

**Congress, Climate, and Congress: Green Priorities in the
National Defense Authorization Act, Fiscal Years 2000-2021**

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ABSTRACT

The US military is an underappreciated environmental actor—its importance will increase as climate change intensifies. Congress can use the National Defense Authorization Act (NDAA) to require the Department of Defense to implement green policies, but there is little research on how Congressional priorities have changed over time and between party majorities. This thesis identifies and analyzes changes in the number and content of green sections in NDAA's between fiscal years (FY) 2000 and 2021 by counting and noting the focus of each climate, energy, and environmental section in this period. NDAA analysis was paired with a case study to determine if Democrats and Republicans speak differently about military climate action. My research found no linear trends in the number of green sections in the NDAA nor large changes in the number of sections following changes in Congressional majorities; all three areas received bipartisan support. Across the NDAA's studied, environmental sections focused on ecosystem remediation and management. Differently, the focus of energy and climate sections shifted. Energy sections focused on energy security from FY2007 to FY2013 and energy resilience from FY2018 to FY2021. Renewable energy was also emphasized after FY2007, however, Congress at times sought to limit military renewable energy integration. Climate sections were rare until FY2017, but emphasized adaption measures in FY2020 and FY2021. The case study found Democrats and some Republicans shared concern on the security implications of climate change. These results reflect positively on the potential for bipartisan, ambitious climate and green energy policies.

KEYWORDS

Department of Defense, climate change, energy resilience, renewable energy

INTRODUCTION

The US military is an important, but underappreciated environmental actor. The Department of Defense (DoD) is both one of the largest landlords in the US, responsible for about 28 million square acres of land across the US, and the largest single energy user in the US (Belcher et al. 2020, Light 2013). The DoD is currently heavily reliant on fossil fuels and emitted at least 25,375.8 kt-CO₂e in 2017, making it one of the largest emitters globally (Belcher et al. 2020, Scheffran et al. 2012).

Despite its status as one of the largest carbon emitters, the US military is not immune from the effects of climate change. Military bases, and advanced weaponry on base, have been damaged by extreme weather events; risks to US bases worldwide are projected to grow as climate change intensifies (La Sheir and Stanish 2019, Tritten and Tiron 2020). There is also growing concern climate change could spark conflicts worldwide from water shortages and refugee waves caused by sea level rise and desertification (Busby 2018).

The DoD, and the overall US government, have begun to recognize the military's importance. As early as 2003, the DoD recognized that climate change could negatively impact global security (Townsend and Harris 2004). The military has begun to implement measures to prepare for climate-driven conflicts (La Sheir and Stanish 2019, Ericsson 2016). The US Navy first established a Task Force on Climate Change in 2009 and shifted focus to Arctic issues after recognizing the security implications of rapid changes in the region (Badicheck 2016). The 2010 Quadrennial Defense Review, a report on DoD strategies and priorities, included a Congressionally mandated section on the impact of climate change on capabilities, and the DoD officially recognized climate change as a 'threat multiplier' in the 2014 Quadrennial Defense Review (Parthemore and Rogers 2010, Ericsson 2016).

The DoD's efforts were furthered, but also at times hindered, by the US President. The President is the Commander in Chief of the US military, giving them wide latitudes to set the direction of military efforts (Merrill 1991). President George W. Bush regularly denied the existence of climate change, despite a 2004 report from the Pentagon highlighting the security threats of climate change; however, climate change was first mentioned in the military's National Security Strategy in 2008, at the end of his administration (Turrentine 2018, Townsend and Harris 2004). President Obama recognized the national security implications of climate change and

emphasized the cost and security benefits from emission reductions in his first administration; his re-election in 2012 encouraged DoD green initiatives to grow in initiative and scope, culminating in the DoD officially recognizing climate change as a ‘threat multiplier’ in the 2014 Quadrennial Defense Review (Parthemore and Rogers 2010, Ericsson 2016). In his term, President Trump returned to Bush-era outlooks on climate and refused to recognize climate change as a national security threat in his national security strategy, as well as undermining military climate and clean energy measures during his term (Borger 2017, Tritten and Tiron 2020). President Biden adopted a similar approach to President Obama, and has recognized the national security importance of addressing climate change (Hackbarth 2021). Less than a week after his inauguration, President Biden issued an Executive Order that placed the climate crisis at the center of US foreign policy and national security (Biden 2021).

Congress’s appropriations power gives them a major role in military energy and climate policy. The National Defense Authorization Act (NDAA) sets the annual operating budget for the DoD; the over a thousand-page long document both funds the military and outlines Congressional priorities for national security (Shogan 2011, Nevitt 2016). In recent years, the NDAA has funded climate resilience and energy efficiency measures, and required the military to author studies on climate-related risks to military facilities and operations through riders and normal appropriation measures (La Sier and Stanish 2019 and Jacobson and Ferraro 2019). However, the number and ambition of these measures has varied and there are currently no known trends that explains when Congress places climate-related provisions in the NDAA.

How have green priorities in the NDAA changed between fiscal years 2000 and 2021? To answer this central question, I studied the 22 NDAAAs in my dataset to determine if there were significant changes in the number and content of climate, energy, and environmental sections across this time period. Political majorities in Congress have an outsized impact on what policies are passed; thus, I placed particular emphasis on determining if the number or content of green sections in the NDAA varies when control of the House or Senate changes. Finally, I conducted a case study on Congressional rhetoric surrounding a climate amendment to the FY2018 NDAA to determine if the two political parties speak differently about the national security importance of a greener military.

BACKGROUND

The US military is a key actor for emissions reduction and environmental protection. The DoD manages about 28 million square acres of land in the US, as well as numerous bases and installations around the world (Light 2015). These bases and installations, while reserved for military activities, are also home to numerous ecosystems that are both protected and threatened by military activities (Coates et al. 2011). Although the military initially viewed environmental laws as an encroachment on their ability to train, the value of protected ecosystems on or near bases is increasingly recognized by the military for ecosystem benefits, real-world training environment, and as a buffer-zone from civilian development (Coates et al. 2011). Technology developed by the military, such as GPS and remote sensing, has also created new opportunities for conservation research (Lawrence et al. 2015).

However, military actions can also devastate the natural environment. Nuclear weapons devastate large swaths of land through thermal explosions and resulting blast, and leave radioactive waste that increases the risk of chronic illness and mortality (Lawrence et al. 2015). Training activities, especially ones that use live-fire weaponry, drives localized contamination and environmental degradation (Lawrence et al. 2015). Finally, many military technologies rely on heavy metals, chemicals, or toxins that can contaminate areas for centuries if not properly managed (Lawrence et al. 2015). Thus, although the military has provided some environmental benefits, the overall effect of the military on the physical environment is negative.

The DoD is the largest energy user in the US and the largest global hydrocarbons user, making the military energy use a large issue for US emission reductions (Bletcher et al. 2020). Hydrocarbons are currently necessary for many forms of military transportation and commonly used to provide power for forward deployed or remote military bases (Bletcher et al. 2020). This fossil fuel reliance is reinforced by the structure of military logistics chains which increases the difficulties of a transition to alternative energy (Bletcher et al. 2020).

Despite its reliance on fossil fuels, the DoD has recognized on many occasions that climate change is a national security threat (La Sheir and Stanish 2019). A secret report in 2004 first identified the national security implications of climate change, however, its results were ignored by then-President George W. Bush (Townsend and Harris 2004). The US Navy first recognized climate change as a national security threat in 2007; other branches of the military soon followed

(Gerson and Goodman 2007, La Sheir and Stanish 2019). The 2014 Quadrennial Defense Review clearly outlined the risks climate change poses for national security by increasing the frequency and severity of natural disasters, driving human displacement, and threatening military bases (La Sheir and Stanish 2019). Beyond the risks outlined in the 2014 Review, the DoD is also planning for potential conflicts over increasingly limited water resources and increasingly ice-free Arctic environments, both of which could potentially drive conflict (La Sheir and Stanish 2019).

In the face of this threat, each branch of the military has taken steps to lower emissions through energy efficiency measures and increased use of renewable energy (La Sheir and Stanish 2019). For example, the Navy has outlined plans for increased reliance on alternative fuels, such as biofuels, and the Army increasingly seeks to use renewable energy at bases, demonstrating a commitment by the military to lowering emissions (La Sheir and Stanish 2019). Military demand for advanced renewable energy could help speed the commercialization of new technologies by providing funding for development projects (Light 2015). However, most warfighting systems still rely on fossil fuels, creating continued path-dependency on hydrocarbons as the military continues to commission and build systems that require hydrocarbons (Bletcher et al. 2020).

However, the military does not have unilateral authority. The Constitutional system of checks and balances gives the President authority over the military branch; the executive has wide latitude to create military policies and doctrine that could forward climate action (Merrill 1991). Most importantly, the executive branch sets high-level strategic doctrine and releases periodic updates to these documents to reflect the changing geopolitical environment (Dumont 2019). These documents, including the Quadrennial Defense Review and National Security Strategies, provide an outline of a country's defense strategy and goals and are designed to clearly articulate a nation's national values, core interests, strategic vision, and convey information about emerging challenges governments believe they will face (Dumont 2019).

President Obama used this authority to cement the military as a climate actor during his two terms. The 2010 Quadrennial Defense Review included a Congressionally mandated section on the impact of climate change on capabilities and President Obama emphasized energy efficiency and other benefits from emission reductions in his first administration (Parthemore and Rogers 2010, Ericsson 2016). Following President Obama's re-election in 2012, DoD initiatives grew in ambition and scope; the DoD officially recognizing climate change as a 'threat multiplier' in the 2014 Quadrennial Defense Review (Ericsson 2016).

Former President Obama increased executive climate action during his second term. He authored executive orders to lower federal energy use, integrate climate-resilience in international development projects, and highlighted climate change as one of the top eight priorities for American security in the 2015 National Security Strategy, which sets the tone for overall national security policy in a presidential administration (Badicsek 2016, Ericsson 2016). The Obama White House built on this position by releasing a report entitled “The National Security Implications of a Changing Climate”, which drew on past government strategy documents and military reports to outline the potential national security threats of climate change (Ericsson 2016). The document inspired Congressional interest and likely encouraged the Republican-controlled Congress to ask the DoD to identify the most serious climate-related risks (Ericsson 2016).

Under President Trump, however, addressing climate change was not a priority. Climate change was not listed in President Trump’s 2017 National Security Strategy, a reversal from President Obama (Borger 2017). However, federal climate action has not stopped. Agencies have continued to address climate change – for example, thirteen agencies issued a National Climate Assessment that highlighted the threat of climate change – but tangible actions have been fought or shut down by the President (Eilperin et al. 2019). The Department of Defense has continued to study the impact of climate change on military bases and recently implemented a sustainability plan that would increase renewable energy use in Department facilities (Roblin 2020, Department of Defense 2019).

President Biden has emphasized climate change so far during his term. One of his first Executive Orders required climate considerations to be centered in US foreign affairs and national security, along with a host of internal reforms to ensure the DoD is fully aware of the security implications of climate change (Biden 2021). This Executive Order builds off of President Biden’s long-standing commitment to climate action (Hackbarth 2021).

Congress similarly plays a large role in military affairs. Only Congress has the power to declare war, making them an instrumental actor in military decision making (Council on Foreign Relations 2013). More importantly for this thesis, Congress controls government appropriations. The branch allocates money to the military every year; this gives Congress influence over tangible military decisions bases (Price 2019).

Military funding allocations have, since the 1950s, taken the form of the NDAA. The NDAA is a single, consolidated bill that funds all aspects of military operations for the fiscal year

(FY), including acquisition of new weapons and transports, base management and updates, and troop payments and benefits (Shogan 2011). Beyond funding general military operations, the bill allows Congress to oversee defense priorities and policies that are generally controlled by the Executive branch, as well as require the military to meet Congress's defense priorities (Shogan 2011).

Congress's ability to oversee defense activities through the NDAA, as well as pass most pieces of legislation, rests on the ability of the two major political parties, Democrats and Republicans, to reach a compromise. The gap between the two parties has steadily increased since the early 2000s (Fiorina and Abrams 2008). Both the House and the Senate faced difficulties passing legislation due to diverging views between the two parties, and the gap between Democrats and Republicans has continued to grow (McCarty 2019).

Republicans and Democrats have significantly different levels of support for environmental conservation. According to the League of Conservation Voter's 2019 scorecard, Congressional Republicans on average voted yes on less than 13% of environmental policies that year; comparatively Congressional Democrats voted yes on about 95% of environmental policy (Frazin 2020). Republican's support for deregulation, pro-business attitudes, and donations from oil and gas companies potentially explain lacking Republican support for environmental protection (Coley and Hess 2012, Henjy 2018).

Polarization has been particularly acute on climate issues. Far-right branches of the Republican party are very skeptical of the existence of climate change and historically suggested that climate change is bunk science (Guber et al. 2020, Dunlap et al. 2016). However, that position has slightly moderated and there are signs of some support for climate action at the highest echelons of the Republican party, as Republican Senators have given numerous speeches on the Senate floor declaring climate change a fraud (Guber et al. 2020). Although some members of the Republican party, especially those from districts or states more vulnerable to the physical impacts of climate change, have slightly moderated their position, the majority of Republicans in Congress still seek to deny or downplay the risk of climate change (Dunlap et al. 2016, Guber et al. 2020).

Although polarization has made action in most policy areas difficult, if not impossible, the NDAA has never failed to pass. Unlike other appropriations bills, which has been the subject of numerous fights and resulted in government shutdowns, Congress has approved the NDAA every year (Shogan 2011). Thus, military funding is an outlier in regard to the current polarized politics

that dominate Congress (Shogan 2011, Maher 2020). There are many potential explanations for this trend, including the less-partisan nature of military policy and bipartisan support for protecting the American homeland (Shogan 2011). No matter the explanation, defense funding is a unique area of bipartisan consensus in an increasingly polarized Congress.

Congressional oversight through the NDAA can cover all aspects of defense policy, including environmental, energy, and climate priorities. The DoD has one of the largest budgets of any government agency; it manages sprawling bases around the world and has huge energy requirements, thus making the military a core actor in federal environmental policy (Jacobson and Ferraro 2019). Through the NDAA, Congress can regulate, and sets new policies, for all DoD activities including environmental actions, making it a core piece of environmental legislation (Jacobson and Ferraro 2019).

Beyond the NDAA, however, Congress's role in military climate and environmental policy has been limited. There have been numerous attempts by Congressmen to pass stand-alone resolutions or bills that recognize the national security implications of climate change, but none of these measures have passed either chamber of Congress (La Shier and Stanish 2019). Thus, while Congress has nearly unlimited authority to create and pass legislation addressing the carbon footprint, energy use, or environmental impact of the military, the NDAA has been the sole mechanism by which this authority is exercised.

METHODS

NDAA analysis

To answer my first sub questions on the number of climate, energy, or environmental sections over time and between party majorities, I studied the number of sections that related to energy, environmental, or climate policy for each NDAA between fiscal year 2000 and 2021 and the content of relevant sections. I started by creating a classification system to determine if a section was an energy, environmental, or climate policy. My categorization loosely follows the typology of Jacobson and Ferraro (2019). Climate sections includes natural disaster response planning and response, greenhouse gas mitigation policies or studies, installation resiliency, and any studies or other orders that evaluate the impact of natural disasters and other climate effects

on national security. Energy sections include energy management practices such as energy security and resilience, fuel pricing, military energy resource allocation or transitions, energy use policies or mandates, renewable or alternative energy sources, transportation, or other military infrastructure. Environmental sections include environmental cleanup or remediation measures, fines related to environmental compliance, “green” or environmental-conscious procurement regulations, conservation policies, or species management policies.

Sections that were tangentially related to my search or discouraged green action by the military were excluded from my count. For example, sections that limited renewable energy project construction or biofuel use were excluded. Land conveyances, except for land conveyances with the express purpose of habitat protection or conservation, and construction sections that mandated compliance with existing environmental laws were also excluded. Additionally, sections that eliminate programs or give authority to transfer funds for use in relevant programs in any of these three areas were not included in my calculations.

Once I had my three categories, I searched for relevant policies in each NDAA. I downloaded the final, approved version of each NDAA between fiscal years 2001 and 2021. I then used the table of contents of each NDAA to create an initial list of potentially relevant sections. After, I searched for keywords in each NDAA to find relevant sections. In each document, I searched for ten terms: “environment”, “energy”, “climate”, “fuel”, “oil”, “petroleum”, “emissions”, “conservation”, “remediation”, and “resilience”. Then, I read each section to ensure the term was used as defined in this thesis; for example, I excluded sections that used “environment” to refer to the “threat environment” and sections that used “climate” to refer to the attitudes or standards within the military.

This information was compiled in an excel spreadsheet. Columns were used to indicate policy subtype and each relevant section had its own row in the sheet. I placed a 1 in the cell indicating which policy subtype each section belongs to; 1 was also used to allow for easy summation of the total number of sections in each category and each NDAA. Each row also had a separate cell for notes on the content of the section. At the bottom of each sheet, I used the sum function to find the total number of relevant sections and the number of policies from each of the three categories. Each NDAA was represented on its own sheet within the excel workbook. Once the data was collected, I used Excel to graph the change in policies over time. These graphs mirror

the process used by the Comparative Agendas Project to showcase changing attention in different policy areas (Dowding et al. 2015).

Additionally, I created graphs to show the number of riders, if any, were present each year. Sections that did not require military action, or were not targeted at military bases or installations, were categorized as riders. To visually illustrate this data, I created a new set of tables which had separate columns for the number of riders and a column with the total number of sections minus the number of rider sections. That data was used to create stacked bar graphs to illustrate the proportion of sections in each year and category that were non-germane riders.

To track changes in the content of climate, energy, and environmental section, I took notes on the focus of each relevant subcategory as I added them to my excel spreadsheet. I noted what the amendment was designed to change as well as any relevant key words that could help me sort the section. This information helped ensure my categorization of each section was accurate and provided a baseline for determining changing congressional interest in sub-areas within my three overarching categories. I also took note of section titles that were relevant to my three categories as a further marker of changing congressional interest.

Case study

I conducted a case study to determine if Democrats and Republicans have different outlooks on climate, energy, and environmental priorities in the NDAA. I selected an amendment to the FY2018 NDAA from Rep. Langevin, which recognized climate change as a threat to national security for my case study (Langevin 2017a). The amendment passed with bipartisan support in the Republican-controlled house. I studied public statements, response to reporter questions, and hearing remarks to identify justifications for supporting or opposing the amendment (Fiscal Year 2018 Defense Authorization Markup, Part 2, 2017, Fiscal Year 2018 Defense Authorization Markup, Part 2, 2017, Langevin 2017a, Langevin 2017b, Langevin 2017c, Hescocox 2017). I purchased downloads of the relevant hearings and House proceedings from CSPAN. I used OtterAI software for transcriptions of the hearing. Then, I searched for reporter remarks or I found reporter remarks and public statements using the following searches in Google: langevin amendment climate change national security NDAA 2018; climate change national security NDAA (publish dates limited to 6/1/2017 to 1/1/2018); climate change national security "national

defense authorization act" (publish dates limited to 6/1/2017 to 1/1/2018); and "climate change" "national defense authorization act" (publish dates limited to 6/1/2017 to 1/1/2018). I collected the full text of each statement in an Excel spreadsheet. If a Representative spoke about the amendment multiple times, all statements were included. For each Representative who had spoken on the issue, I also collected information about their political party affiliation, district, and home state.

I found four different categories of statements in support or opposition of the amendment. Group 1 statements opposed the amendment because it would trade off with addressing more important issues, such as counterterrorism or nation-state threats. Group 2 statements opposed the amendment on the ground that it would overstep boundaries by forcing the DoD to address climate issues. Group 3 statements weakly supported the amendment and argued that its singular requirement for the DoD to prepare a report on the national security implications of climate change was not an undue burden. Group 4 statements strongly supported the amendment and argued that climate change was a large national security challenge that the DoD should take large steps to address. When statements could fit into multiple categories, I sorted them based on the speech time that matched each group. I then used my typology, as well as information gathered on the party affiliation of each Representative that spoke on the issue, to determine if there was a difference in partisan support for the amendment. Additionally, I looked at the examples used by each Representative to see if there were certain examples or topics that were emphasized by each party.

RESULTS

There were no clear numerical trends in the number of energy, environmental, or climate policies in the NDAA. The focus of environmental sections across the dataset was stable and emphasized remediation, conservation, and management. However, the focus of the energy and climate categories changed over time; energy focus shifted from energy security to energy resilience and renewable energy became a larger focus while climate adaptation sections grew in prominence after FY2017.

NDAA Analysis

Number of relevant sections

Across the 22 NDAAAs studied, there were 231 energy sections, 180 environmental sections, and 39 climate sections. There was an overall average of 20.59 sections per year, 8.18 environmental sections per year, 10.5 energy sections climate sections per year, and 1.91 climate sections per year. However, the range was quite large across all categories, skewing the means. There was a range of 8 to 50 for total sections, 2 to 19 for environmental sections, 2 to 26 for energy sections, and 0 to 12 for climate sections. The median for total sections was 19, 8 for environment sections, 11 for energy sections, and 1 for climate sections. The number of relevant policies fluctuated year to year without any clear linear trends (Figure 1). Similarly, the number of relevant sections in each category did not change linearly (Figures 2, 3, and 4). However, there were large differences in the number of sections each year. Within my dataset, FY2006 had the lowest number of relevant sections with only 8 sections that year, much lower than the median. Differently, FY2020, the second to last NDAA studied, had the highest number of energy, environment, and climate sections with 49 relevant sections, a 122% percent increase between FY2019 and FY2020 and more than double the median. FY2021 was the next highest year, with 42 relevant sections. Thus, despite fluctuating interests and priorities from year to year, the past two years have seen a marked increase in interest from Congress.

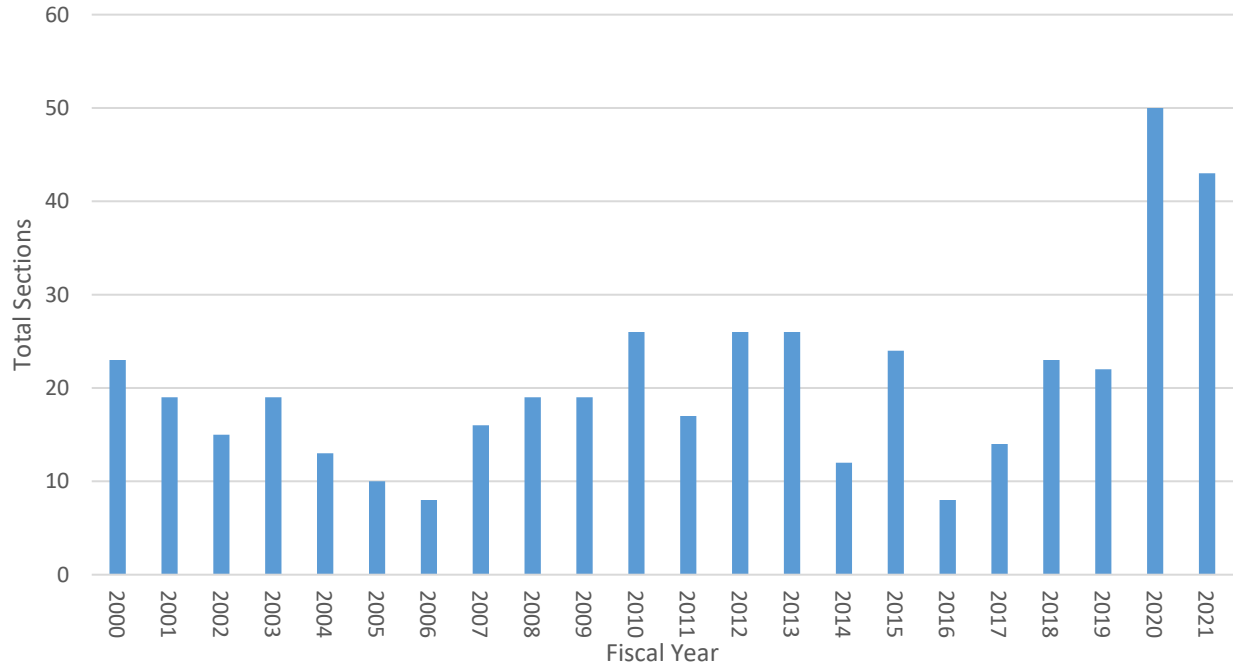


Figure 1. Total energy, environmental, and climate sections per fiscal year.

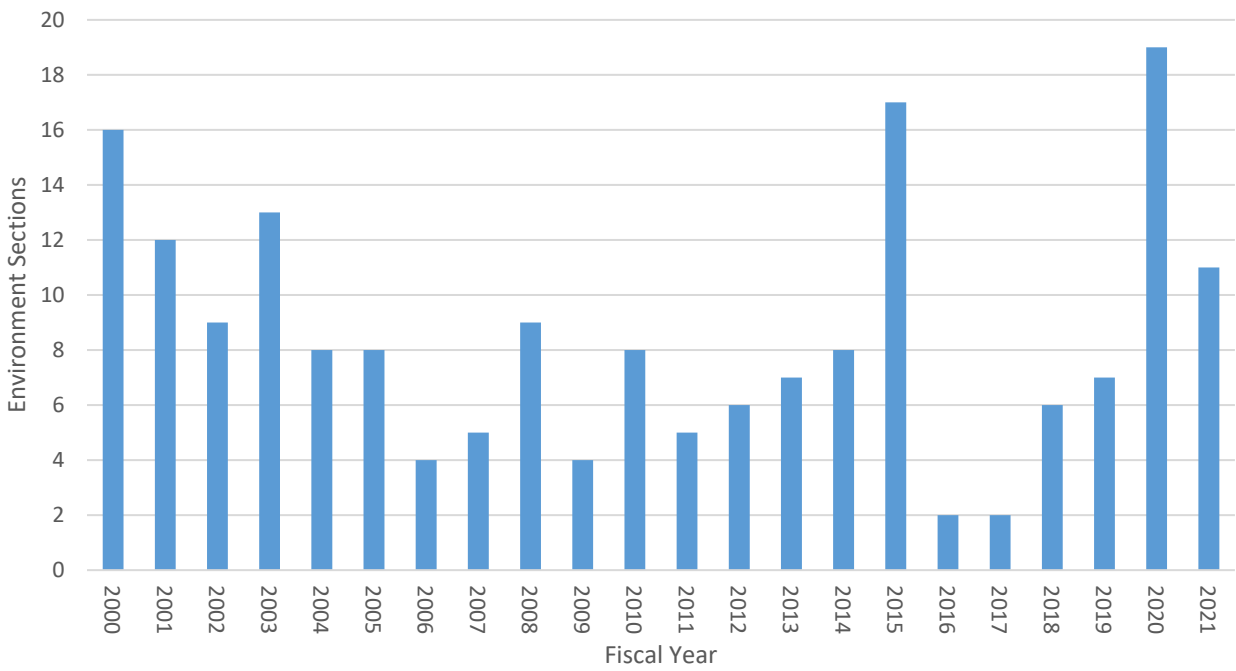


Figure 2. Environmental sections per fiscal year.

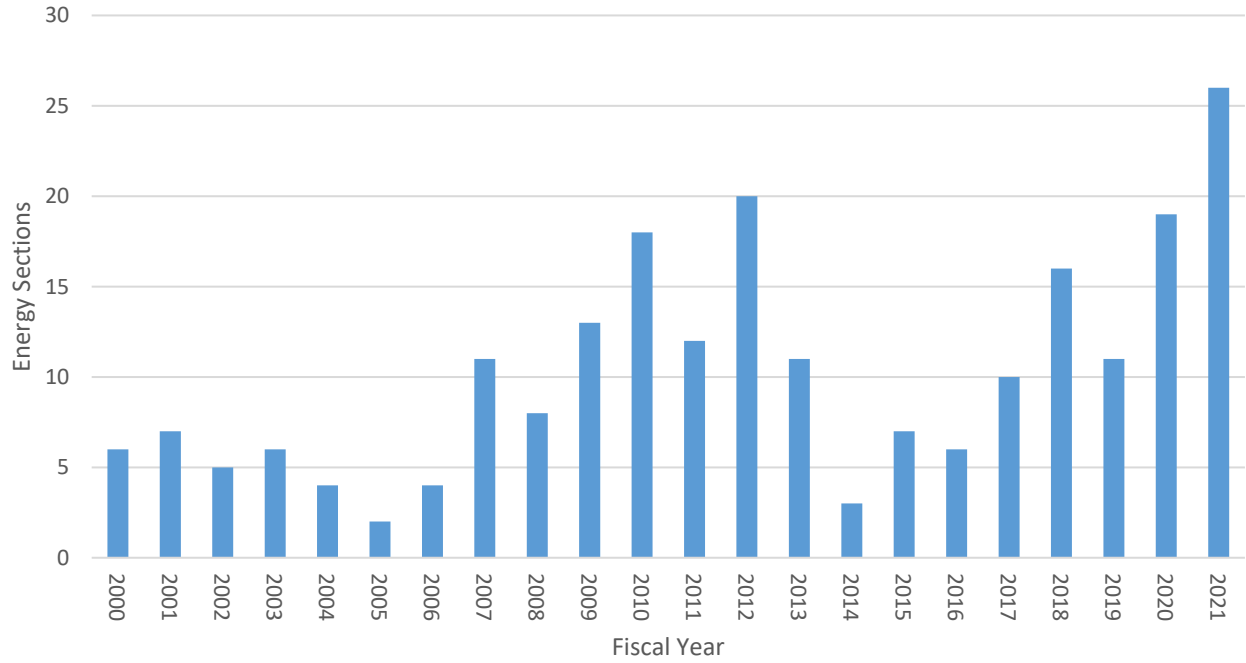


Figure 3. Energy sections per fiscal year.

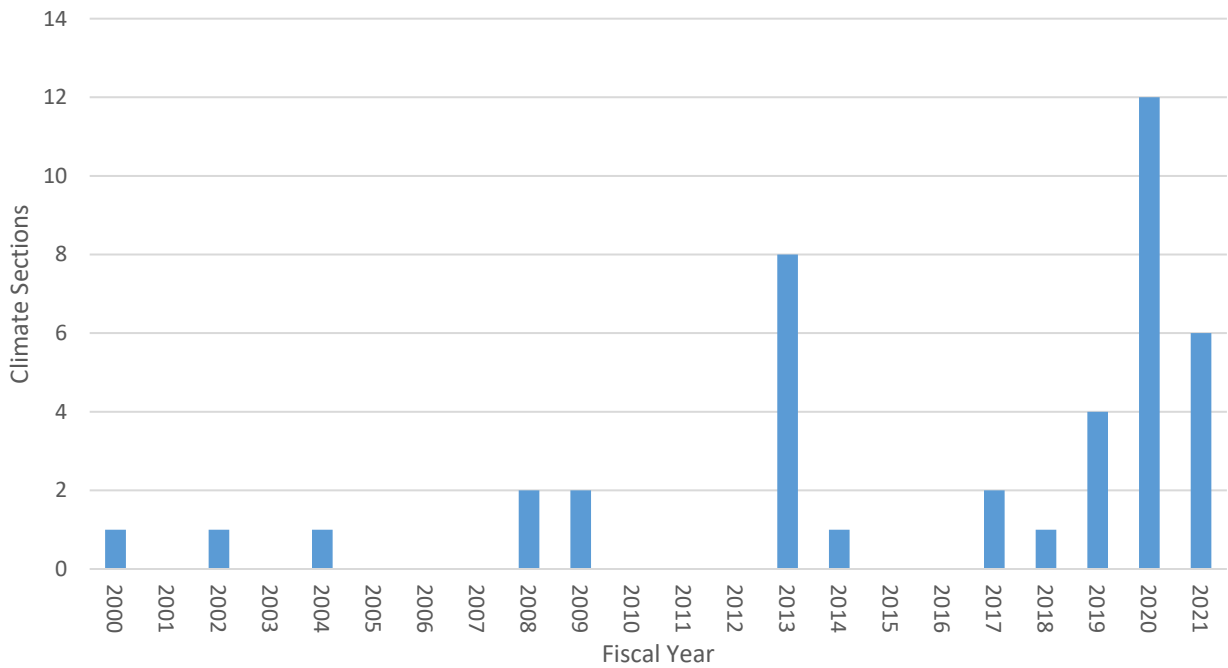
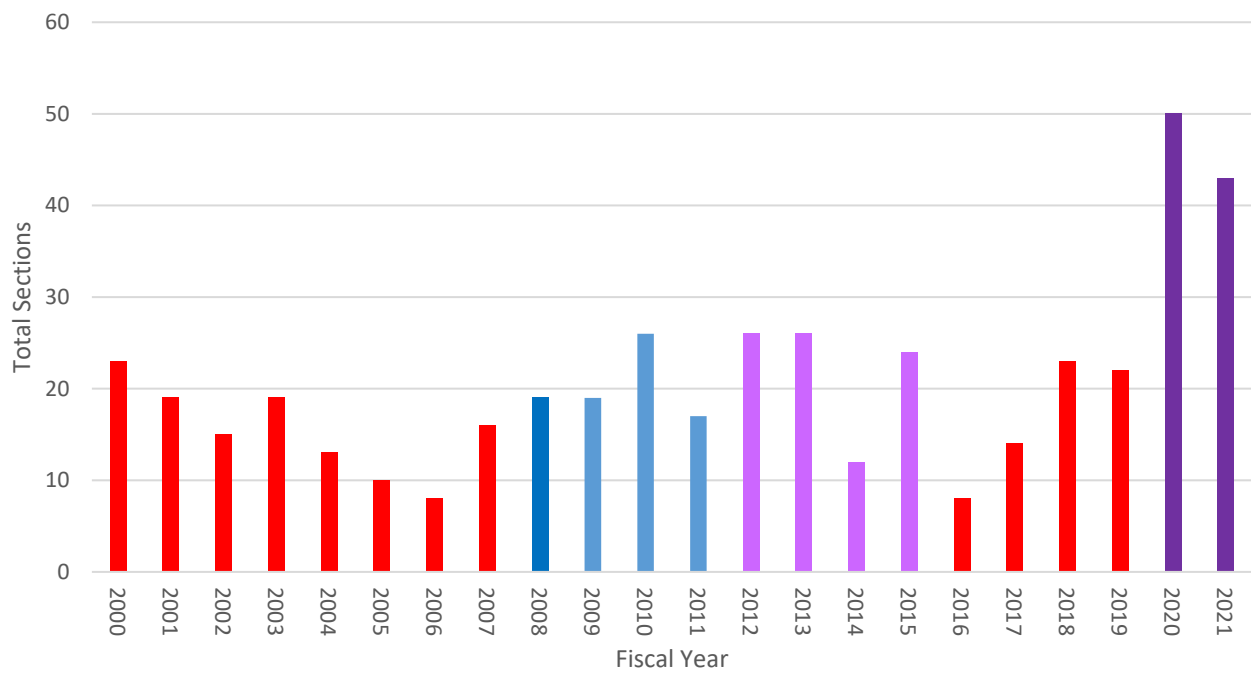


Figure 4. Climate sections per fiscal year.

Impact of political party on number of sections

The number of climate, energy, or environmental sections in the NDAA did not substantially change when the party majorities in Congress shifted (Figure 5). Although some years appeared to show large shifts after Congressional elections, most notably between FY2019 and FY2020, I found those years included riders that made them outliers instead of indicators of a general trend. The large number of these sections included in the FY2020 and FY2021 NDAs could be reflective of the split majority in Congress at the time, when Democrats held a majority in the House and Republicans had a majority in the Senate. However, since these two years are the only years with this split control of Congress, there is insufficient evidence to argue that this is indicative of a larger trend.



Key

- Republican majority in Senate and House
- Democrat majority in Senate and House
- Republican House majority, Democrat Senate majority
- Democrat House majority, Republican Senate majority

Figure 5. Environment, energy, and climate sections per fiscal year, coded for party majority

NDAA section content

The content focus of energy and climate sections changed overtime, while the focus of environmental sections was stable. Content changes in energy and climate sections were somewhat associated with changes in Congressional majorities.

Environmental sections

Across the 22 NDAAAs, the environmental sections centered on remediation, cleanup, and management. Every NDAA funded DOE environmental cleanup. EPA fine payments were the most common environmental sections, and were included in 12 NDAAAs; notably, the FY2015 NDAA removed fiscal year limitations on fine and penalty payments for environmental remediation. The NDAA also sought to address the military's role in spreading invasive species through reports and pilot projects to manage the brown snake population in Guam in FY2008 and FY2010 and regulating water discharge at sea in FY2012.

There were also a number of sections that focused on DoD conservation and environmental protections across my dataset. The Sikes Act, a bill first passed in 1960 which promotes coordination between the DoD and other relevant agencies in wildlife rehabilitation and conservation on military installations, was reauthorized and reformed in FY2004, FY2010, FY2012, FY2014, and FY2015. Congress also sought to minimize the impact of military training activities on species such as migratory birds (FY2003 and FY2009), sea otters (FY2016), and orcas (FY2021). Many NDAAAs also funded DoD conservation efforts, such as wetlands mitigation (FY2004), reef conservation (FY2010), and conservation banking measures (FY2009 and FY2021). Congress also encouraged the DoD to cooperate with other agencies to restore and manage natural habitats (FY2007 and FY2014) as well as Native American tribes (FY2013 and FY2021). Thus, while the content of environmental sections and means of environmental protection changed slightly overtime, the overall goals remained the same across the dataset.

Environmental sections received bipartisan support. The number and focus of sections were relatively consistent across every split of Congress across the time period studied. Although the large drop off between FY2015 and FY2016 appears to be a dramatic change when

Republicans regained the Senate, it was caused by ten non-military sections in the FY2015 NDAA that expanded national wilderness areas.

Energy sections

Energy policy focus experienced a number of changes. Besides three stable sections – funding for DOE national security activities, minimum price for the sale of Naval petroleum reserves, and energy conservation construction – Congress looked into different energy priorities in different time periods. Early energy sections focused on a variety of different areas, such as nuclear technology assistance (FY2003) and alternative fuels in transportation (FY2002 and FY2006). The period between FY2000 and FY2006 had the lowest average number of energy sections in the dataset. That trend changed in FY2007, when Congress began to emphasize military energy security, which focuses on maintaining sufficient energy supplies to meet demand (Winzer 2012); this focus area continued until FY2013. To maintain energy security, Congress required the military to adopt a number of measures such as reporting on fuel cost fluctuations (FY2007), energy efficiency updates (FY2007, FY2008, FY2010, and FY2012), and studies or implementation of alternative fuel systems to ensure access (FY2007, FY2008, FY2009, FY2010, FY2011, and FY2012).

However, Congressional interest in energy security ended in FY2014. The number of energy sections plunged between FY2013 and FY2014, from eleven to three. Although the number of energy sections slightly rebounded in FY2015 to 7 and was about the same at 6 in FY2016, energy was clearly not a Congressional priority from FY2014 to FY2016. The sections included in these NDAAs were also quite scattered. For example, FY2014 only included the three annual sections, FY2015 established new hydropower regulations and established a pilot project for energy efficiency upgrades in the homes of disabled veterans, while FY2016 created monetary reserves for oil price fluctuations and modified energy management reporting requirements.

A clear focus area reappeared in the FY2018 NDAA: energy resilience. Energy resilience is the ability of energy systems to continue to function in spite of perturbations and shocks (Gatto and Drago 2019). Congress expanded the definition of energy resilience (FY2018), set resilience requirements for utilities that provide energy to military installations (FY2017, FY2018, FY2020, and FY2021), studied and proposed methods to decrease energy costs and intensity (FY2017 and

FY2020), and created pilot projects for micro-grids and on-site energy generation (FY2019 and FY2021).

Renewable energy was also a reoccurring area of Congressional interest. Renewable energy first became a topic in the FY2007 NDAA; Congress established that the DoD should seek to produce or procure at least 25% of its energy consumption from renewable sources by 2025. Following NDAAs for FY2008 and FY2012 updated reporting requirements and set interim goals for that target. Additionally, Congress required studies in FY2009 and FY2021 on the effectiveness of on-site renewable energy generation for energy security. However, a number of sections not included in my count sought to limit military renewable energy use, complicating initial findings of bipartisan support for military renewable energy.

Most of the trends identified received bipartisan support. Both energy security and resilience measures succeeded across multiple Congresses and periods of split control. Sections promoting renewable energy were similarly included during periods of split majorities and unilateral control by both parties, illustrating a degree of bipartisan consensus. However, more recent periods of Republican control included sections that limited military use of renewable energy, complicating my results.

Climate Sections

Climate sections were the least common category across the dataset. They were especially rare in early NDAAs, only present in five years between FY2000 and FY2012 (figure 4). The rarity of climate sections in the database made it difficult to identify trends before FY2017, when climate sections first became a regular appearance.

In the early 2000s, there were some years with one relevant climate section. Two of those sections, in FY2000 and FY2002, extended a pilot program for the sale of air pollution emission reduction incentives. This pilot program passed while Republicans had majorities in both houses of Congress. However, the majority of early climate sections focused on the role of the military in responding to natural disasters. Sections between FY2004 and FY2017 authorized the DoD to help provide humanitarian relief for environmental emergencies (FY2004), required reports on national guard readiness for responding to natural disasters (FY2008), mandated reports on Air Force fire-fighting capabilities (FY2009), and allowed aircraft transfers for wildfire suppression (FY2014).

There were a few outliers in this period, in both content and number of climate sections. The FY2008 NDAA contained a section that required the DoD to consider the effect of global warming on its facilities and missions, the first-time climate change was mentioned in the NDAAs studied. FY2009 required the DoD to consider the greenhouse gas emissions in acquisitions, one of the rare sections aimed at limiting military carbon emissions. These two sections were content outliers in this period, as they focused on the national security implications of climate change and emission reductions. However, both were passed when Democrats had majorities in the House and Senate, illustrating early awareness by the Democratic party of the national security implications of climate change. FY2013 was not an outlier in content, because the climate sections that year focused on maintaining and expanding firefighting capabilities, but there was a much higher number of firefighting sections that year. Additionally, the firefighting sections in the FY2013 NDAA were not related to military capabilities, but overall US readiness and funds for firefighting; thus, these sections were likely the result of a rider amendment.

Every NDAA from FY2017 to FY2021 had at least one climate section. In the FY2017 NDAA, Congress authorized the Secretary of the Army to use lower-emissions, cost-competitive technologies for munitions disposal and established a maritime taskforce on extreme weather events. The only climate section in the FY2018 NDAA was the Langevin amendment recognizing climate change as a national security threat, which was analyzed in the case study.

NDAAs for FY2019, FY2020, and FY2021 focused on climate resilience. In these three NDAA's Congress required a number of changes that made the military more prepared to respond and adapt to climate change including: clarifying the role of the military in disaster response (FY2019), increasing notification and disclosure requirements for projects in historic flood plains (FY2019 and FY2020), budgeting for extreme weather events (FY2020), evaluations of extreme weather vulnerabilities at military bases (FY2020), funding installation resilience plans and projects (FY2020 and FY2021), requiring new military construction to incorporate climate mitigation measures (FY2020), and updating adaption roadmaps (FY2021).

Although resilience measures were the most common across these three NDAAs, the FY2020 and FY2021 included further climate sections. Both FY2020 and FY2021 included sections addressing military emissions; FY2020 funded research, development, and testing programs for carbon capture from the ocean and atmosphere while FY2021 required a report on military greenhouse gas emissions. The FY2021 NDAA also further addressed the security

implications of climate change by requiring an evaluation of the threat of climate change induced water insecurity and establishing a climate security roundtable between the DoD and the National Academies of Science.

This new emphasis on climate change in FY2019 began when Republicans had majorities in both the House and Senate. However, the massive jump in the number of climate policies from four in FY2019 to twelve in FY2020 happened after Democrats regained control of the House. Democratic control of the House could thus explain increased emphasis on the security implications of climate change and drive to require the military to adapt. However, Republicans controlled the Senate from FY2016 to the end of the dataset in FY2021; thus, since control of Congress was split, Republican support for these measures was necessary for them to pass. This finding indicates that there is some bipartisan support for military climate resilience and adaption measures.

Riders

There were a number of policy riders in each category. Environmental sections had the highest number of riders, concentrated in FY2015 and FY2020 (figure 6). There were fewer energy riders, with x in year, and both placed economic sanctions on foreign energy supplies (figure 7). FY2008 was the only year with climate riders, but there were a number of non-military climate provisions that year related to firefighting capabilities (figure 8). The riders somewhat skewed numerical analysis, especially in FY2015, by making year to year changes in the number of military green requirements seem larger than expected.

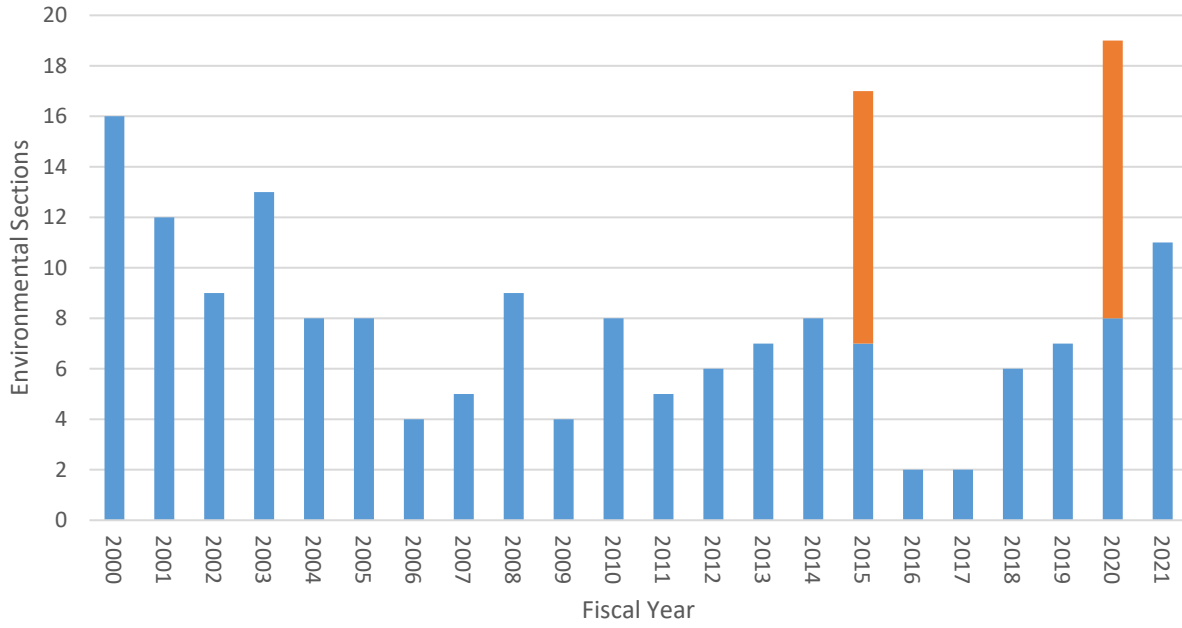


Figure 6. Environmental sections in the NDAA, coded for riders. Riders are colored orange on the chart.

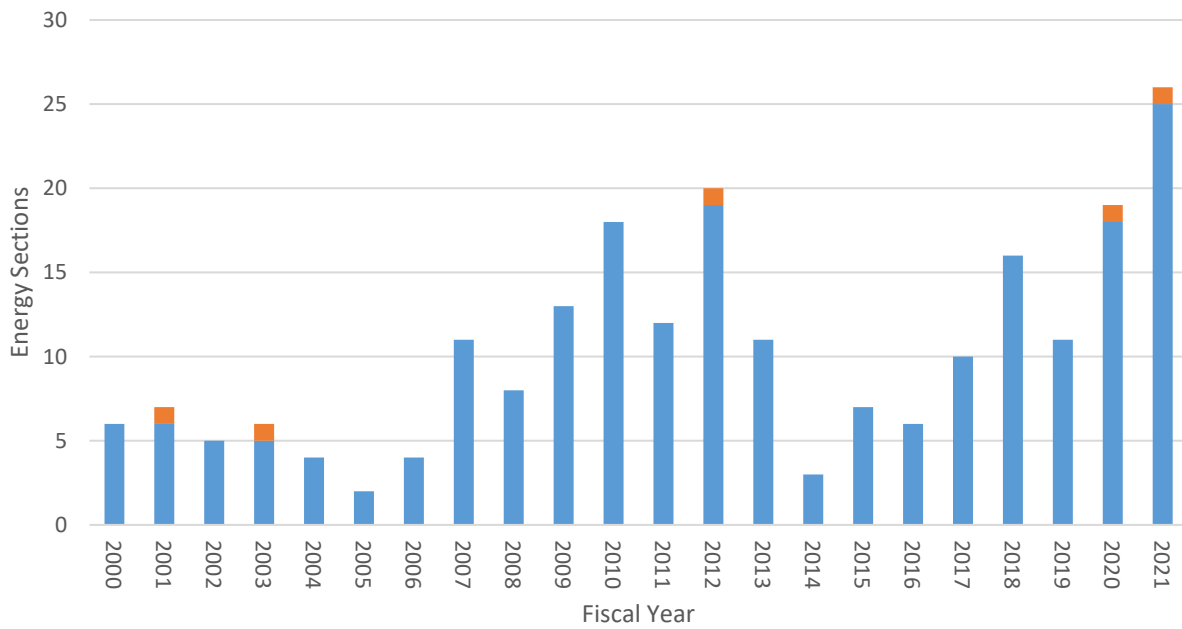


Figure 7. Energy sections in the NDAA, coded for riders. Riders are colored orange on the chart.

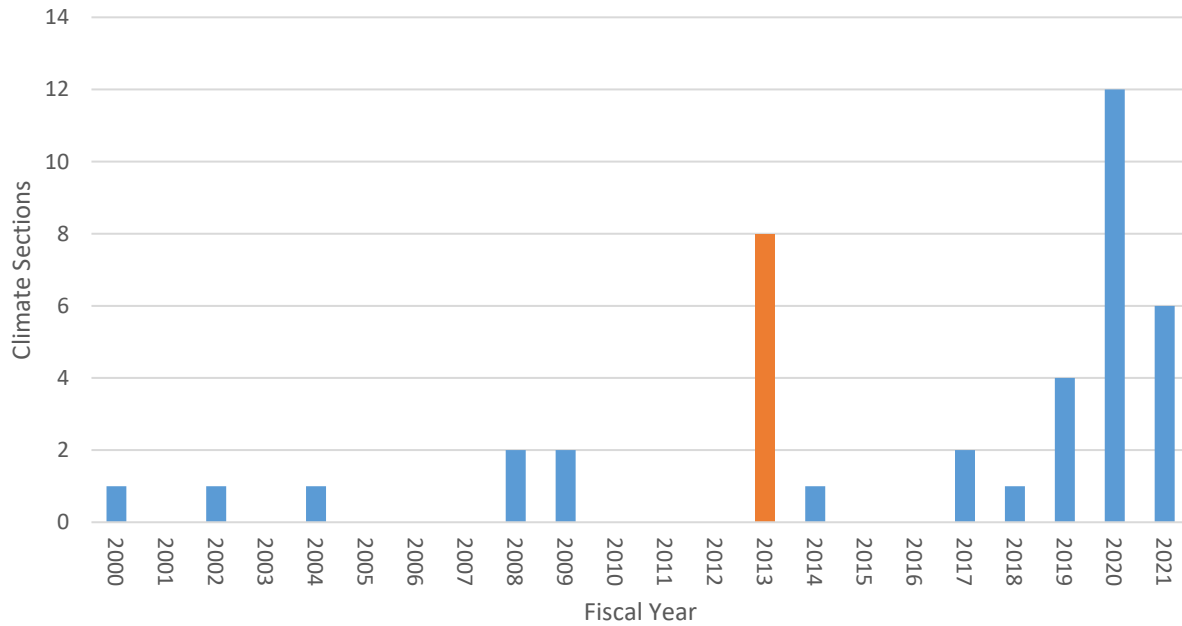


Figure 8. Climate sections in the NDAA, coded for riders. Riders are colored orange on the chart.

Case study

The case study demonstrated that two major political parties speak differently about the content of climate sections. The debate over the Langevin amendment, and the following Perry amendment, to the FY2018 NDAA clearly demonstrated this difference. I found 24 statements and testimonies on the two amendments; 20 of them supported the amendment to some degree. Of the 20 supportive statements, 17 fit into Group 4 and strongly supported the Langevin amendment because of the national security implications of climate change. Most statements in this category directly referenced the strategic implications of sea level rise (Rep. Ros-Lehtinen, R-FL, Rep. Langevin, D-RI, Rep. McEachin, D-VA, Rep. Carbajal, D-CA, Delegate Bordallo, D-Guam, Rep. Peters, D-CA, Rep. Stafanik, R-NY, Rep. Murphy, D-FL), threat to military installations (Rep. Langevin, D-RI, Rep. McEachin, D-VA, Delegate Bordallo, D-Guam, Rep. Shea-Porter, D-NH, Rep. Stafanik, R-NY, Rep. Rosen, D-NV), and Arctic ice melt (Rep. Bridenstine, R-OK, and Rep. Langevin, D-RI, Rep. Stafanik, R-NY, Rep. Rosen, D-NV). Three statements in Group 4 were from Republicans, showcasing some bipartisan concern for the security effects of climate change.

The remaining 3 statements in support of the Langevin amendment fit into Group 3 and supported the amendment because of its limited requirements on the DoD. All statements in Group 3 were from Democrats and emphasized its limited mandate.

I only found four statements that disagreed with the Langevin amendment. Three of these four statements were from Rep. Perry (R-PA), the author of the amendment that would strip the Langevin amendment from the NDAA, and the fourth was from Rep. Cheney (R-WY). Thus, opposition to the Langevin amendment was not bipartisan. Only one statement from Rep. Perry fit into Group 2 and argued that requiring the DoD to address climate change would overstep Congressional boundaries. That sentiment was clear from the first sentence of that statement from Rep. Perry, as he stated “the Secretary of Defense doesn't need Congress to tell him what the threats are” (CSPAN). The other three statements in opposition to the Langevin amendment fit into Group 1 and argued that focusing on climate issues would trade off with addressing other national security threats, such as terrorism and North Korea.

DISCUSSION

The number of energy, environmental, and climate sections in the NDAA fluctuated between FY2000 and FY2021. However, the number of relevant sections did not clearly correlate with Democratic majorities in the both the House and Senate. In contrast to my expectations, the content of environmental sections remained mostly constant over time while the focus of climate and energy sections evolved. Policies in all three categories received some bipartisan support, or at least were passed when each party held a majority in one body of Congress. My findings signal that there is great potential for continued Congressional initiatives to limit the environmental impact of military activities and build a military resilient to climate threats.

Environmental sections

Through a number of different methods and across multiple Congresses, NDAAs did seek to minimize some environmental harms from military activities. The dataset demonstrates that Congress is aware of the environmental impact of military actions and does, in some cases, seek to minimize its impact. However, Congressional action in the NDAA focused more on paying

finances and addressing prior environmental damage than proactively limiting the military's environmental impact.

That being said, Congress has taken steps that recognize the military's potential role as a conservation actor. Sections encouraging conservation, limiting environmental damage, and funding remediation activities were included in NDAAAs studied; thus, Congress has sought to minimize the negative impact the military can have on the physical environment. Although the strength of these conservation policies is unclear and beyond the scope of this thesis, Congress likely has an edge over other agencies in greening the military. Encouraging environmental protection in the military has been a priority since the Clinton administration, but federal agencies have at times faced challenges securing military compliance with statutes such as the National Environmental Policy Act (NEPA) because of military concerns the measures would unnecessarily threaten national security and the unclear balance of power between agencies (Durant 2010). In other circumstances, the military has welcomed environmental conservation policies on installations as a method for creating more real-world training environments and creating a buffer between civilian and military land (Coates et al. 2011).

Military environmental conservation will become more important in the future as environmental destruction continues. US military installations account for about 1% of public lands in the US; although a small percentage, it is a large number of acres and covers diverse ecosystems that are increasingly threatened (Light 2015, Zentelis and Lindenmayer 2014). Open areas on military bases serve as biodiversity hotspots and protect threatened ecosystems from most aspects of human encroachment, such as major construction activities (Lee Jenni et al. 2012, Zentelis and Lindenmayer 2014). Further military activities on these areas could potentially destroy them, as training activities and weapons tests can devastate the natural environment (Lawrence et al. 2015). Many military installations in the US and globally act as quasi ecosystem preserves because they are dominated by open space and protected from non-military development. If carefully regulated, military owned lands could become key environmental resources (Zentelis and Lindenmayer 2014). The US military has also used wildlife preserve areas as a buffer between military bases and cities, creating military benefits additional to environmental preservation by limiting disputes with civilian neighbors (Coates et al. 2011).

Congress is likely the only actor that could successfully encourage military conservation, as other agencies have no means by which to force military activity (Durant 2010, Price 2019).

The DoD can secure waivers from the President that exclude certain military activities from environmental regulations and rules (Babcock 2007). However, since exceptions must be written into the text of laws, it is much harder for the DoD to avoid Congressional environmental regulations (Durant 2010).

The results demonstrated bipartisan support for military conservation activities, a positive sign for future efforts. Through NDAAAs, Congress has funded conservation efforts and required the DoD to cooperate with other agencies and Native tribes to conserve and protect the natural environment. These sections were passed across party control, demonstrating bipartisan support for these actions. This trend breaks with Gershtenson et al. (2006) and Dunlap (2016), who argue that Republicans are less likely to support environmental protection. In particular, Dunlap (2016) argues that Republicans are less likely to support environmental protection because of their opposition to government regulations. That trend is not illustrated in military environmental policies, where changes in majority party did not have a significant difference on the number or content of environmental sections in the NDAA.

However, conflicts over species protection remain, even with some Congressional support for conservation. The DoD can apply for waivers to environmental laws during wars and uses that authority, most recently during the War on Terror (Babcock 2007). Although Congress has successfully passed many conservation policies through the NDAA, it has also used the NDAA to limit applications of environmental laws in the name of national security (Babcock 2007). This tension between environmental protection and national security was especially apparent in NEPA review; the military has applied for waivers that exclude military construction projects from providing Environmental Impact Statements (Babcock 2007).

Additionally, just like federal agencies, the military can lobby Congress to weaken environmental protection statutes. These sections were not included in my dataset, but were found in some NDAAAs; for example, the FY2004 NDAA amended the Endangered Species Act to require an analysis of the national security impact of declaring ecosystems critical habitat for endangered species (Babcock 2007). Additionally, cultural differences between military officers and civilian compliance managers, who oversee implementation of military environmental regulations, can drive disputes, and weaken even the most stringent military conservation requirements (Lee Jenni et al. 2012).

Thus, Congressional support for military conservation is bipartisan but not absolute. Congress is subject to military lobbying, particularly in the NDAA, and not always willing to prioritize environmental protection over national security interests. Internal conflicts between military officers and conservation compliance managers can further weaken environmental protections. Although the branch has sought to limit the impact of the military on the environment, environmental concerns are still secondary to security issues.

Energy sections

Energy policy was not a consistent focus area in the NDAA. There were a few annual policies, such as authorizing the minimum price for petroleum sales from naval reserves and energy conservation construction programs. Beyond those sections, the number of sections and content of each section fluctuated every few years. Two issue areas stood out in my analysis: military energy access and renewable energy policy. Both areas received bipartisan support and were a large number of relevant energy sections with energy security and resilience dominating between FY2007 and FY2013 as well as FY2018 to FY2021 and renewable energy after FY2007. The evolution of these subsections over the time period studied could help illustrate future avenues for bipartisan energy reform.

Energy security and resilience

There was a bipartisan focus on ensuring the military had access to secure and resilient energy sources. This focus started in the FY2007 NDAA, in which Congress emphasized energy security. The topic was given its own subtitle under Military Construction that included a host of provisions related to energy efficiency in new construction and enhancement of DoD energy efficiency and conservation projects. This emphasis on energy security continued through FY2013, with numerous requirements passed including studies on fuel logistics for overseas operations, studies for solar and other alternative energy sources on forward deployed bases, fuel economy requirements, and the establishment of a Director of Operational Energy to oversee these and other changes. The policies implemented in this period were quite strong. They forced major changes in

DoD operations and treatment of energy in military plans, which directly implicated logistic streams and tactics on the ground (Blakeley 2017).

The initial emphasis on energy security was bipartisan and included periods of both Democrat and Republican control. Between the passage of the FY2007 and the FY2013 NDAs, Congressional majorities changed three times. The period began with Republican majorities in the House and Senate, Democrats regained control of the House and Senate after the 2008 elections, Republicans took the House majority after the 2010 elections, and Republicans retook the Senate majority and retained the House majority after the 2012 elections (Amer 2010, Manning 2010, Manning 2014). Despite these numerous party changes, energy security was still a major focus in each NDAA. One potential motivation for this bipartisan focus was the challenges protecting fuel convoys in Iraq; deaths of soldiers protecting transport routes demonstrated the importance of building resilient, protectable energy sources (Blakeley 2017). The large shift in the number and content of energy policies after FY2007 demonstrates a new consensus in Congress on the importance of energy security for military activities.

The initial focus on energy security driven in part by the results of the 2006 midterm elections. Democrats regained the House majority following that election and focused on addressing military energy use, a topic Republicans had been unwilling to prioritize (Blakeley 2017). Democratic staffers worked to explain the importance of energy security to Republicans in language they would understand, and find areas where both parties were concerned about DoD fuel use (Blakeley 2017). Their efforts were further bolstered by a series of committee hearings on multiple aspects of DoD fuel use, clearly demonstrating the importance of the issue to Congress, and a growing awareness of the human costs of fuel transit in Iraq and Afghanistan (Blakeley 2017, Huang 2013).

However, energy security disappeared as a focus area between FY2014 and FY2017. Energy security was not mentioned at all in the FY2014 NDAA; FY2014 also only had three energy sections, the second lowest in the dataset. The FY2014 NDAA was the first of the 113th Congress, potentially indicating a change driven by new majorities in Congress, however, the elections did not have a large impact on the partisan makeup of Congress; Republicans lost some seats but held their majority in the House and Democrats held the Senate (Manning 2014). Given the relatively minor change in the partisan makeup of Congress between the passage of the FY2013

and FY2014 NDAA, it is likely something other than partisan politics, and outside the scope of this research, drove the removal of energy security from the NDAA.

Congressional focus on military energy supply returned in FY2018. FY2018 focused on energy resilience, instead of energy security. Energy resilience focuses more on responding to perturbations and shocks than energy security, though relevant sections still emphasized the importance of maintaining secure energy access for DoD facilities (Gatto and Drago 2019). This resilience focus continued through FY2021. The FY2019 NDAA updated operational energy policies and funded further energy security and resilience upgrades. The FY2020 NDAA required resilience improvements to utility systems, required the Secretary of Defense to ensure critical facilities had sufficient funding to meet energy resilience targets, and required a report on strategies to reduce high energy intensity at military bases. The FY2021 NDAA had the highest number of energy sections of all NDAA's examined and required reforms such as a consideration of energy security and resiliency in life cycle cost assessments for new projects, promotion of energy resiliency in private utilities that provided energy to military bases, funding for resilient on-site energy production at US military bases, and improved energy metering for critical missions.

Similar to the earlier focus on energy security, energy resilience measures were likely spurred by recognition of the threat of energy insecurity. In 2017, the DoD released a report that indicated their energy generation and distribution systems faced significant risks; months later, Congress highlighted energy resilience measures in the FY2018 NDAA (Reintjes 2019). In contrast to from the energy security focus, this emphasis came from the military recognizing its own weaknesses instead of Congress seeking to address what they considered a large threat facing the US military.

Congress's focus on energy resilience, like its prior emphasis on energy security, was bipartisan. Republicans controlled both the House and the Senate when the FY2018 and FY2019 NDAA's were passed; Democrats controlled the House and Republicans the Senate for the passage of FY2020 and FY2021 NDAA's (Manning 2018 and Manning 2020). Despite the power transition in the House following the 2020 elections, the emphasis on energy resilience continued. In some ways, Congress's focus on energy resilience expanded as the body included sections financing resilience upgrades on civilian utilities that provided power to military installations in the FY2020 NDAA.

Bipartisan support for military energy resilience and security, as well as the importance of calls for reforms for Congressional action, reflects positively on the possibility of civilian electrical grid updates. Past NDAAAs, such as the FY2020 NDAA, recognized the role of the civil electric grid for the US military and authorized the DoD to use military construction funds to increase the resilience and security of utilities that service military installations. Although bill financing updates for the entire US electrical would not likely be attached to the NDAA, given the large price tag of those reforms, recent recognition of the national security implications of the civilian electrical grid in the NDAA demonstrates growing Congressional awareness of the grid's importance (Shogan 2011). Recent large-scale blackouts in California and Texas have renewed attention on the importance of electrical grid resilience (Henson 2021). Extreme weather events, forecasted to increase in number and severity as climate change continues, make resiliency reforms more necessary than ever (Henson 2021). Any bill seeking to update the electrical grid will likely face challenges passing Congress due to partisan battles over future energy sources (Christian 2021). The largest drivers of Congressional focus on energy policy present in the status quo, making energy reform particularly likely.

Renewable energy

The results showed limited areas of bipartisan consensus on military use of renewable energy. There was bipartisan recognition of the importance of renewable energy for energy security, but there were also lingering concerns about the operational impact and costs of certain renewable energy technologies. These mixed results mirror broader debates about the implications of a renewable energy transition and traditional partisan disputes over renewable energy.

Although earlier NDAAAs had sections related to alternative fuel sources, the FY2007 NDAA was the first to implement a policy related to military renewable energy. This NDAA established that the DoD should use renewable energy for at least 25% of its energy needs by 2025. The FY2008 NDAA set annual reporting requirements for Department renewable energy use and, to ensure progress was being made towards the 25% goal, the FY2012 NDAA required the DoD to set an interim goal for renewable energy production or procurement. Surprisingly, none of these sections were passed in a year with clear Democratic majorities; Republicans controlled the House and Senate in FY2007, Democrats controlled the House and Senate in FY2008, and Republicans

controlled the House and Democrats the Senate in FY2012 (Amer 2005, Amer 2008, Manning 2012). The Democratic party is generally more supportive of renewable energy than Republicans, which makes Republican support for renewable energy within the DoD an interesting break from previous research (Huang 2013, Clossen 2013).

One possible explanation for this bipartisan support for military renewable energy is its potential implications for military energy security. As earlier established, both parties are concerned about maintaining military energy access (Blakeley 2017). Multiple NDAsAs have included studies on the benefits of renewable energy for energy security—the FY2009 NDAA required a DoD report on the potential benefits of solar power for forward deployment, and the FY2021 NDAA funded a series of pilot projects to determine if onsite renewable energy generation was a cost-effective method for increasing energy security on military bases.

Renewable energy could have large benefits for energy security, especially on forward-deployed bases and in combat areas. Unlike fossil fuels, many forms of renewable energy, such as solar, can be produced on site and thus do not need to be continually resupplied (Samaras et al. 2019). Resupply convoys were targets during the US wars in Iraq and Afghanistan, with an average of one casualty per 24 resupply convoys in Afghanistan (Huang 2013). As explained above, Congress embraced energy security as a way to enhance national security and lower troop risks in ongoing conflict (Blakeley 2019). Renewable energy on military bases could be perceived by both political parties as a way to ensure reliable access to energy, even under adverse circumstances.

However, the reality of renewable energy policy in the military is more complicated and much less bipartisan. Between FY2014 and FY2017, a number of energy provisions limited military alternative and renewable energy sources; these sections were not counted in the dataset but are still important for understanding Congressional action towards military renewable energy. Congress set cost-competitiveness requirements for drop-in biofuels (FY2014, FY2015, and FY2017), required military photo-voltaic solar cells be built in the US (FY2015), and banned construction of renewable energy projects that would obstruct military aviation on federal lands (FY2016). Although Congress sought to speed the construction of renewable energy facilities that could impact military aviation by creating a clearinghouse for these projects in FY2011, and expanding the clearinghouse's mandate in FY2016, its role is limited (Hollingsworth 2018). State governments control renewable energy siting decisions in the vast majority of cases; thus, the clearinghouse is only advisory (Hollingsworth 2018).

Renewable energy even faces barriers as a method for increasing energy security and resiliency. The FY2021 NDAA established a pilot program for diesel-based backup generators as a measure of energy resilience, potentially undermining investment in new, renewable microgrids. Congress has encouraged investment in renewables as a resilience measure in the past, but other statutes such the Energy Policy Act prevent the DoD from using more expensive technologies (Reintjes 2019). Although some renewable energy projects could be cost competitive with fossil fuels, this restriction could push the DoD to use fossil-fuel backup systems to ensure resilience instead of advanced, but more expensive, renewable energy systems (Reintjes 2019).

This ongoing debate demonstrates potential challenges to expanding renewable energy use in national security activities. The timeline of anti-renewable energy policies in the NDAA demonstrates that, besides the initial renewable energy targets, Republicans are more concerned with the negative implications of renewable energy when they have majorities in both the House and the Senate. Wind farms have been proven by multiple studies to negatively impact military flight radars, and, in that one case, the military supports these restrictions to ensure aviation is not negatively impacted (Hollingsworth 2018). Congressional opposition in this one case could be a limited example of successful military lobbying (Light 2013, Blakeley 2017).

However, Republicans have gone farther than limited attempts at regulating wind farms. Leading members of the Republican party loudly criticized efforts to increase green energy in the military, even as military leaders extol the benefits of green sources (Huang 2013). Interestingly, some of these anti-renewable sections in the NDAA, especially those targeting biofuels, were passed through Congress even though the military supported integrating green fuels, challenging the perceived non-partisan nature of the NDAA (Huang 2012, Light 2013, Shogan 2011). Even though the overall NDAA is intended to receive support from both parties, sections on hot-button political topics such as renewable energy are not immune from partisan battles.

Climate Sections

Although climate was not a central issue for Congress, the number of climate-related sections in the NDAA increased over time. However, attention is limited. Most years did not have any climate sections and when climate action was included, the number of sections was lower than energy or environmental sections. Since FY2017, every NDAA has included at least one climate

section, illustrating greater congressional interest in the implications of climate change on military activities.

Some years in the early 2000s had one relevant climate section. For example, climate sections in FY2000 and FY2002 extended a pilot program for the sale of air pollution emission reduction incentives. Limited climate actions between FY2004 and FY2017 focused on the role of the military in responding to natural disasters. These issues, while not focused on lowering military emissions, are necessary adaptation measures as climate change intensifies and thus were included in my typology. Two exceptions to this trend were FY2008, in which Congress required the DoD to consider the impact of global warming on facilities and missions, and FY2009, when Congress required the DoD to consider greenhouse gas emissions when acquiring new weapons systems.

Climate was again on the agenda starting in FY2017 NDAA, although the type of policies varied. In FY2017, Congress mandated the DoD use lower emission and cost competitive technology for munitions disposal. It also contained a Sense of Congress resolution that the DoD should prioritize energy efficiency and climate change policies that would directly benefit US national security. FY2018 only had one climate policy, a controversial amendment that recognized climate change as a national security threat. Although the DoD had recognized climate change as a security threat during the Obama Administration, the amendment required Representatives to vote on the issue, highlighting partisan divisions on the implications of climate change (Brunner 2017). FY2019 had a few reforms that focused on DoD readiness to respond to natural disasters, as well as the impact of wildfires on national security.

FY2020 was a landmark year for Congressional consideration of military climate action. It had the largest number of climate section in the database and addressed a wide variety of issues. The NDAA was a massive investment in resilience as it included sections that required resilience upgrades and plans, studies on the long-term effects of climate change on military capabilities, incorporation of mitigation measures into military construction, and budgeting reforms for rebuilding after extreme weather events.

In 2019, when the FY2020 NDAA was passed, control of Congress was split. Democrats regained the House following the 2018 midterm elections while Republicans controlled the Senate and the Presidency (Manning 2020). The FY2020 NDAA was thus a bipartisan bill that managed to gain support from Congressmen in both parties. In many ways, the fact that these amendments survived is surprising, especially given then-President Trump's refusal to recognize climate

change as anthropogenic and or list it as a national security threat in his administration's National Security Strategy (Broger 2017).

Democrats in the House were likely able to pass these measures because they built off of existing work by the military and growing awareness of the threat climate change poses to military installations. The DoD has recognized climate change as a national security threat since 2007 and the 2010 Quadrennial Defense Review emphasized the need for the DoD to collaborate with other agencies on climate adaption (Badichek 2016, Gerson and Goodman 2007). In 2014, the DoD published its own adaption roadmap to meet the requirements of an executive order from President Obama which outlined efforts to protect bases from extreme weather events and recognized climate change as a threat multiplier (Department of Defense 2014, Badichek 2016). By the time President Trump took office, climate planning and resilience efforts were embedded in the DoD and continued throughout his administration, although direct references to climate change were removed (Tritten and Tiron 2020).

A number of natural disasters damaged military bases in 2018 and 2019, further motivating Congressional action in the FY2020 NDAA. Hurricane Michael, a category 5 hurricane that devastated the Florida panhandle in 2018, nearly destroyed Tyndall Air Force Base and damaged 10% of the US's advanced F-22 Raptor planes (Roblin 2020). That storm, as well as threats to other bases from other hurricanes and wildfires, directly motivated the inclusion of climate-resiliency measures in the FY2020 NDAA (Garamendi 2019). Rep. Garamendi, when speaking on the importance of these amendments, framed them as "sensible provisions" to ensure other bases were not devastated by natural disasters (Garamendi 2019). Although the provisions were not completely bipartisan—some Republican Representatives thought the provisions were a waste of money and challenged the scientifically proven link between climate change and natural disaster intensity—they were successfully passed in the FY2020 NDAA (Tritten and Tiron 2020).

The less visceral Republican responses to climate adaption measures following natural disasters impacting military bases demonstrates changing attitudes among the Republican party. The adaption sections in the FY2020 NDAA were similar to standalone bills that failed, demonstrating new openness to military adaption measures (La Shier and Stanish 2019). Historically, Republicans had done everything in their power to undermine climate science, from bringing snowballs to the Senate floor to disprove planetary warming trends or portraying climate

action as a war on fossil fuels; therefore, even limited support for climate action was not an inevitable conclusion (Guber et al. 2020).

Two factors could potentially explain this shift in Republican attitudes towards climate change. First, framing climate change as a national security issue, and including climate action in the NDAA, could motivate Republican support. Security issues, and foreign policy broadly, are generally areas of larger bipartisan consensus than domestic policy issues (Hurst and Wroe 2016). Bipartisan support for protecting national security could be successfully extended to climate change, if continually framed as a challenge to security (Meise 2020, Nevitt 2020). This perspective could be boosted by climate action through the NDAA, which links the military, one of the most trusted institutions, to support for addressing climate change (Nevitt 2020). However, this explanation is insufficient. Democrats have tried to use national security justifications to encourage support for larger, standalone bills that would require climate mitigation and adaptation issues in all facets of the US economy and society; none of these bills have come close to passing Congress (Nevitt 2020). Thus, the emphasizing the national security implications of climate change is insufficient to explain growing Republican support.

Shifts in public attitudes towards climate change are a more likely explanation for limited Republican acceptance of climate policies. Recent opinion polls found Republicans are more open to climate action than at any time historically and increasingly believe the government should address climate change and encourage clean energy use (Arvin 2021). That attitude might not have completely translated to party leadership, especially in Congress, but could be indicative of growing bipartisan consensus on the necessity of climate action in the coming years (Arvin 2021). Additionally, majority-Republican areas are forecasted to face larger impacts from climate change in the coming decades, potentially forcing the party to re-adjust its position on climate change to continue to win elections (Muro et al. 2019). This explanation is more persuasive, as Republicans from coastal Florida and other at-risk areas make up a substantial portion of Republican representatives in bipartisan climate caucuses (Beitsch 2019).

A whole-of-government approach is necessary to address the national, human, and economic security threats posed by climate change, and thus must go beyond the ambition seen in these NDAA's (Meise 2020). However, the increasingly bipartisan nature of military climate action indicates large-scale climate action is more probable now than it was at any point in the past decades. Bipartisan support, or at least the absence of complete refusal from the Republican party

to discuss the serious implications of climate change, could spur society-wide climate adaptation measures.

Case study implications

The case study of Representative statements on an amendment to the FY2018 NDAA that declared climate change a national security threat further demonstrated growing bipartisan support for climate action. Democrats overwhelmingly agreed that climate change was a national security threat and were joined by some Republican colleagues. However, other Republicans argued the amendment was unnecessary and would trade off with addressing other pressing national security threats. This result matches other research demonstrating that Democrats are more likely to support climate action and view it as a pressing threat (Gruber 2020, Dunlap et al. 2016).

Limited Republican support for the Langevin amendment demonstrates that there is a range of views on the national security implications of climate change within the Republican party. The Republicans that strongly supported the amendment recognized the security implications of climate change, mentioning challenges such as the impact of Arctic ice melt on naval operations and sea level rise on military operations and installations. These Representatives could potentially be persuaded to support larger interventions to lower emissions and improve resiliency outside of the military, especially if mitigation or adaptation policies are specifically linked to specific threats.

However, the five Republicans that spoke on record about the Langevin amendment are a small subset of the Republican party. Rep. Perry's amendment, which would have stripped Rep. Langevin's amendment declaring climate change a national security threat from the FY2018 NDAA, was ultimately defeated in a 185 to 234 vote (Brunner 2017). 46 Republicans joined all House Democrats and voted to support the Langevin amendment, breaking from the rest of their party, which voted to strike down Rep. Langevin's amendment (Brunner 2017). Although the Republicans that spoke in support of the Langevin amendment all gave compelling reasons for the national security implications of climate change, the majority of their caucus disagreed with their concerns.

The results showcase limited Republican support for designating climate change as a national security threat, which aligns with Guber et al.'s (2020) data, showing that Republicans in Congress have, somewhat, softened their stance away from outright climate denial. In fact,

Republicans were more likely to link climate issues to national security concerns than Democrats between 1996 and 2015 (Guber et al. 2020). This change in stance, and strong support of the Langevin amendment from some Republican Representatives, illustrates that there is at least a subset of the Republican party that supports climate action. Growing Republican support for climate action is further evidenced by a growing number of bipartisan caucuses aimed at addressing the climate threat (Beistch 2019). These factors could create greater bipartisan support for future climate action.

However, the climate sections that have recently passed in the NDAA focused on climate resilience and adaption, not reducing emissions. Although resilience and adaption measures are necessary to ensure the military can continue to operate and provide aid in adverse climate conditions, the military is also a large source of carbon emissions, emitting at least 25,375.8 kt-CO₂e in 2017 (Belcher et al. 2020). Congress has not addressed the military's substantial carbon footprint in any meaningful way in the NDAA. Although there are a number of possible explanations for this trend, such as difficulties recentering military logistics away from fossil fuels, it is troubling that limiting military emissions has not been as much of a priority as climate adaption (Belcher et al. 2020).

Riders

To a certain extent, the numerical analysis over the study period was skewed by a number of non-military provisions attached to the NDAA. The NDAA, which must pass annually to fund military activities, commonly has non-germane amendments attached to it in a last resort attempt to get the legislation passed (Shogan 2011). The FY2015 and FY2020 NDAAs had the two highest number of environmental sections, however, more than half of the relevant sections did not address military issues (figure 6). Ten of the 17 environmental sections in the FY2015 NDAA added land to national seashores, wildlife heritage areas, or national wilderness areas; 11 of the 19 environmental sections in the FY2020 NDAA addressed illegal, unreported, or unregulated fishing.

Riders also impacted results in the climate section (figure 8). FY2013 was an outlier in the climate category, with eight categories, however they centered on federal assistance to firefighters. The climate categorization was kept broad, and included natural planning and response policies to

account for responses to extreme weather events strengthened by climate change, thus, firefighting sections were included in the count. Although the military can be involved in firefighting, the sections in the FY2013 did not focus on the role of the military in responding to wildfires, or even response to wildfires intensified by climate change, but instead was broadly focused on wildfire response.

The energy riders in the dataset overwhelmingly focused on economic sanctions and their impact on energy supply. However, riders were much less common than environmental riders and had a smaller impact on the numerical results (figure 7). There were a number of years where sanctions were authorized with the NDAA; the FY2013 NDAA included a comprehensive sanctions package against Iran and both the FY2020 and FY2021 NDAAs sanctioned entities constructing new Russian gas pipelines to Europe. Unlike the environment and climate riders, all sanction sections were not counted because the majority did not directly reference or impact US energy. Thus, the energy riders did not produce outlier years like the environment and climate riders.

The success of these non-germane amendments demonstrates another possible way the NDAA can further environmental policies in the US. Congress could attach national energy, environmental, or climate policies to the NDAA to pass legislation that would otherwise be unlikely to pass. However, committee staff and Congressional Budget Office requirements have worked to limit the nature of even relevant provisions if they are perceived as unpalatable (Shogan 2011, Blakeley 2017). Thus, only smaller bills could likely be successfully attached to the NDAA for passage (Shogan 2011).

Limitations & Future Study

This research faced several limitations. First, because I focused on the content of each NDAA, instead of overall statements for support or opposition to each amendment, it is beyond the scope of my research to determine why certain policies were implemented at different times. This problem is particularly acute with the case study, which was limited to one NDAA amendment. Case studies from other years could have provided more information on the motivations of Congressional action and perhaps even the reason certain policies were chosen over others. However, given the research completed, the trends identified could thus just be the work

of a few well-positioned staff members, as illustrated in Blakeley's (2017) case studies instead of evidence of changing consensus within Congress. Future research could seek to identify the drivers of those changes and determine if increased Congressional awareness of, for example, the national security implications of climate change, translates into bipartisan consensus on the need for climate action outside of the NDAA. Further case studies could help identify why these changes have occurred, especially if paired with interviews that illuminate the policymaking process and explain why certain amendments made it into the final NDAA. Additionally, a review of rejected energy, environmental, or climate NDAA sections could identify areas of disunity and the limitations of Congress's willingness to address the military's ecological and carbon footprint.

Second, it is difficult to draw conclusions about broader partisan attitudes from the NDAA. The NDAA is a unique piece of legislation as it is the only funding authorization bill that passed every year (Shogan 2011). Representatives and Senators likely feel more pressure to vote for the overall bill, even if they disagree with certain amendments, because of bipartisan support for passage, its institutionalized hearing process, and the relatively non-partisan nature of defense policymaking (Shogan 2011). On the one hand, its continual passage makes it an ideal point of study because it is updated annually. However, given the non-partisan nature of the bill and need for annual defense funding, compromise on climate and energy issues is likely easier to reach on the NDAA than in other legislation. This challenge is another reason annual case studies would have helped identify if changing Congressional attitudes were limited to the NDAA or indicative of broader outlook changes.

Quantitative analysis of the NDAAs studied could provide further information on the partisan nature of these sections and provide other measures of Congressional interest. This research could provide further information on whether party control impacts environmental policy in the NDAA. Furthermore, researchers seeking a more quantitative approach could study the amount of money allocated to climate, energy, and environmental policies. Military funding is subject to budget caps (Shogan 2011). Thus, studying how much money was given to environmental issues, such as energy efficiency or resilient construction, could provide greater insight on the relative importance Congress gave to these issues.

Conclusion

Congress is a key actor for greening the US military. The branch has unique powers to force accountability and encourage military action through their oversight and appropriations powers. Surprisingly, there was bipartisan support for most energy, environmental, and climate policies in the NDAA's studied. There were not significant drops in the number of relevant sections when Republicans returned to power; years with split majorities such as FY2020 and FY2013 had some of the highest numbers of green policies. However, clean energy and climate policies still faced large opposition from Congressional Republicans and were likely passed with bare-minimum support from the party. There is reason for optimism, as the case study, and other research on climate change views among Republicans, highlighted growing awareness of the climate threat and importance of climate action (Arvin 2021, Guber 2020). External nudges were necessary to drive the inclusion of "green" policies in NDAA's; external events and reports, as well as engaged and informed staffers, drove large-scale energy and climate action across the dataset.

More broadly, growing bipartisan support for military climate adaptation and energy resiliency standards could set the stage for ambitious climate and energy policy action in the near future. Although the NDAA is a uniquely bipartisan piece of legislation, recent weather-driven, large-scale blackouts in California and Texas highlighted the threat climate change poses to the US energy system and society (Henson 2021). Congress should put aside bipartisan bickering and broaden its acceptance of resilience policies from the military to all of the US.

ACKNOWLEDGEMENTS

This thesis would not have been possible without endless support from my thesis advisor, Patina Mendez, who answered my endless questions over emails and Zoom throughout this year. Thank you to my parents, for your endless support and constant requests for updates on my progress. My peer editing group provided invaluable feedback and support throughout the process. Finally, thank you to all my friends for supporting me on this research and writing journey.

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