- to medium-run, so they cannot explain the growth of mitigation laws. Theories that incorporate dynamics, such as revaluation of assets (Colgan et al., 2021), also do not fully capture geography's role in shaping climate change's economic effects, which spatial models emphasize.

We theorize that politicians' changing beliefs about when their countries will feel global warming's effects explain when they are likely to pass mitigation laws. Climate change begins as a distant, uncertain threat, which stalls action since the short-term costs loom large (Jacobs, 2016). After experiences with global warming such as disasters, political leaders view climate change as more proximate (Weber, 2006). When disasters are infrequent, leaders have little incentive to prevent climate change since citizens would resist paying costs (Bechtel & Scheve, 2013). As voters feel climate change's effects, leaders anticipate public demands for action, so mitigation's benefits increase relative to its costs (Fox & Van Weelden, 2015). We expect that politicians mitigate as they adapt since the two are not substitutes.

Global warming's geospatial effects lead us to argue that a *geographic* North-South cleavage is emerging. Regions in the Northern Hemisphere are

less exposed, may benefit in the long run from reallocated economic activity, and can afford adaptation. In contrast, those in the South are more vulnerable, face economic outflows, and lack the same capacity to adapt (Burke et al., 2015; Cruz & Rossi-Hansberg, 2024).

This inequality in vulnerability implies a political cleavage that differs from the previous emphasis on the Global North-South divide created by divergent economic development (Krasner, 1985; Roberts & Parks, 2007). Our geographic South includes countries such as Australia and parts of Southern Europe, while the North includes China. The countries within each region have not always cooperated but could see their interests align on climate change, while relations across the geographic divide may become increasingly conflictual.

We test our theory by examining climate mitigation law adoption across 155 countries from 1990 to 2020. These laws have reduced emissions, so they entail costs on average. We leverage climate change-related disasters to identify when politicians have incentives to mitigate. Estimates from a spatial economic model of global warming allow us to predict how leaders respond to disasters based on their climate vulnerability.

A challenge for identifying a causal relationship between disasters and mitigation policy is that there could be an omitted factor explaining policymaking, such as state capacity, that also correlates with disasters and vulnerability. We estimate the change in climate laws within the same country, which accounts for fixed differences across nations that could make them more responsive to disasters. We also control for variables such as gross domestic product that affect a state's ability to respond to disasters. Sensitivity analyses indicate that the results would be robust to an extreme confounder with more than double the correlation of oil production and the interaction of climate vulnerability and disasters.

We find that disasters cause only countries facing future global warming damage—mostly those in the geographic South—to pass more mitigation laws. Countries in the geographic North are not more likely to enact mitigation policies after disasters. A single disaster leads the average country in vulnerable damage zones to pass 0.22 more laws in a year. This increase contrasts with the conventional assumption that politicians respond to disasters with relief not prevention (Bechtel & Hainmueller, 2011; Healy & Malhotra, 2009).

Existing distributive politics and collective action theories do not explain our results. Controls capturing standard distributive explanations, such as fossil fuel production and CO₂ emissions, have only mixed predictive value. Our results also hold when using a spatial model of interdependence among countries to account for collective action.

The spatial model further shows that mitigation laws are disconnected from the actions of countries responsible for a large share of global emissions. While others have pointed out how people support unilateral mitigation

(Tingley & Tomz, 2014), our analysis systematically documents the absence of interdependence in national climate laws over time. Contrary to free-riding, policymakers do not appear to account for mitigation laws passed in the highest-emitting nations.

While it is difficult to directly test our mechanisms, we evaluate them indirectly from various angles. We first examine non-climate disasters, which would not change leader beliefs about global warming's timing. These placebo disasters do not lead to more climate laws. We also explore how countries with varying levels of democracy respond to disasters since leaders in democratic countries are more likely to anticipate public accountability. Indeed, there is only policy responsiveness to disasters in countries with medium and high levels of democracy.

We take several steps to assess the validity of the economic assessment model and the robustness of the results. First, we benchmark the model against its peers. Second, we code the climate vulnerability moderator to account for uncertainty by capturing where a country falls on the distribution of damages rather than less precise point estimates. Third, we conduct robustness exercises that perturb the threshold categorizing countries as facing damages. Lastly, we use a separate difference-in-differences research design and find similar results.

Our article integrates research in economics and political science to explain policymaking responses to climate change. Our model of policy preferences based on how global warming affects locations provides stronger foundations for distributive politics theories. Geography should be the starting point for theorizing how vulnerability shapes climate politics.

As people feel climate change's effects, global warming's heightened proximity is activating a new political cleavage. This finding reframes the climate problem. The *geographic* North-South divide structures political responses to global warming, which explains why countries, even low-income ones, pass mitigation policies, despite incentives to free-ride. Our view of climate change as a cleavage, rather than a common threat, suggests that the world cannot solve the problem without global and domestic bargains between countries in the geographic North and South.

What Explains Climate Mitigation Policy?

A prominent view is that climate change is a collective action problem (Barrett, 2003; Keohane & Victor, 2016; Ostrom, 2009). Emissions reductions require costly actions from all polluters, while everyone benefits regardless of whether they helped. Since the cost-benefit calculations of policymakers fail to completely capture the benefits of their actions for the world, the overall effort to mitigate climate change will be less than ideal from the global viewpoint.

What collective action implies for mitigation policy is not apparent absent a model of domestic politics. Scholars and policymakers often focus on the free riding prediction (Aklin & Mildenerberger, 2020), but this suggests that mitigation is suboptimal, not the absence of policy, which could emerge because countries differ in their mitigation costs, private benefits, and ability to affect emissions (Kennard & Schnakenberg, 2023).

Scholars have turned to look within countries at societal groups' preferences and the institutions that aggregate them into policy (Harrison & Sundstrom, 2007). One set of explanations emphasizes institutions such as electoral rules (Finnegan, 2022, 2023; Harrison & Sundstrom, 2010), veto points (Madden, 2014), and corporatism (Meckling et al., 2022; Mildenerberger, 2020). But these exhibit little change over time so they alone cannot explain the growth of climate laws. Other institutions, such as regime type (Bättig & Bernauer, 2009), welfare programs (Kono, 2020), and bureaucratic capacity (Meckling & Nahm, 2022), display slightly more temporal variation, but do not explain policy demand.

Public concern is one source of demand for mitigation. People's willingness to pay for reducing emissions varies and affects policymaking (Schaffer et al., 2022). Support for climate policy falls when citizens confront taxes or higher energy prices, while people discount the future benefits of avoided warming (Bechtel et al., 2020; Bechtel & Scheve, 2013; Egan & Mullin, 2017; Gazmararian, 2024b). Voters harmed by climate policy, such as those working in fossil fuel industries, may turn to parties that oppose mitigation (Colantone et al., 2024; Gazmararian, 2024a; Gazmararian & Krashinsky, 2023; Stokes, 2016). Mitigation's "co-benefits," such as green jobs or reduced pollution, could also foster public support (Gazmararian & Tingley, 2023; Stokes & Warshaw, 2017). Co-benefits, however, are insufficient to explain the growth of climate laws because they could be created in most countries.

The strength of business opposition and support is another explanation for mitigation policy adoption. Mildenerberger (2020) argues that fossil fuel interest groups have captured the policymaking process, implying that climate laws vary according to the ties between parties and carbon-intensive businesses. Reforms could emerge after energy shocks (Aklin & Urpelainen, 2013), or when interest groups fail to foresee a policy's consequences (Stokes, 2020). Businesses that benefit from climate policy could also lobby for it (Hughes & Urpelainen, 2015; Kennard, 2020; Meckling, 2011), but studies disagree about the influence of green interest groups (Cheon & Urpelainen, 2013; Schaffer & Bernauer, 2014; Ward & Cao, 2012). These conflicting results are unsurprising since few analyses consider climate vulnerability and most countries have persistent fossil fuel interest groups, which cannot explain increased climate laws.

Environmental organizations and green parties may also influence climate laws (Binder & Neumayer, 2005; Böhler et al., 2022; Harrison & Sundstrom, 2010; Kelemen & Vogel, 2010; Knill et al., 2010; Schulze, 2021). But findings are mixed (Fankhauser et al., 2015; Jensen & Spoon, 2011; Ward & Cao, 2012). Green parties also concentrate in Western Europe, which cannot explain the emergence of mitigation policies in developing countries. Our theory below further suggests that support for mitigation by political parties and civil society is a product of vulnerability and disasters that increase global warming's salience.

Diffusion is another hypothesis for mitigation policy adoption (Fankhauser et al., 2016; Kammerer & Namhata, 2018; Ward & Cao, 2012). But diffusion faces theoretical limits. It is unclear why joint-international organization membership, for example, would be enough for nations to enact costly policies over the objections of interest groups. It is also hard to disentangle the effects of neighbors being similarly climate vulnerable from learning and socialization.

Some studies consider climate vulnerability, which we argue is central to climate politics. Explanations of support for international environmental agreements and public preferences over compensation emphasize ecological vulnerability (Gaikwad et al., 2022; Sprinz & Vaahtoranta, 1994). Accounts of climate politics often mention vulnerability as a factor motivating mitigation, including for developing countries (Andonova & Sun, 2019; Genovese, 2020; Keohane & Victor, 2016). Still, scholars often treat vulnerability simply as a control (Bailer & Weiler, 2015; Dolšák, 2001, 2009; Rowan, 2021; Tørstad et al., 2020), and the evidence for the link between vulnerability and policy adoption is inconclusive (Steinebach et al., 2021; Tubi et al., 2012).

These mixed results are likely due to shortcomings in measurement and theory. First, previous studies rely on indices approximating vulnerability. None use estimates from economic models that account for adaptation to climate change, which is necessary to capture global warming's redistributive effects across space.

Second, vulnerability is largely time-invariant in the medium term, so it cannot explain the recent growth of mitigation laws.¹ An exception is Colgan et al. (2021), who theorize that climate politics will evolve as global warming and mitigation policies alter the value of political actors' assets.

Our theory departs from Colgan et al. (2021) in two ways. First, we derive our hypotheses from spatial economic models of global warming that indicate there is greater geographic heterogeneity in its effects. Climate change's economic effects vary considerably within and across countries (Burke et al., 2018; Callahan & Mankin, 2022; Dell et al., 2012; Desmet & Rossi-Hansberg, 2015; Kotz et al., 2021). Higher temperatures in places that are currently cool enhance productivity up to a limit (Burke et al., 2015; Conte et al., 2021), decrease mortality (Carleton et al., 2022; Hsiang et al., 2017), and reduce

energy consumption (Hsiang et al., 2017; Rode et al., 2021). Whereas higher temperatures in currently warm areas degrade productivity, increase mortality, and raise energy consumption. Warming will redistribute economic activity away from places facing damages to areas less vulnerable as people and firms adapt through trade, migration, and investment (Cruz & Rossi-Hansberg, 2024).

Parts of the Northern hemisphere may experience GDP gains, whereas the South suffers severe damages (Cruz & Rossi-Hansberg, 2024). This *geographic* North-South divide differs from the historical cleavage between developing and industrialized countries, the focus of climate politics (Paterson & Grubb, 1992; Roberts & Parks, 2007). Scholars have already begun to question the utility of the Global North-South divide because of diverging interests within each bloc (Hurrell & Sengupta, 2012). We point out that global warming's material effects cut across both industrialized and developing countries.

Second, geography yields different predictions than the asset revaluation framework. For example, farmers—despite having similar assets—likely do not have uniform climate policy preferences because global warming's effects vary by location. Some agricultural regions could benefit while others lose (Hsiang et al., 2017). Our geographic approach accounts for this heterogeneity, whereas an asset-centered approach—without stretching the concept of assets—does not. There is also limited data on asset vulnerability, but there are validated models of global warming's economic effects across space, which allows us to test our theory.

Theory of Climate Cleavages

Our theory aims to explain when countries adopt mitigation policies. The argument centers on the incentives and expectations of politicians. Leaders care most about political survival. Mitigation policy imposes immediate costs on people, businesses, and elites, such as higher energy prices and lost profits from phasing out fossil fuel industries. These costs can threaten a leader's political fortunes if those harmed are part of the coalition keeping her in office.

Global warming's physical impacts will also be costly. For vulnerable locations, avoided future climate damage represent one of mitigation's primary benefits. But there is uncertainty about when people will feel climate change's impacts, so politicians have little incentive to adopt mitigation policy until its benefits outweigh the short-term costs of moving away from fossil fuels.

Politicians and the public are initially uncertain about global warming's timing (Weber, 2006). Politicians have access to experts, so they may have greater knowledge than ordinary people, but leaders also know that the public sees global warming as an uncertain, long-term problem.² Therefore,

politicians have few incentives to act on private information about when they will feel global warming's effects because they anticipate that the public, businesses, and societal groups will discount mitigation's benefits and backlash to its costs.

We argue that when people feel climate change's effects, it will cause leaders and citizens to view global warming as more proximate. Politicians in vulnerable countries anticipate that people will hold leaders accountable if they fail to prevent bad climate outcomes. Shocks create opportunities for voters to learn about the incumbent (Ashworth et al., 2018). Even if citizens do not attribute disasters to climate change, they may still blame the government for poor economic performance (Balcazar & Kennard, 2023). Some politicians may act in anticipation of the public's response (Arnold, 1990; Key, 1961), while those who fail to do so face public opposition, a lesson for other leaders (Fiorina, 1981).

Fox and Van Weelden (2015) develop a formal model that supports these claims. They show when leaders know a disaster is more likely, there are greater political incentives to avert it. But when citizens are unsure of when the next disaster will strike, leaders have incentives to provide relief afterward rather than take preventive actions (Bechtel & Hainmueller, 2011; Gailmard & Patty, 2019; Healy & Malhotra, 2009). As climate-related disasters become more frequent, leaders in damage zones expect that the likelihood of being held accountable for inaction will grow, motivating mitigation policy.

Several studies support this link between witnessing climate shocks and increased concern among politicians and people. Psychologically, people can better recall information from experience because of its vividness (Marx et al., 2007; Weber, 2006). Politically, disasters provide windows of opportunity for reforms by changing the public's understanding of issues (Birkmann et al., 2010). Lawmakers have responded to past disasters by supporting environmental policy (Elliott et al., 2023; Gagliarducci et al., 2019; Herrnstadt & Muehlegger, 2014). International bureaucrats emphasize climate risks in reports after missions to climate-impacted countries (Clark & Zucker, 2023). When disasters have high death tolls, protests can follow and leaders lose office (Quiroz Flores & Smith, 2013).

For ordinary people, seeing climate shocks can affect their belief in global warming. This attitudinal shift often fades quickly after abnormal heat, but it may persist after more destructive disasters (Egan & Mullin, 2017; Howe et al., 2019). Indeed, people exposed to hurricanes, floods, and fires become more supportive of mitigation (Albright & Crow, 2019; Arias & Blair, 2024; Hazlett & Mildenberger, 2020).³ Experience with climate shocks also influences when people search for climate information (Kennard, 2021), vote for green parties (Baccini & Leemann, 2021; Garside & Zhai, 2022; Hoffmann et al., 2022), donate to pro-climate candidates (Liao & Ruiz Junco, 2022), and reduce energy use (Spence et al., 2011).⁴

Surveys also suggest that people recognize when they live in climate vulnerable places. People in developing countries express greater concern about climate change, willingness to pay for mitigation, and eagerness to cooperate internationally than residents of developed nations (Bush & Clayton, 2023; Kim & Wolinsky-Nahmias, 2014). These findings suggest that after disasters, politicians in vulnerable countries will anticipate political costs if they fail to mitigate.

Short-run factors such as partisanship could block climate-related experiences from affecting beliefs (Boudet et al., 2020; Hazlett & Mildenberger, 2020). Politicians can cast doubt on the connection between disasters and global warming (Hai & Perlman, 2022). These forces of denial might be more prevalent in polarized countries like the United States but less so elsewhere. Some leaders, therefore, might not initially fear accountability. But limited responsiveness, where it exists, will likely fade as climate change's effects become clear and costly.

Politicians' different expectations about future climate damages imply that policy responses to disasters diverge across the geographic North and South. Northern politicians do not anticipate future crises because they know they are less vulnerable. Disasters could even polarize some Northern countries between the median voter, who faces net benefits, and harmed communities, which would make it more difficult to pass mitigation laws. In contrast, Southern politicians know that disasters will reoccur and that their constituents may blame them if they fail to stop climate change.

Politicians in non-democratic and hybrid regimes have similar, but not identical, incentives as those in democracies. Elections make presidents and prime ministers more responsive to demands for public goods (Bättig & Bernauer, 2009). Autocrats still rely on a coalition to stay in power (Bueno de Mesquita et al., 2005). If this coalition is climate vulnerable or leaders fear public unrest from citizens harmed by global warming, autocrats could face pressures to mitigate.

Rather than mitigation to stop climate change, politicians could respond with adaptation to make it easier to live with global warming. But there are limits to adaptation, so it cannot substitute for mitigation (Adger et al., 2009). Further, people worldwide are demanding mitigation at home, so there are political incentives to reduce emissions (Dechezleprêtre et al., 2022). Leaders recognize the public's preferences, reflected in the 77% of developing countries' Paris commitments that set mitigation targets (Sforna, 2019). Lastly, developing countries account for a large share of future emissions, so their mitigation could affect how much global warming harms them (Chen & Zeckhauser, 2018; Fuhr, 2021).⁵

Consistent with our theory, as people and politicians recognize climate change as a threat today, constituencies for mitigation are emerging in low-income countries. Elites in India increasingly realize the country's

vulnerability, which has led more internationalist policymakers to support mitigation at home (Michaelowa & Michaelowa, 2012; Vihma, 2011). In Vietnam, lawmakers cite the country's vulnerability as one of the primary reasons for mitigating climate change (Zimmer et al., 2015).

Though economic models indicate that higher temperatures may have net benefits, our argument does not require that politicians consider these gains. Rather, our claim is that leaders in locations facing potential benefits lack political incentives to mitigate. This could be because they are uncertain about damages. Still, Northern politicians have begun to mention climate benefits. For example, Joe Oliver (2019), Canada's former finance minister, called for the country to embrace the agricultural potential and tourism from warmer weather.

How leaders respond to climate change could influence global politics. We predict that because of the geographic asymmetry in climate damages, the geographic North and South will have conflicting preferences over emissions reduction. The North faces potential net gains and has little incentive to respond to climate change with mitigation policy. The South will suffer intense damages and is more likely to curtail emissions in response to global warming. Though some citizens in the North appear supportive of climate action, support diminishes as costs rise (Bechtel & Scheve, 2013). Since the emissions by the North harm the South, a new political cleavage may be forming. Countries in the South have begun to demand compensation for disasters caused by the North's pollution (Shao, 2022).

There will remain divisions within the geographic North and South. Countries have other issues that divide them more than climate unifies them. There are also conditions where the cleavage might not form. If the world reaches unknown climate tipping points, countries could find themselves bargaining in the shadow of an existential catastrophe and seek an 11th-hour solution (Maggi & Staiger, 2022). But the lethargic mitigation by governments suggests this existential risk is not guiding decision-making.

Data and Measurement

Climate Mitigation Laws

We test whether a climate cleavage is forming between countries by exploring the laws they have passed to mitigate emissions.⁶ Mitigation policy is necessary to avoid climate change's worst impacts. The analysis focuses on policies, rather than emissions, because external factors such as population, economic growth, and innovation influence pollution (Harrison & Sundstrom, 2010).

We focus on mitigation because, as discussed above, politicians have incentives to mitigate even when adaptation is available. Adaptation policies

are also multi-use. Infrastructure development, for example, could have the side effect of making roads more resilient to warming. Measuring adaptation confronts formidable obstacles.

Data come from the Climate Change Laws of the World, a widely-used resource because it covers decades of policymaking in almost all countries (Nachmany et al., 2017).⁷ Mitigation policies are laws or regulations that control greenhouse gas emissions with caps or taxes, provide incentives for efficiency and clean energy, or manage carbon-negative natural resources. A law must have full legal force and be demonstrably motivated by climate change. Our analysis examines 155 countries in the post-1990 period when mitigation efforts began (Eskander et al., 2021).⁸

Researchers confront several challenges when comparing countries' policies: climate laws do not follow a standard template but use different tools to solve the same problem; governments with low transparency or limited media coverage may pass laws that go undetected by data collectors; and leaders do not always implement the laws on the books (Lieberman & Ross, 2024). We consider these limitations in our measurement strategy and analysis.

First, we follow the literature on policy adoption by analyzing the count of national climate laws (Eskander et al., 2021; Eskander & Fankhauser, 2020; Townshend et al., 2013). The stock captures the overall effort of countries. One analysis separates the laws by the following types to improve their comparability: taxes, subsidies, regulations, and economy-wide initiatives.⁹

Second, low transparency and lack of press coverage could lead to underreporting of laws, but because these factors are more prevalent in developing countries, they would bias against our hypothesis. Low-income countries in the South would appear less likely to mitigate.

Lastly, some policies lack credibility, but Eskander and Fankhauser (2020) find that the average climate law reduces emissions. The average law reduced annual carbon emissions intensity by 0.78% in the short-term and 1.79% in the long run—a savings of one year of global CO₂ output. We conducted a similar analysis and found consistent results (Appendix B.3.2).

We also extended their study by assessing whether the effect of climate laws on emissions varies across the North and South because a potential concern is that enforcement is weaker in the South. But we found the opposite. Mitigation laws were more likely to improve emissions intensity when enacted by countries in the geographic South. The relationship between policy and emissions is complex and requires detailed case studies to ascertain the precise mechanism. Still, these results suggest that mitigation policies, as measured, reduce emissions on average—even in the South.

Future Climate Damages

Vulnerability is a combination of a country's exposure to climate disturbances and its capacity to respond (IPCC, 2023). We use the Cruz-Rossi-Hansberg (CR) spatial integrated assessment model to estimate how climate change will affect income in over 17,000 locations worldwide, each location consists of a $1^\circ \times 1^\circ$ grid. CR build on the spatial growth framework to capture how the world economy evolves.¹⁰ They incorporate damage functions that account for how long-run local temperature changes affect fundamental productivities and amenities. Unlike previous work, the model allows for adaptation through trade, migration, and innovation. The model assumes a business-as-usual emissions trajectory and estimates the damage functions prior to serious mitigation efforts, so mitigation policy does not affect the estimates. If a location faces income loss, that location is vulnerable.

We aggregate CR's estimates to the country level, weighting estimates by a grid's population (Figure 1). This quantity represents climate change's effect on local income for the average citizen. The moderator takes the value one if a country faces net-damages in 2050, and zero otherwise. This year is far enough in the future that climate change has appreciable economic effects. The moderator is dichotomous because estimates of global warming's effects are uncertain, which decreases the informativeness of point estimates. Rather than create the impression of certainty, a binary measure is more realistic by recording whether a country is on the damages or benefits side of the distribution. In robustness tests, we perturb this threshold to assess the behavior of borderline countries.

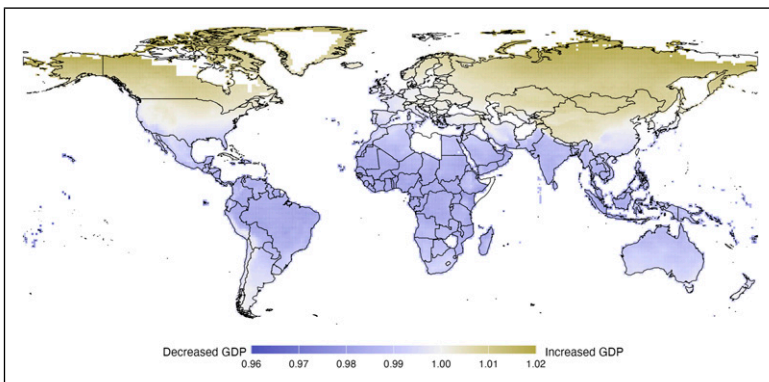


Figure 1. Effect of global warming on GDP in 2050. The map depicts the ratio of 2050 GDP in a world of global warming damages to a counterfactual in which temperature has no effect. Values less than 1 denote decreased GDP because of global warming. Source: Cruz and Rossi-Hansberg (2024).

Climate Shocks

A climate shock refers to an extreme weather event that people witness and could associate with global warming. We measure shocks with climate-related disasters, that we theorize shift politicians' incentives to adopt mitigation laws. Climate change may have made these disasters more likely, but what matters is that leaders believe the public could interpret a disaster as the consequence of global warming. The visibility of disasters increases the likelihood that citizens and politicians see them or learn through the media.

Data come from the Epidemiology of Disasters' Emergency Events Database (EM-DAT). The measure includes disasters that EM-DAT categorizes as "climatological" or "meteorological." Climatological refers to hazards caused by atmospheric processes due to intra-seasonal or multi-decadal climate variability, such as droughts and fires. Meteorological refers to hazards caused by short-lived extreme weather and atmospheric conditions, such as extreme temperatures and storms. We exclude disasters that lack documentation to classify them as climate-related ([Appendix B.4.1](#)). We lag the count of disaster by one year.

Disasters are likely underreported in the Global South. This would introduce bias against our hypothesis because there would be political pressure to pass mitigation laws that the measure did not capture. Controls in the empirical model for GDP and regime type may reduce this bias by accounting for resources and institutions that predict disaster reporting.

Research Design

The challenge for causal inference is that where disasters occur and a country's vulnerability may correlate with factors such as wealth that would confound the analysis if they also predict mitigation. While all disasters contain a random element outside of policymakers' control—people cannot stop hurricanes—wealthier countries may have more resources to reduce the destruction inflicted, and democracies may have made more investments in preparedness because of voter preferences ([Bechtel & Mannino, 2022](#)). The failure to account for variables that predict disasters, climate vulnerability, and mitigation policy would confound our inferences.

We approach this challenge by conditioning on covariates that predict a country's exposure to disasters. Our empirical models include a measure of GDP per capita (logged) to account for how some nations may have more resources to prepare for and respond to disasters. The polyarchy index from V-Dem captures the electoral incentives leaders have to prepare for disasters.¹¹ The models also include year fixed effects that remove bias from global factors that increase disaster risk, such as changes between the El Niño and La Niña weather patterns. Country fixed effects further hold constant time-invariant

differences that make a country more likely to suffer disasters such as coastline.

Since our theory predicts that vulnerable countries will differ in their response to disasters, we consider climate vulnerability's exogeneity. Whether a country faces damages or benefits depends on geographic factors such as latitude and coastline.¹² Our climate damage measure, however, includes endogenous decisions to invest, migrate, and trade. Therefore, we control for GDP per capita, regime type, and trade openness to isolate the geographic component of climate vulnerability.

We conduct sensitivity analyses to assess the plausibility of our strategy to address confounding (Cinelli & Hazlett, 2020). These tests assess how large an omitted variable correlated with disasters, climate vulnerability, and mitigation laws would have to be to change our conclusions. An extreme confounder with twice the correlation of oil production, the interaction of damages and disasters, and mitigation laws would not alter our findings (Appendix C.2).

Controls for Distributive Politics Explanations

It is unlikely that disasters only occur where domestic political conditions are already leading to climate laws. Still, we include controls to account for distributive politics. Explanations emphasizing fossil fuel interest groups would predict that as their economic influence changes, the probability of climate policy shifts. We focus on fossil fuel production because mitigation policies threaten these industries. Data on oil and gas production come from the BP Statistical Review of World Energy.¹³ We scale these measures for interpretation with the country-level standard deviation, so a one-unit shift represents a standard deviation increase in a country's annual production relative to other years.¹⁴

We also account for production-based CO₂ emissions, which capture carbon-intensive industrial activity within a nation's borders. To standardize this comparison, we calculate the logarithm of CO₂ emissions per capita, the emissions associated with the average citizen. We examine emissions tied to production rather than consumption because the former has better coverage, requires fewer assumptions, and captures emissions embodied in exports.

Exposure to international trade also affects climate policy's costs for firms and consumers, which alters their incentives to support mitigation laws (Genovese, 2019; Kennard, 2020). We control for trade with the KOF measure of de facto trade openness (Gygli et al., 2019).

Distributive politics theories anticipate that countries that benefit economically from climate policies would mitigate. Such green economy winners include locations with rare earth minerals used in batteries. Our empirical model estimates the within-country change in climate policy, which

statistically removes time-invariant features like a country's mineral reserves or suitability for renewable energy, which are largely static.

Post-treatment bias is a concern because effective climate policy will curtail fossil fuel production and reduce emissions. We estimate models with and without controls for fossil fuel production and CO₂ emissions to ensure that these controls do not affect the results. Post-treatment bias is unlikely in the time period under study because there is a lag between policy adoption, implementation, and emissions.

We also control for the ideology of politicians because right-wing governments might be less likely to mitigate (Schulze, 2021). We use data from Herre (2023) to construct an indicator for whether a country's head of state has a rightist ideology, defined as leaders who want the state to rarely intervene.

Estimation Strategy

We use linear regression to estimate the effect of disasters on mitigation policy adoption, depending on whether a country faces future climate damage:

$$Y_{it} = \beta_0 + D_{it-1}\beta_1 + D_{it-1}X_i\beta_2 + \mathbf{Z}_{it}^\top \beta_3 + \alpha_i + \eta_t + \epsilon_{it}. \quad (1)$$

The outcome, Y_{it} , is the national stock of climate mitigation laws in a year. Our interest is β_2 , the coefficient for the interaction of climate-related disasters, D_{it-1} , and the future climate damage moderator, X_i . There is no constituent term for X_i because it is collinear with the country fixed effects, so it drops out in estimation. We test the linearity assumption behind this moderating effect by exploring the raw data at the two moderator values (Figure C1). The assumption appears plausible because the moderator emulates a binning estimator (Hainmueller et al., 2019).

$\mathbf{Z}_{it}$ contains time-varying covariates described above. Year fixed effects, η_t , account for common contemporaneous factors like technological innovation, energy crises, or diffusion from international climate conferences. While α_i are country fixed effects to remedy potential confounding from constant differences between countries like cultural influences on discount rates, experience with disasters, and veto points.

Results

Effect of Disasters on Mitigation Laws Varies with Vulnerability

Table 1 presents the estimated effect of a climate-related disaster in the previous year on the subsequent change in a country's mitigation laws. Model 1 shows that disasters increase climate laws on average. Our theory predicts that this positive response is more likely in countries facing future damages,

Table 1. Effect of Climate-Related Disasters on Mitigation Laws in the Geographic South (Future Damages) and North (Potential Benefits), 1990–2020.

	Climate-Related Disaster				Placebo Disaster	
	(1)	(2)	(3)	(4)	(5)	(6)
Disaster	0.22*** (0.08)	–0.06 (0.10)	–0.08 (0.10)	–0.10 (0.12)		
Future damages × disaster		0.30** (0.13)	0.30** (0.13)	0.32** (0.15)		
Earthquake					–0.09 (0.28)	
Future damages × earthquake					0.13 (0.30)	
Pandemic						–0.44** (0.22)
Future damages × pandemic						0.05 (0.31)
GDP per capita (log)			0.00 (0.33)	0.19 (0.35)	0.18 (0.36)	0.17 (0.35)
Polyarchy			–2.94** (1.26)	–2.90** (1.19)	–2.95** (1.21)	–2.89** (1.22)
Right ideology leader			0.27 (0.19)	0.24 (0.20)	0.25 (0.20)	0.24 (0.20)
Trade openness			0.03*** (0.01)	0.03*** (0.01)	0.03*** (0.01)	0.03*** (0.01)
Coal production				0.05 (0.44)	0.06 (0.44)	0.05 (0.44)
Oil production				–0.19 (0.34)	–0.17 (0.34)	–0.16 (0.34)
CO ₂ per capita (log)				–0.45 (0.46)	–0.43 (0.46)	–0.43 (0.46)
N	5097	5097	4753	4752	4752	4752
Adjusted R ²	0.20	0.20	0.21	0.21	0.21	0.21
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes

Note. Estimates from a linear regression of climate mitigation laws on the interaction of the lagged climate-related disaster count and an indicator for whether a country faces future climate damage. Heteroskedasticity robust standard errors clustered by country are in parentheses. The table omits the constituent term for future damages because of its collinearity with the country fixed effects. Coal and oil production covariates are standardized with the country-level variation.

*** $p < .01$; ** $p < .05$; * $p < .10$.

which is what Model 2 reveals. Models 3 and 4 add time-varying controls, including coal production, oil production, and carbon dioxide emissions, and the results persist when accounting for these distributive politics explanations.¹⁵

Countries pass 0.22 more mitigation laws on average after one disaster if they face future climate damage. There is no detectable increase in climate laws after disasters in countries that face possible net benefits. The average within-country standard deviation in climate laws is 2.4, so the effect of one additional disaster amounts to about 9% of this variation in the outcome. This shift occurs despite the infrequency of policy adoption.

These conditional responses to disasters occur across the *geographic* North and South but not the *historical* North-South. There is no difference in how Global North and South countries, defined by level of development, respond to climate-related disasters. This supports our argument that the geography of vulnerability is driving policy responses to global warming (Table D4).

Figure 2 disaggregates climate laws to examine the effect of disasters on the adoption of specific policy instruments. The results hold across types of climate laws such as taxes, subsidies, and economy-wide restrictions. Some governments in vulnerable countries respond to disasters with laws imposing taxes and regulations on citizens and businesses.

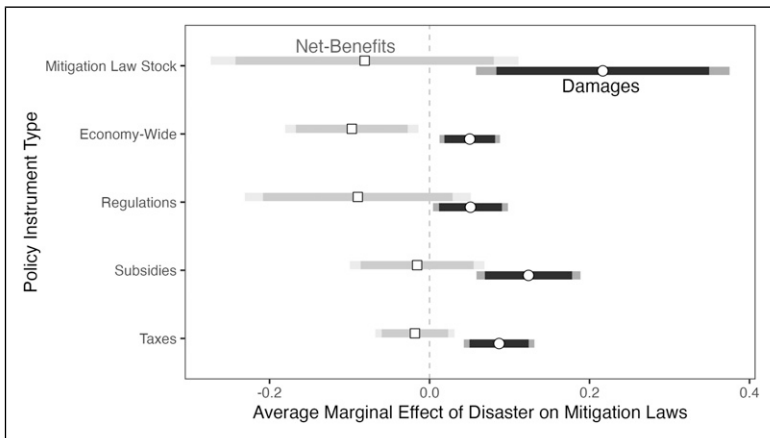


Figure 2. Effect of climate-related disasters on mitigation law adoption by instrument type, 1990–2020. Average marginal effect estimates come from a linear regression of mitigation laws on the future climate damage indicator (geographic South) interacted with the lagged disaster count; controls for GDP per capita, polyarchy, leader ideology, and trade openness; and year and country fixed effects. The plot depicts the effect of a one-unit increase in climate-related disasters. Bars denote 95 and 90% confidence intervals with heteroskedasticity-robust standard errors clustered by country. Table D1 contains regression estimates. $N = 4,753$ (155 countries $\times$ 31 years).

The gap in responsiveness across the geographic North and South suggests that there is an emerging political cleavage. All countries are falling short of stopping climate change (IPCC, 2022). But it is only in the South that policymaking responds to visible signs of global warming. If countries in the South continue to respond to disasters while those in the North do not, the South's mitigation laws may eventually exceed the North's.

This does not mean that leaders and people in the North do not care about climate change. Some do. The estimates reflect within-country changes in climate laws, so it is possible that the North has more laws overall. Indeed, if we average the annual count of mitigation laws in Northern countries and compare it to the Southern average, a typical country in the North has one more law than a country in the South. This difference, however, disappears once controlling for GDP per capita, which suggests that the gap is due to the North's wealth (Table B3). This exercise also highlights the inferential limits of comparing countries to each other, motivating our analysis that compares countries to themselves over time.

Countries in the South are enacting mitigation laws despite having less capacity to do so than those in the North. Assessments of Paris Agreement commitments conclude that Northern countries are not contributing enough relative to their wealth and historical responsibility, unlike Southern nations (Robiou du Pont & Meinshausen, 2018). When countries in the North have passed mitigation policies recently, their publics have protested, with farmers taking the streets in the Netherlands and France.

Mechanism Tests

Placebo Tests of Belief Updating. We conduct two placebo tests to evaluate the mechanism that changing beliefs about global warming's timing explain why countries in the geographic South pass mitigation laws. We cannot assess this claim directly because there are no panel data on leader expectations about global warming. Still, our argument implies that politicians should only pass mitigation laws after climate-related disasters because they provide information about when countries will feel global warming's effects. If leaders enacted laws in response to any disaster, that would be inconsistent with changing beliefs about climate change's timing.

The first placebo test looks at earthquakes. Climate change does not worsen earthquakes, so they would not affect climate lawmaking. The second placebo is the number of viral disease outbreaks. Pandemics may reduce resources to implement climate policy but they would not increase climate risk salience differentially across countries facing future damage and possible net benefits.¹⁶

Table 1 shows that these placebos do not increase climate laws. Viral disease outbreaks make mitigation policy less likely, possibly due to resource

constraints, but there are no differences across the North and South. These results are consistent with our mechanism that climate-related disasters provide information to leaders about global warming's timing, and these updated expectations motivate mitigation policy adoption.

Regime Type and Responsiveness to Public Preferences. The reason leaders respond to disasters with policy is that they anticipate being held accountable by the public and societal groups if they fail to mitigate. We expect that democracy, therefore, magnifies responsiveness by making accountability more likely (Bueno de Mesquita et al., 2005). To test this hypothesis, we estimate a triple interaction between disasters, climate vulnerability, and polyarchy. We bin the polyarchy moderator at the 25th, 50th, and 75th percentiles to ensure there is common support in the data. Since our focus is the level of democracy, we calculate a country's average polyarchy score.¹⁷

Figure 3 presents the average effect of a disaster on mitigation laws in countries facing damages and net benefits at three levels of polyarchy. More democratic, climate vulnerable countries pass laws after disasters. This effect is not constrained to the most democratic nations. Vulnerable countries with more moderate levels of democracy also pass mitigation laws after climate

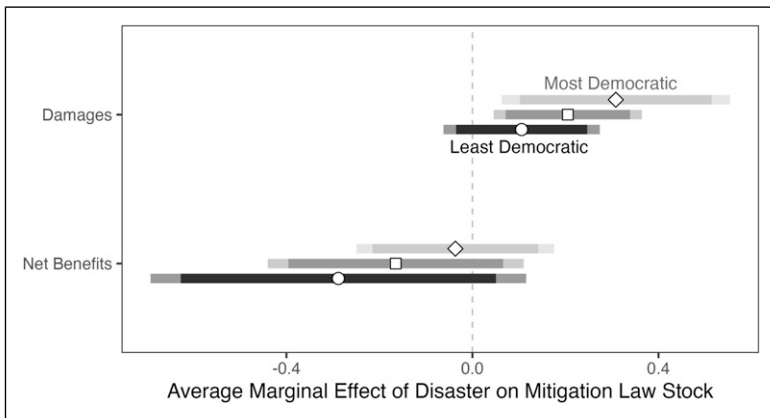


Figure 3. Effect of climate-related disasters on mitigation laws moderated by polyarchy, 1990–2020. Average marginal effect estimates come from a linear regression of mitigation laws on the interaction of future climate damages (geographic South), the lagged climate-related disaster count, and a country's average level of polyarchy; controls for GDP per capita, leader ideology, trade openness, coal production, oil production, and CO₂ per capita; and country and year fixed effects. Bars denote 95 and 90% confidence intervals with heteroskedasticity robust standard errors clustered by country. Table D3 contains regression results. $N = 4,590$ (155 countries $\times$ 31 years).

shocks. The finding concurs with our argument that disasters cause leaders to update their expectations of being held accountable for not mitigating.

Uncertainty About Future Damage Creates Status Quo Bias. Our theory implies that countries on the borderline of damages and benefits, such as those with interior regions that lose and gain from climate change, are less likely to pass mitigation laws. Their politicians and publics are uncertain about future damages, which creates a bias toward the status quo. The perceived benefits of mitigation do not outweigh the short-term costs.

To test this hypothesis, we perturb the threshold dichotomizing countries into those facing damages and net benefits. We expect that countries near the cutoff behave like those anticipating net benefits. [Figure D1](#) plots the average effect of a disaster on mitigation laws at different damage thresholds. The results generally hold and sometimes strengthen when including these borderline cases as part of the geographic North. Twenty borderline countries that face less than half a percentage point in damage to GDP in 2050, a group including the US, China, and Germany, behave *as if* they anticipate benefits or are indifferent. These results emphasize the role of uncertainty, which renders borderline cases *de facto* members of the North. It also indicates that the results are robust to different damage thresholds.

Distributive Politics

Disasters lead to more mitigation laws in climate vulnerable countries. This effect obtains with and without controls for standard distributive explanations, such as fossil fuel production and CO₂ emissions per capita. These controls address the concern that climate vulnerability is spurious with fossil fuel production.¹⁸ Changes in coal production, oil production, and carbon emissions, though not causally identified, have no correlation with policy-making. Future research should unpack why. More work needs to measure distributive politics explanations. The strength of fossil fuel interest groups also does not shift much, so it cannot explain the growth of mitigation laws.¹⁹

Collective Action

The common view is that Northern countries, especially European ones, are climate leaders, and developing countries are free riders (e.g., [Victor, 2011](#)). But we find that countries in the geographic South are more likely to adopt mitigation policies after disasters. All may still free ride because countries remain deficient in their climate commitments.

Our results show that—within the collective action framework—when leaders perceive greater benefits from mitigation because of their geographic vulnerability, they become more likely to pass mitigation policies. This is

consistent with global public goods models where what matters is beliefs about costs versus benefits (Kennard & Schnakenberg, 2023).

We also estimate a spatial model of collective action dynamics. This model measures spatial interdependence among nations with a parameter for how much the policies of high emitters influence a country's laws. If countries responsible for a large share of emissions pass mitigation laws, collective action theories would predict that, all else equal, this encourages free riding by others.

We find no evidence of interdependence between a country's climate policy at home and the change in climate laws in high-emitting nations.²⁰ This does not imply the irrelevance of collective action, but it does suggest that countries are not calibrating their policies in real time to the laws of major emitters. In these models, the conditional effect of disasters on laws continues to hold.

Alternative Explanations and Robustness

There are four alternative explanations that we address. First, since the model estimates the effect of climate-related disasters on within-country changes in climate laws, a concern is that countries started from different baselines. The data do not bear this out. In 1990, the average nation facing damages had 0.1 laws, while those facing net benefits had 0.4.

Second, systemic pressures from international organizations or climate finance commitments could have compelled leaders to adopt policies. But this would not explain responsiveness to disasters. Still, we employ a spatial model to account for systemic forces. No correlation appears between climate law passage at home and the adoption of similar laws by countries in the same international organizations (Appendix D.5). The conditional effect of disasters on climate laws also obtains when controlling for this spatial interdependence.

Third, the intensity of climate disasters might differ across the North and South, which could explain the gap in policymaking responses. While consistent with our theory, this could pose a problem for inference. We estimate a model that controls for disaster deaths, holding constant disaster intensity, and the results persist (Appendix C.4).

Fourth, one might worry that unique countries drive the results. Post-Soviet states could be responsible because many face potential net benefits and have distinct politics. The results, however, are consistent when excluding post-Soviet countries (Appendix C.4). We also checked whether the estimates are an artifact of including high-income countries as part of our geographic South, and find that they are robust to trimming countries like Australia or those in Southern Europe (Appendix C.3).

Lastly, we use a separate difference-in-differences research design for robustness. An advantage of this approach is that it shows how countries before disasters followed similar trends in mitigation policy. This rules out the

possibility that nations passed laws in anticipation of damage but not in response to disasters. The analysis uses the fixed effects counterfactual estimator, which also demonstrates robustness to treatment effect heterogeneity and staggered treatments with reversion (Liu et al., 2024).

Climate Change as a New Political Cleavage

Global warming is activating new political cleavages across and within countries as people increasingly feel its effects. To understand political responses to climate change, one must account for the unequal ways that global warming will materially affect places worldwide. Global warming will have a profound economic and social toll that falls disproportionately on the geographic South.

From a normative perspective, these damages warrant swift cuts to emissions. Countries' mitigation policies, however, are falling short of what is required to avoid climate change's worst impacts. Our findings provide little cause for optimism. Only leaders in the South are responding to visible signs of global warming in their countries by enacting mitigation laws, whereas there is much less responsiveness in the North.

We interpret this differential responsiveness to disasters as evidence of a growing cleavage between the geographic North and South. These divisions are already affecting negotiations at international conferences with demands for loss and damages by blocs like the Vulnerable Twenty. As predicted by our geographic North-South divide, this organization includes 68 climate-vulnerable nations but excludes China, which we categorize as part of the North.

Two scenarios may emerge as climate change accelerates. In the first, the geographic North and South fail to reach a settlement over the Earth's temperature. The South then must neutralize the North's unabated emissions. Southern countries may impose carbon tariffs, press their people to migrate north, or hold up cooperation on important issues to polluting nations. International institutions for the environment become much less effective than on other issues with clearer global externalities. If the South's efforts fail, they might turn to last-ditch efforts, such as geoengineering, to cool the planet.

In the other scenario, the geographic North and South reach an agreement over mitigation levels, where countries facing losses persuade, coerce, or compensate those that benefit into forgoing their potential gains. Countries in the South may have greater leverage in the future as they account for a growing share of the world's population and have increasing trade ties and economic growth. Their vulnerability could also legitimize their demands in international negotiations, persuading publics in Northern countries (Genovese, 2020). One outcome might be a bargain where the South accepts

Northern pollution in exchange for adaptation support via climate finance, which borderline countries might be more willing to provide.

These possible futures appear after accounting for the geographic asymmetry in global warming's damages and benefits. Our paper shows how collective action and distributive politics theories have incompletely specified political actors' preferences due to the lack of an economic model of climate change. Rather than the Global North-South divide, our geographic division explains why countries across income levels in the geographic South are more likely to respond to disasters with mitigation policy.

Our empirical approach brings together climate econometrics and political science, opening avenues for research. Extensions of our project could use the climate damage measures to make predictions about people, cities, and businesses, as we are attempting in parallel work (Gazmararian & Milner, 2023a). We find that only people in damage zones react to witnessing extreme weather by becoming more concerned and supporting mitigation, which substantiates our argument that leaders in the South should fear the political consequences of failing to mitigate (Gazmararian & Milner, 2023b).

Another line of research should examine climate cleavages within nations. Countries like the United States have regions that lose and gain from higher temperatures (Hsiang et al., 2017), which could polarize climate change and shape bargaining over the energy transition (Gaikwad et al., 2022). Global warming could also create cleavages between groups because of its disparate effects based on race, gender, and socioeconomic status (Benegal et al., 2022; Bush & Clayton, 2023; Zucker, 2024). Lastly, climate change could divide sectors and industries, which scholars could study by expanding our model beyond a one-sector economy.

Future research should also examine adaptation responses to disasters. Adaptation policies are multi-purpose, so they are challenging to measure. With appropriate data, the foundation of our theory should predict where demands for disaster relief and prevention emerge. But leaders who pursue only adaptation may face political liabilities if the public blames them for failing to mitigate bad climate outcomes, which adaptation alone cannot ameliorate (Adger et al., 2009).

All economic assessment models, even sophisticated ones that we use, face the inescapable difficulty of envisioning the world decades from now. This is an uncertain enterprise, which is why we implemented various empirical safeguards to account for this uncertainty. It is possible these economic predictions will change with more information. Our theory is not the final word, but should serve as a framework for analyzing climate politics. As economic models advance, scholars should update our predictions.

Our theory signals a new direction for climate politics research. Global warming's physical effects will increasingly constrain governments while reinforcing inequalities between the North and South. To understand climate

politics requires a deeper appreciation of how climate change will materially affect each part of the world. Our article offers new steps in this endeavor while pointing to a growing cleavage between the geographic North and South.

Acknowledgments

The authors appreciate feedback from Sabrina Arias, Lotem Bassan-Negate, Chris Callahan, Nives Dolšak, Jeffry Frieden, Zuhad Hai, Thomas Hale, Amanda Kennard, Robert Keohane, Devin Judge-Lord, Michael Oppenheimer, Aseem Prakash, Leigh Raymond, Dani Reiter, Dustin Tingley, Erik Voeten, and Noah Zucker, along with audiences at the 2021 International Political Economy Society annual meeting, the 2021 Environmental Politics and Governance online seminar, the 2021 Climate Pipeline Project's Brown University Climate Solutions Lab Convening, Washington University, and Emory University. Thanks to José-Luis Cruz and Esteban Rossi-Hansberg for sharing their data and code, and to Sofie Grouws, Yana Imyksenova, Bibiane Kan, and Marie Li for research assistance.

Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The author(s) received no financial support for the research, authorship, and/or publication of this article.

ORCID iDs

Alexander F. Gazmararian  <https://orcid.org/0000-0003-4179-3396>

Helen V. Milner  <https://orcid.org/0000-0003-2990-8373>

Data Availability Statement

Data and code to replicate this paper's results are available on the Harvard Dataverse.

Supplemental Material

Supplemental material for this article is available online.

Notes

1. Factors that affect vulnerability, such as wealth, might change, but exposure to climate change due to geographic factors such as coastline is invariant.
2. Voters also lack information about prevention policies (Bechtel & Mannino, 2023).

3. Kvaløy et al. (2012) find disasters are unrelated to global warming concern, but they do not consider climate vulnerability.
4. Hilbig and Riaz (2024) find that floods have national not local effects on Green Party support.
5. Small countries may also mitigate so their demands of rich countries are more credible (Genovese, 2020).
6. Replication materials and code can be found at Gazmararian and Milner (2024).
7. Appendix B.3.1 compares our measure to other sources.
8. The sample reflects data availability, the primary constraint being the economic model estimates. Appendix B.3.4 addresses the European Union.
9. Economy-wide laws are those that apply to multiple sectors or are cross-cutting in intention.
10. Appendix A elaborates on the model.
11. Results are robust with Polity (Appendix C.4).
12. Non-geographic sources of vulnerability also exist such as reliance on agriculture.
13. Since the data are comprehensive, we code countries not included as producing no fossil fuels.
14. Results are robust when using oil and coal rents as a share of GDP (Appendix C.4).
15. The negative coefficient on polyarchy implies that democratizing regimes are less likely to enact laws, which is consistent with Andonova et al. (2007), who find that trade liberalization in post-communist countries weakened environmental quality. When looking at the *level* of democracy, there is a positive correlation with mitigation laws, consistent with Bättig and Bernauer (2009).
16. While global warming may affect future disease transmission, this is unlikely during the study.
17. A time-varying moderator would capture democratization, which is not our aim.
18. There is a negligible correlation between fossil fuels and vulnerability: 0.02 ($p = .38$) and -0.07 ($p = .79$) for coal and oil production in 2020, respectively, with future climate damage.
19. After residualizing the country and year fixed effects from fossil fuel production measures, there is some variation but the median residual is close to 0, suggesting no temporal change.
20. Appendix D.5 contains these results and provides further details.

References

- Adger, W. N., Dessai, S., Goulden, M., Hulme, M., Lorenzoni, I., Nelson, D. R., Naess, L. O., Wolf, J., & Wreford, A. (2009). Are there social limits to adaptation to climate change? *Climatic Change*, 93(3-4), 335–354. <https://doi.org/10.1007/s10584-008-9520-z>
- Aklin, M., & Mildenberger, M. (2020). Prisoners of the wrong dilemma: Why distributive conflict, not collective action, characterizes the politics of climate

- change. *Global Environmental Politics*, 20(4), 4–27. https://doi.org/10.1162/glep_a_00578
- Aklin, M., & Urpelainen, J. (2013). Political competition, path dependence, and the strategy of sustainable energy transitions. *American Journal of Political Science*, 57(3):643–658. <https://doi.org/10.1111/ajps.12002>, <https://onlinelibrary.wiley.com/doi/pdf/10.1111/ajps.12002>
- Albright, E., & Crow, D. (2019). Beliefs about climate change in the aftermath of extreme flooding. *Climatic Change*, 155(1), 1–17. <https://doi.org/10.1007/s10584-019-02461-2>
- Andonova, L., Mansfield, E. D., & Milner, H. V. (2007). International trade and environmental policy in the postcommunist world. *Comparative Political Studies*, 40(7), 782–807. <https://doi.org/10.1177/0010414006293215>
- Andonova, L. B., & Sun, Y. (2019). Private governance in developing countries: Drivers of voluntary carbon offset programs. *Global Environmental Politics*, 19(1), 99–122. https://doi.org/10.1162/glep_a_00496
- Arias, S., & Blair, C. (2024). *In the eye of the storm: Hurricanes, climate migration, and climate attitudes*. American Political Science Review.
- Arnold, R. D. (1990). *The logic of congressional action*. Yale University Press.
- Ashworth, S., Bueno de Mesquita, E., & Friedenberg, A. (2018). Learning about voter rationality. *American Journal of Political Science*, 62(1):37–54. <https://doi.org/10.1111/ajps.12334>, <https://onlinelibrary.wiley.com/doi/pdf/10.1111/ajps.12334>
- Baccini, L., & Leemann, L. (2021). Do natural disasters help the environment? How voters respond and what that means. *Political Science Research and Methods*, 9(3), 468–484. <https://doi.org/10.1017/psrm.2020.25>
- Bailer, S., & Weiler, F. (2015). A political economy of positions in climate change negotiations: Economic, structural, domestic, and strategic explanations. *The Review of International Organizations*, 10(1), 43–66. <https://doi.org/10.1007/s11558-014-9198-0>
- Balcazar, C. F., & Kennard, A. (2023). Climate change and political mobilization: Theory and evidence from India.
- Barrett, S. (2003). *Environment and statecraft: The strategy of environmental treaty-making*. Oxford University Press.
- Bättig, M., & Bernauer, T. (2009). National institutions and global public goods: Are democracies more cooperative in climate change policy? *International Organization*, 63(2), 281–308. <https://doi.org/10.1017/s0020818309090092>
- Bechtel, M., & Hainmueller, J. (2011). How lasting is voter gratitude? An analysis of the short- and long-term electoral returns to beneficial policy. *American Journal of Political Science*, 55(4), 852–868. <https://doi.org/10.1111/j.1540-5907.2011.00533.x>
- Bechtel, M., & Mannino, M. (2022). Retrospection, fairness, and economic shocks: How do voters judge policy responses to natural disasters? *Political Science Research and Methods*, 10(2), 260–278. <https://doi.org/10.1017/psrm.2020.39>

- Bechtel, M., & Mannino, M. (2023). Ready when the big one comes? Natural disasters and mass support for preparedness investment. *Political Behavior*, 45(3), 1–26. <https://doi.org/10.1007/s11109-021-09738-2>
- Bechtel, M., & Scheve, K. (2013). Mass support for global climate agreements depends on institutional design. *Proceedings of the National Academy of Sciences*, 110(34), 13763–13768. <https://doi.org/10.1073/pnas.1306374110>
- Bechtel, M. M., Scheve, K. F., & van Lieshout, E. (2020). Constant carbon pricing increases support for climate action compared to ramping up costs over time. *Nature Climate Change*, 10(11), 1004–1009. <https://doi.org/10.1038/s41558-020-00914-6>
- Benegal, S., Azevedo, F., & Holman, M. (2022). Race, ethnicity, and support for climate policy. *Environmental Research Letters*, 17(11), 114060. <https://doi.org/10.1088/1748-9326/aca0ac>
- Binder, S., & Neumayer, E. (2005). Environmental pressure group strength and air pollution: An empirical analysis. *Ecological Economics*, 55(4), 527–538. <https://doi.org/10.1016/j.ecolecon.2004.12.009>
- Birkmann, J., Buckle, P., Jaeger, J., Pelling, M., Setiadi, N., Garschagen, M., Fernando, N., & Kropp, J. (2010). Extreme events and disasters: A window of opportunity for change? Analysis of organizational, institutional and political changes, formal and informal responses after mega-disasters. *Natural Hazards*, 55(3), 637–655. <https://doi.org/10.1007/s11069-008-9319-2>
- Böhler, H., Hanegraaff, M., & Schulze, K. (2022). Does climate advocacy matter? The importance of competing interest groups for national climate policies. *Climate Policy*, 22(8), 961–975. <https://doi.org/10.1080/14693062.2022.2036089>
- Boudet, H., Giordano, L., Zanocco, C., Satein, H., & Whitley, H. (2020). Event attribution and partisanship shape local discussion of climate change after extreme weather. *Nature Climate Change*, 10(1), 69–76. <https://doi.org/10.1038/s41558-019-0641-3>
- Bueno de Mesquita, B., Smith, A., Morrow, J. D., & Siverson, R. M. (2005). *The logic of political survival*. MIT Press.
- Burke, M., Davis, M., & Diffenbaugh, N. (2018). Large potential reduction in economic damages under UN mitigation targets. *Nature*, 557(7706), 549–553. <https://doi.org/10.1038/s41586-018-0071-9>
- Burke, M., Hsiang, S., & Miguel, E. (2015). Global non-linear effect of temperature on economic production. *Nature*, 527(7577), 235–239. <https://doi.org/10.1038/nature15725>
- Bush, S., & Clayton, A. (2023). Facing change: Gender and climate change attitudes worldwide. *American Political Science Review*, 117(2), 591–608. <https://doi.org/10.1017/s0003055422000752>
- Callahan, C., & Mankin, J. (2022). Globally unequal effect of extreme heat on economic growth. *Science Advances*, 8(43), eadd3726. <https://doi.org/10.1126/sciadv.add3726>

- Cao, X., Milner, H. V., Prakash, A., & Ward, H. (2014). Research frontiers in comparative and international environmental politics: An introduction. *Comparative Political Studies*, 47(3), 291–308. <https://doi.org/10.1177/0010414013509567>
- Carleton, T., Jina, A., Delgado, M., Greenstone, M., Houser, T., Hsiang, S., Hultgren, A., Kopp, R., McCusker, K., Nath, I., Rising, J., Rode, A., Seo, H. K., Viaene, A., Yuan, J., & Zhang, A. T. (2022). Valuing the global mortality consequences of climate change accounting for adaptation costs and benefits. *Quarterly Journal of Economics*, 137(4), 2037–2105. <https://doi.org/10.1093/qje/qjac020>
- Chen, C., & Zeckhauser, R. (2018). Collective action in an asymmetric world. *Journal of Public Economics*, 158, 103–112. <https://doi.org/10.1016/j.jpubeco.2017.12.009>
- Cheon, A., & Urpelainen, J. (2013). How do competing interest groups influence environmental policy? The case of renewable electricity in industrialized democracies, 1989–2007. *Political Studies*, 61(4), 874–897. <https://doi.org/10.1111/1467-9248.12006>
- Cinelli, C., & Hazlett, C. (2020). Making sense of sensitivity: Extending omitted variable bias. *Journal of the Royal Statistical Society: Series B*, 82(1), 39–67. <https://doi.org/10.1111/rssb.12348>
- Clark, R., & Zucker, N. (2023). Climate cascades: IOs and the prioritization of climate action. *American Journal of Political Science*. <https://doi.org/10.1111/ajps.12793>
- Colantone, I., Di Lonardo, L., Margalit, Y., & Percoco, M. (2024). The political consequences of green policies: Evidence from Italy. *American Political Science Review*, 118(1), 108–126. <https://doi.org/10.1017/s0003055423000308>
- Colgan, J., Green, J., & Hale, T. (2021). Asset revaluation and the existential politics of climate change. *International Organization*, 75(2), 586–610. <https://doi.org/10.1017/s0020818320000296>
- Conte, B., Desmet, K., Nagy, D. K., & Rossi-Hansberg, E. (2021). Local sectoral specialization in a warming world. *Journal of Economic Geography*, 21(4), 493–530. <https://doi.org/10.1093/jeg/lbab008>
- Cruz, J.-L., & Rossi-Hansberg, E. (2024). The economic geography of global warming. *The Review of Economic Studies*, 91(2), 899–939. <https://doi.org/10.1093/restud/rdad042>
- Dechezleprêtre, A., Fabre, A., Kruse, T., Planterose, B., Chico, A. S., & Stantcheva, S. (2022). *Fighting climate change: International attitudes toward climate policies*. Technical Report w30265. NBER.
- Dell, M., Jones, B. F., & Olken, B. A. (2012). Temperature shocks and economic growth: Evidence from the last half century. *American Economic Journal: Macroeconomics*, 4(3), 66–95. <https://doi.org/10.1257/mac.4.3.66>
- Desmet, K., & Rossi-Hansberg, E. (2015). On the spatial economic impact of global warming. *Journal of Urban Economics*, 88, 16–37. <https://doi.org/10.1016/j.jue.2015.04.004>

- Dolšak, N. (2001). Mitigating global climate change: Why are some countries more committed than others? *Policy Studies Journal*, 29(3), 414–436. <https://doi.org/10.1111/j.1541-0072.2001.tb02102.x>
- Dolšak, N. (2009). Climate change policy implementation: A cross-sectional analysis. *The Review of Policy Research*, 26(5), 551–570. <https://doi.org/10.1111/j.1541-1338.2009.00405.x>
- Egan, P., & Mullin, M. (2017). Climate change: US public opinion. *Annual Review of Political Science*, 20(1), 209–227. <https://doi.org/10.1146/annurev-polisci-051215-022857>
- Elliott, R. J. R., Nguyen-Tien, V., Strobl, E. A., & Tveit, T. (2023). Climate-related natural disasters and voting behavior: Evidence from environmental legislation in the US senate. *Journal of the Association of Environmental and Resource Economists*, 10(3), 753–786. <https://doi.org/10.1086/722540>
- Eskander, S., & Fankhauser, S. (2020). Reduction in greenhouse gas emissions from national climate legislation. *Nature Climate Change*, 10(8), 750–756. <https://doi.org/10.1038/s41558-020-0831-z>
- Eskander, S., Fankhauser, S., & Setzer, J. (2021). Global lessons from climate change legislation and litigation. *Environmental and Energy Policy and the Economy*, 2(1), 44–82. <https://doi.org/10.1086/711306>
- Fankhauser, S., Gennaioli, C., & Collins, M. (2015). The political economy of passing climate change legislation: Evidence from a survey. *Global Environmental Change*, 35, 52–61. <https://doi.org/10.1016/j.gloenvcha.2015.08.008>
- Fankhauser, S., Gennaioli, C., & Collins, M. (2016). Do international factors influence the passage of climate change legislation? *Climate Policy*, 16(3), 318–331. <https://doi.org/10.1080/14693062.2014.1000814>
- Finnegan, J. (2022b). Institutions, climate change, and the foundations of long-term policymaking. *Comparative Political Studies*, 55(7), 1198–1235. <https://doi.org/10.1177/00104140211047416>
- Finnegan, J. (2023). Changing prices in a changing climate: Electoral competition and fossil fuel taxation. *Comparative Political Studies*, 56(8), 1257–1290. <https://doi.org/10.1177/00104140221141853>
- Fiorina, M. (1981). *Retrospective voting in American national elections*. Yale University Press.
- Fox, J., & Van Weelden, R. (2015). Hoping for the best, unprepared for the worst. *Journal of Public Economics*, 130, 59–65. <https://doi.org/10.1016/j.jpubeco.2015.07.007>
- Fuhr, H. (2021). The rise of the Global South and the rise in carbon emissions. *Third World Quarterly*, 42(11), 2724–2746. <https://doi.org/10.1080/01436597.2021.1954901>
- Gagliarducci, S., Paserman, M. D., & Patacchini, E. (2019). Hurricanes, climate change policies and electoral accountability. *NBER*. <https://doi.org/10.3386/w25835>

- Gaikwad, N., Genovese, F., & Tingley, D. (2022). Creating climate coalitions: Mass preferences for compensating vulnerability in the world's two largest democracies. *American Political Science Review*, 116(4), 1165–1183. <https://doi.org/10.1017/s0003055422000223>
- Gailmard, S., & Patty, J. (2019). Preventing prevention. *American Journal of Political Science*, 63(2), 342–352. <https://doi.org/10.1111/ajps.12411>
- Garside, S., & Zhai, H. (2022). If not now, when? Climate disaster and the green vote following the 2021 Germany floods. *Research & Politics*, 9(4), 205316802211415. <https://doi.org/10.1177/20531680221141523>
- Gazmararian, A. F. (2024a). Sources of partisan change: Evidence from the shale gas shock in American coal country. *The Journal of Politics*, Forthcoming. <https://doi.org/10.1086/732949>
- Gazmararian, A. F. (2024b). Valuing the future: Changing time horizons and policy preferences. *Political Behavior*, Forthcoming. <https://doi.org/10.1007/s11109-024-09965-3>
- Gazmararian, A. F., & Krashinsky, L. (2023). Driving labor apart: Climate policy backlash in the American auto corridor. SSRN Working Paper. <https://doi.org/10.2139/ssrn.4633502>
- Gazmararian, A. F., & Milner, H. V. (2023a). Firm lobbying under uncertainty: Evidence from establishment exposure to global warming. Working paper.
- Gazmararian, A. F., & Milner, H. V. (2023b). Personal experience and self-interest: Diverging responses to global warming. OSF pre-print. <https://osf.io/preprints/osf/g4js9>
- Gazmararian, A. F., & Milner, H. V. (2024). *Replication data for political cleavages and changing exposure to global warming*. Technical report. Harvard Dataverse.
- Gazmararian, A. F., & Tingley, D. (2023). *Uncertain futures: How to unlock the climate impasse*. Cambridge University Press.
- Genovese, F. (2019). Sectors, pollution, and trade: How industrial interests shape domestic positions on global climate agreements. *International Studies Quarterly*, 63(4), 819–836. <https://doi.org/10.1093/isq/sqz062>
- Genovese, F. (2020). Weak states at global climate negotiations. *Elements*. Cambridge University Press.
- Gygli, S., Haelg, F., Potrafke, N., & Sturm, J.-E. (2019). The KOF globalisation index – revisited. *The Review of International Organizations*, 14(3), 543–574. <https://doi.org/10.1007/s11558-019-09344-2>
- Hai, Z., & Perlman, R. (2022). Extreme weather events and the politics of climate change attribution. *Science Advances*, 8(36), eabo2190. <https://doi.org/10.1126/sciadv.abo2190>
- Hainmueller, J., Mummolo, J., & Xu, Y. (2019). How much should we trust estimates from multiplicative interaction models? Simple tools to improve empirical practice. *Political Analysis*, 27(2), 163–192. <https://doi.org/10.1017/pan.2018.46>
- Harrison, K., & Sundstrom, L. (2007). The comparative politics of climate change. *Global Environmental Politics*, 7(4), 1–18. <https://doi.org/10.1162/glep.2007.7.4.1>

- Harrison, K., & Sundstrom, L. (2010). Introduction: Global commons, domestic decisions. In K. Harrison, & L. Sundstrom (Eds.), *Global commons, domestic decisions* (pp. 1–22). MIT Press.
- Hazlett, C., & Mildenberger, M. (2020). Wildfire exposure increases pro-environment voting within democratic but not republican areas. *American Political Science Review*, 114(4), 1359–1365. <https://doi.org/10.1017/s0003055420000441>
- Healy, A., & Malhotra, N. (2009). Myopic voters and natural disaster policy. *American Political Science Review*, 103(3), 387–406. <https://doi.org/10.1017/s0003055409990104>
- Herre, B. (2023). Identifying ideologues: A global dataset on political leaders, 1945–2020. *British Journal of Political Science*, 53(2), 740–748. <https://doi.org/10.1017/s0007123422000217>
- Hernstadt, E., & Muehlegger, E. (2014). Weather, salience of climate change and congressional voting. *Journal of Environmental Economics and Management*, 68(3), 435–448. <https://doi.org/10.1016/j.jeem.2014.08.002>
- Hilbig, H., & Riaz, S. (2024). Natural disasters and green party support. *The Journal of Politics*, 86(1), 241–256. <https://doi.org/10.1086/726917>
- Hoffmann, R., Muttarak, R., Peisker, J., & Stanig, P. (2022). Climate change experiences raise environmental concerns and promote Green voting. *Nature Climate Change*, 12(2), 148–155. <https://doi.org/10.1038/s41558-021-01263-8>
- Howe, P., Marlon, J., Mildenberger, M., & Shield, B. (2019). How will climate change shape climate opinion? *Environmental Research Letters*, 14(11), 113001. <https://doi.org/10.1088/1748-9326/ab466a>
- Hsiang, S., Kopp, R., Jina, A., Rising, J., Delgado, M., Mohan, S., Rasmussen, D. J., Muir-Wood, R., Wilson, P., Oppenheimer, M., Larsen, K., & Houser, T. (2017). Estimating economic damage from climate change in the United States. *Science*, 356(6345), 1362–1369. <https://doi.org/10.1126/science.aal4369>
- Hughes, L., & Urpelainen, J. (2015). Interests, institutions, and climate policy: Explaining the choice of policy instruments for the energy sector. *Environmental Science & Policy*, 54, 52–63. <https://doi.org/10.1016/j.envsci.2015.06.014>
- Hurrell, A., & Sengupta, S. (2012). Emerging powers, North-South relations and global climate politics. *International Affairs*, 88(3), 463–484. <https://doi.org/10.1111/j.1468-2346.2012.01084.x>
- IPCC. (2022). Summary for policymakers. *Climate change 2022: Mitigation of climate change*. Cambridge University Press.
- IPCC. (2023). *Climate change 2022 – impacts, adaptation and vulnerability: Working group II contribution to the sixth assessment report of the intergovernmental panel on climate change*. Cambridge University Press.
- Jacobs, A. (2016). Policy making for the long term in advanced democracies. *Annual Review of Political Science*, 19(1), 433–454. <https://doi.org/10.1146/annurev-polisci-110813-034103>

- Jensen, C. B., & Spoon, J.-J. (2011). Testing the 'party matters' thesis: Explaining progress towards kyoto protocol targets. *Political Studies*, 59(1), 99–115. <https://doi.org/10.1111/j.1467-9248.2010.00852.x>
- Kammerer, M., & Namhata, C. (2018). What drives the adoption of climate change mitigation policy? *Policy Sciences*, 51(4), 477–513. <https://doi.org/10.1007/s11077-018-9332-6>
- Kelemen, R. D., & Vogel, D. (2010). Trading places: The role of the United States and the European union in international environmental politics. *Comparative Political Studies*, 43(4), 427–456. <https://doi.org/10.1177/0010414009355265>
- Kennard, A. (2020). The enemy of my enemy: When firms support climate change regulation. *International Organization*, 74(2), 187–221. <https://doi.org/10.1017/s0020818320000107>
- Kennard, A. (2021). My Brother's Keeper: Other-regarding preferences and concern for global climate change. *Review of International Organizations*, 16(2), 345–376. <https://doi.org/10.1007/s11558-019-09374-w>
- Kennard, A., & Schnakenberg, K. (2023). Global climate policy and collective action: A comment. *Global Environmental Politics*, 23(1), 133–144. https://doi.org/10.1162/glep_c_00699
- Keohane, R., & Victor, D. (2016). Cooperation and discord in global climate policy. *Nature Climate Change*, 6(6), 570–575. <https://doi.org/10.1038/nclimate2937>
- Key, V. O. (1961). *Public opinion and American democracy*. Alfred Knopf.
- Kim, S. Y., & Wolinsky-Nahmias, Y. (2014). Cross-national public opinion on climate change: The effects of affluence and vulnerability. *Global Environmental Politics*, 14(1), 79–106. https://doi.org/10.1162/glep_a_00215
- Knill, C., Debus, M., & Heichel, S. (2010). Do parties matter in internationalised policy areas? The impact of political parties on environmental policy outputs in 18 OECD countries, 1970–2000. *European Journal of Political Research*, 49(3), 301–336. <https://doi.org/10.1111/j.1475-6765.2009.01903.x>, <https://onlinelibrary.wiley.com/doi/pdf/10.1111/j.1475-6765.2009.01903.x>
- Kono, D. (2020). Compensating for the climate: Unemployment insurance and climate change votes. *Political Studies*, 68(1), 167–186. <https://doi.org/10.1177/0032321719836066>
- Kotz, M., Wenz, L., Stechemesser, A., Kalkuhl, M., & Levermann, A. (2021). Day-to-day temperature variability reduces economic growth. *Nature Climate Change*, 11(4), 319–325. <https://doi.org/10.1038/s41558-020-00985-5>
- Krasner, S. (1985). *Structural conflict: The third world against global liberalism*. University of California Press.
- Kvaløy, B., Finseraas, H., & Listhaug, O. (2012). The publics' concern for global warming: A cross-national study of 47 countries. *Journal of Peace Research*, 49(1), 11–22. <https://doi.org/10.1177/0022343311425841>
- Liao, Y., & Ruiz Junco, P. (2022). Extreme weather and the politics of climate change: A study of campaign finance and elections. *Journal of Environmental Economics and Management*, 111, 102550. <https://doi.org/10.1016/j.jeeem.2021.102550>

- Lieberman, E., & Ross, M. U. o. C. (2024). Government responses to climate change. *World politics*. Johns Hopkins University Press.
- Liu, L., Wang, Y., & Xu, Y. (2024). A practical guide to counterfactual estimators for causal inference with time-series cross-sectional data. *American Journal of Political Science*, 68(1), 160–176. <https://doi.org/10.1111/ajps.12723>
- Madden, N. J. (2014). Green means stop: Veto players and their impact on climate-change policy outputs. *Environmental Politics*, 23(4), 570–589. <https://doi.org/10.1080/09644016.2014.884301>
- Maggi, G., & Staiger, R. (2022). *International climate agreements and the scream of Greta*. Technical Report 30681, NBER. <https://doi.org/10.2139/ssrn.4282530>
- Marx, S., Weber, E., Orlove, B., Leiserowitz, A., Krantz, D., Roncoli, C., & Phillips, J. (2007). Communication and mental processes: Experiential and analytic processing of uncertain climate information. *Global Environmental Change*, 17(1), 47–58. <https://doi.org/10.1016/j.gloenvcha.2006.10.004>
- Meckling, J. (2011). *Carbon coalitions: Business, climate politics, and the rise of emissions trading*. MIT Press.
- Meckling, J., Lipsy, P. Y., Finnegan, J. J., & Metz, F. (2022). Why nations lead or lag in energy transitions. *Science*, 378(6615), 31–33. <https://doi.org/10.1126/science.adc9973>
- Meckling, J., & Nahm, J. (2022). Strategic state capacity: How states counter opposition to climate policy. *Comparative Political Studies*, 55(3), 493–523. <https://doi.org/10.1177/00104140211024308>
- Michaelowa, K., & Michaelowa, A. (2012). India as an emerging power in international climate negotiations. *Climate Policy*, 12(5), 575–590. <https://doi.org/10.1080/14693062.2012.691226>
- Mildenberger, M. (2020). *Carbon captured: How business and labor control climate politics*. MIT Press.
- Nachmany, M., Fankhauser, S., Setzer, J., & Averchenkova, A. (2017). Global trends in climate change legislation and litigation. Grantham Research Institute. Technical report.
- Oliver, J. (2019). Here's a truth few dare to utter: Canada will benefit from climate change. *Financial post*.
- Ostrom, E. (2009). *A polycentric approach for coping with climate change*. The World Bank.
- Paterson, M., & Grubb, M. (1992). The international politics of climate change. *International Affairs*, 68(2), 293–310. <https://doi.org/10.2307/2623216>
- Quiroz Flores, A., & Smith, A. (2013). Leader survival and natural disasters. *British Journal of Political Science*, 43(4), 821–843. <https://doi.org/10.1017/s0007123412000609>
- Roberts, J. T., & Parks, B. (2007). *A climate of injustice: Global inequality, North-South politics, and climate policy*. MIT Press.

- Robiou du Pont, Y., & Meinshausen, M. (2018). Warming assessment of the bottom-up Paris Agreement emissions pledges. *Nature Communications*, 9(1), 4810. <https://doi.org/10.1038/s41467-018-07223-9>
- Rode, A., Carleton, T., Delgado, M., Greenstone, M., Houser, T., Hsiang, S., Hultgren, A., Jina, A., Kopp, R. E., McCusker, K. E., Nath, I., Rising, J., & Yuan, J. (2021). Estimating a social cost of carbon for global energy consumption. *Nature*, 598(7880), 308–314. <https://doi.org/10.1038/s41586-021-03883-8>
- Rowan, S. (2021). Does institutional proliferation undermine cooperation? Theory and evidence from climate change. *International Studies Quarterly*, 65(2), 461–475. <https://doi.org/10.1093/isq/sqaa092>
- Schaffer, L. M., & Bernauer, T. (2014). Explaining government choices for promoting renewable energy. *Energy Policy*, 68, 15–27. <https://doi.org/10.1016/j.enpol.2013.12.064>
- Schaffer, L. M., Oehl, B., & Bernauer, T. (2022). Are policymakers responsive to public demand in climate politics? *Journal of Public Policy*, 42(1), 136–164. <https://doi.org/10.1017/s0143814x21000088>
- Schulze, K. (2021). Policy characteristics, electoral cycles, and the partisan politics of climate change. *Global Environmental Politics*, 21(2), 44–72. https://doi.org/10.1162/glep_a_00593
- Sforna, G. (2019). Climate change and developing countries: From background actors to protagonists of climate negotiations. *International Environmental Agreements: Politics, Law and Economics*, 19(3), 273–295. <https://doi.org/10.1007/s10784-019-09435-w>
- Shao, E. (2022). *A core question at COP27: Who will pay for climate change?* New York Times.
- Spence, A., Poortinga, W., Butler, C., & Pidgeon, N. F. (2011). Perceptions of climate change and willingness to save energy related to flood experience. *Nature Climate Change*, 1(1), 46–49. <https://doi.org/10.1038/nclimate1059>
- Sprinz, D., & Vaahtoranta, T. (1994). The interest-based explanation of international environmental policy. *International Organization*, 48(1), 77–105. <https://doi.org/10.1017/s0020818300000825>
- Steinebach, Y., Fernández-i Marín, X., & Aschenbrenner, C. (2021). Who puts a price on carbon, why and how? A global empirical analysis of carbon pricing policies. *Climate Policy*, 21(3), 277–289. <https://doi.org/10.1080/14693062.2020.1824890>
- Stokes, L. (2016). Electoral backlash against climate policy: A natural experiment on retrospective voting and local resistance to public policy. *American Journal of Political Science*, 60(4), 958–974. <https://doi.org/10.1111/ajps.12220>
- Stokes, L. (2020). *Short circuiting policy: Interest groups and the battle over clean energy and climate policy in the American states*. Oxford University Press.
- Stokes, L., & Warshaw, C. (2017). Renewable energy policy design and framing influence public support in the United States. *Nature Energy*, 2(8), 17107. <https://doi.org/10.1038/nenergy.2017.107>

- Tingley, D., & Tomz, M. (2014). Conditional cooperation and climate change. *Comparative Political Studies*, 47(3), 344–368. <https://doi.org/10.1177/0010414013509571>
- Tørstad, V., Sælen, H., & Bøyum, L. S. (2020). The domestic politics of international climate commitments: Which factors explain cross-country variation in NDC ambition? *Environmental Research Letters*, 15(2), 024021. <https://doi.org/10.1088/1748-9326/ab63e0>
- Townshend, T., Fankhauser, S., Aybar, R., Collins, M., Landesman, T., Nachmany, M., & Pavese, C. (2013). How national legislation can help to solve climate change. *Nature Climate Change*, 3(5), 430–432. <https://doi.org/10.1038/nclimate1894>
- Tubi, A., Fischhendler, I., & Feitelson, E. (2012). The effect of vulnerability on climate change mitigation policies. *Global Environmental Change*, 22(2), 472–482. <https://doi.org/10.1016/j.gloenvcha.2012.02.004>
- Victor, D. (2011). *Global warming gridlock*. Cambridge University Press.
- Vihma, A. (2011). India and the global climate governance: Between principles and pragmatism. *The Journal of Environment & Development*, 20(1), 69–94. <https://doi.org/10.1177/1070496510394325>
- Ward, H., & Cao, X. (2012). Domestic and international influences on green taxation. *Comparative Political Studies*, 45(9), 1075–1103. <https://doi.org/10.1177/0010414011434007>
- Weber, E. (2006). Experience-based and description-based perceptions of long-term risk: Why global warming does not scare us (yet). *Climatic Change*, 77(1-2), 103–120. <https://doi.org/10.1007/s10584-006-9060-3>
- Zimmer, A., Jakob, M., & Steckel, J. C. (2015). What motivates Vietnam to strive for a low-carbon economy? *Energy for Sustainable Development*, 24, 19–32. <https://doi.org/10.1016/j.esd.2014.10.003>
- Zucker, N. (2024). Identity, industry, and perceptions of climate futures. *Journal of Politics*, *Forthcoming*.

Author Biographies

Alexander F. Gazmararian is a Ph.D. candidate in the Department of Politics at Princeton University, where he holds the Charlotte Elizabeth Procter Fellowship.

Helen V. Milner is the B. C. Forbes Professor of Politics and International Affairs at Princeton University and the director of the Niehaus Center for Globalization and Governance at Princeton's School of Public and International Affairs.