The Ecology of Elections: A Bibliometric Study of the WoS-indexed Articles on Environmental Voting Behavior

Seçimlerin Ekolojisi: Çevreci Oy Verme Davranışına İlişkin WoS Dizinli Makalelerin Bibliyometrik Bir İncelemesi

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Abstract: *This research constitutes a bibliometric investigation of environmental voting behavior, concentrating on 535 articles indexed in Web of Science from 1991 to 2024. The research employed the Bibliometrix package in R to analyze citation trends, prominent authors, journals, and interdisciplinary collaborations. This research revealed a notable increase in academic interest, especially following the early 1990s, fueled by heightened public apprehension regarding climate change and environmental crises. Political science has emerged as the leading field, accounting for 38 percent of the total number of articles in the dataset. According to the citation scores, the American Political Science Review and the American Journal of Political Science stood out as the first two sources, whereas research from the United States dominated the field. Key findings underscore the impact of green parties on conventional political conduct, particularly in Europe where environmental policies have become increasingly prominent. The research also demonstrated the influence of early sources of studying voting behavior, such as Rational Choice Theory. A cluster analysis utilizing bibliographic coupling of articles in the dataset revealed six thematic domains encompassing the ideological dynamics of environmental voting and the psychological underpinnings of voter behavior. The analysis indicated the increasing impact of environmental issues on the political sphere, and offered insights into how these concerns influence voters' preferences and policy decisions. This study enhances the understanding of the intellectual framework surrounding environmental voting behavior and provides a basis for future research on the nexus between ecology and electoral studies.*

Keywords: *Voting behavior, Elections, Environmentalism, Greens, Bibliometrics*

Özet: *Bu araştırma, çevresel oy verme davranışına yönelik bibliyometrik bir inceleme olup, 1991-2024 yılları arasında Web of Science'ta dizinlenen 535 makaleye odaklanmaktadır. Çalışmada, atıf eğilimleri, önde gelen yazarlar, dergiler ve disiplinlerarası iş birliklerini analiz etmek için R yazılımındaki Bibliometrix paketi kullanılmıştır. Araştırma, özellikle 1990'lı yılların başından itibaren akademik ilginin önemli ölçüde arttığını ve bu durumun iklim değişikliği ve çevresel krizlere yönelik kamu kaygılarının yükselmesiyle desteklendiğini ortaya koymaktadır. Siyaset bilimi, veri setindeki toplam makalelerin %38'ini oluşturarak en baskın alan olarak öne çıkmaktadır. Atıf puanlarına göre* American Political Science Review *ve* American Journal of Political Science *en önde gelen iki dergi olurken, ABD merkezli araştırmalar alanda büyük ölçüde baskındır. Temel bulgular, yeşil partilerin geleneksel siyasal davranışlar üzerindeki etkisini vurgulamakta, özellikle Avrupa'da çevre politikalarının giderek daha belirgin hale geldiğini göstermektedir. Çalışma ayrıca Rasyonel Tercih Teorisi gibi oy verme davranışını inceleyen erken dönem kaynakların etkisini de ortaya koymaktadır. Veri setindeki makalelerin bibliyografik eşleşmesine dayalı bir kümeleme analizi, çevresel oy verme davranışının ideolojik dinamikleri ve seçmen davranışının psikolojik temelleri de dahil olmak üzere altı tematik alan belirlemiştir. Analiz, çevresel meselelerin siyaset üzerindeki artan etkisini göstermekte ve bu meselelerin seçmen tercihleri ile politika kararlarını nasıl şekillendirdiğine dair içgörüler sunmaktadır. Bu çalışma, çevresel oy verme davranışına ilişkin entelektüel çerçevenin anlaşılmasını derinleştirirken, ekoloji ve seçim çalışmaları arasındaki ilişki üzerine gelecekteki araştırmalar için bir temel oluşturmaktadır.*

Anahtar Kelimeler: *Seçmen davranışı, Seçimler, Çevrecilik, Yeşiller, Bibliyometri*

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1. Introduction

Environmental concerns have become a defining issue in our era, rather than a distant consideration, as wildfires intensify, sea levels rise, and global temperatures increase. How do these global issues influence voter electoral decisions? Examining the intersection between ecology and voting behavior has become increasingly significant, as it pertains to the fundamental principles of democracy in an era of environmental change, where voters determine not only the fate of candidates but also that of the planet. Consequently, environmentalist voting behavior can be conceptualized as voters' decision-making process influenced by environmental issues, policies, and concerns. In this context, environmental voting represents the cognizance and attitude of individuals towards environmental protection, climate change, and sustainability impacts that inform their voting choices, particularly in elections in which political parties or candidates prioritize environmental platforms (IPCC, 2022, 2023). Thus, factors such as climate crises, environmental degradation, and the perceived efficacy of environmental governance contribute to shaping this electoral propensity, which is typically associated with support for green parties or candidates who prioritize environmental policies. This growing environmental consciousness among voters has led researchers to explore the complex interplay between ecological concerns and electoral outcomes in various political landscapes.

This study investigates the academic domain of environmental voting behavior by examining the evolution of scholarly interest in this topic in recent years. As presented in Table 1, through a bibliometric analysis of articles indexed by the Web of Science (WoS) between 1991 and 2024, we examined the primary sources, authors, cited references, patterns, and multidisciplinary collaborations that have shaped this expanding field. Research aimed at elucidating the influence of climate issues on political behavior has accelerated in parallel with the urgency of this problem. This study captures that dynamic and provides insight into how environmental concerns have not only transformed political discourse but also altered voter engagement with elections.

Table 1. Research focus and questions

Research Focus	Research Question
Influence of early voting behavior literature	How has early literature on voting behavior influenced the development of research on environmental voting behavior?
Growth of scholarly interest over time	How has the volume and nature of research on environmental voting behavior evolved over time?
Prominent sources, contributors, and cited references	What are the key sources, authors, and references contributing to the field of environmental voting behavior research?
Geographical distribution	How do geographical and cultural factors influence environmental voting behavior across different countries and regions?
Thematic landscape and gaps	What are the dominant themes in the literature on environmental voting behavior, and which specific issues remain underexplored?

2. Method

A domain-centric approach and an investigation of knowledge structures are two fundamental components of bibliometric analysis undertaken as part of a comprehensive literature review examining the impact of environmentalism on voting behavior research. The former component is strongly grounded in quantitative measures and encompasses four levels: analysis based on sources, evaluation based on authors, and a thorough examination based on documents. The latter component investigates the complexities of knowledge structures, such as the conceptual framework, which elucidates the essential themes of research literature in a more qualitative manner, and the intellectual landscape, which delineates the relationships between different research fields (Özdil & Konuralp, 2024). Given the constraints of this study, our analysis focused solely on the domain-centric components. Subsequent studies should explore the conceptual and thematic evolution of this field more extensively.

Data for this study were compiled using *Bibliometirx*, an R-based bibliometric analysis package (Aria & Cuccurullo, 2017), by conducting a WoS topic search (TS) using the following terms: (ecologism OR environmental* OR climate+change OR climate+crisis) AND (voting+behavior OR

election+behavior OR elections). *Bibliometrix* provides comprehensive descriptive statistics on publication trends, including journal metrics, geographical distribution, international collaboration, authorship, articles, references, and citations.

Furthermore, a bibliographic coupling analysis of articles based on shared references facilitated their categorization. Articles within the clusters generated from the bibliographic coupling analysis were examined and pertinent themes were identified. This identification does not constitute a thorough qualitative analysis but rather offers a general overview of the essential themes, establishing a foundation for subsequent detailed research. Before discussing our statistical indicators, it is pertinent to review the primary literature on voter behavior to elucidate the trajectory that leads to the evolution of a specific domain, namely, environmental voter behavior.

3. Early Sources of Studying Voting Behavior

The study of electoral behavior began to take shape in the mid-twentieth century, with pioneering contributions from several schools of thought that focused on various aspects influencing voter behavior. If we enumerate the early studies of voter behavior chronologically, the Columbia School, Michigan School, and Rational Choice Theory would follow. These schools have shaped our knowledge of how social structures, psychological ties, rational decision-making, and retrospective appraisals influence voter behavior, paving the way for further research and new schools of thought. We briefly review the primary contributions of early studies on voter behavior, including their methods, findings, and long-term impacts on political science, and provide an overview of the source from which environmental voter behavior research arose in the 1990s.

First, the Columbia School, widely recognized as a sociological approach, pioneered the study of voting behavior through a sociological lens by emphasizing the importance of social context and group associations in two volumes: *The People's Choice* (Lazarsfeld et al., 1944) and *Voting* (Berelson et al., 1954). In *The People's Choice*, Lazarsfeld et al. (1944) conducted one of the first systematic studies on voting behavior in the 1940 US presidential election, employing a panel study design in which the same voters were interviewed several times during the campaign. Their main findings revealed the importance of social group affiliations, such as class, religion, and community, in shaping voter preferences while also developing the concept of cross-pressure, which states that people from opposing social groups are more likely to change their voting preferences during a campaign. Columbia researchers also made a key finding about the media's limited influence: contrary to the assumption that the media has a direct effect on voter preferences, they discovered that the media primarily reinforces existing opinions rather than changing them. This resulted in the development of a two-step communication flow model, in which information from the media was filtered through opinion leaders before reaching wider social networks.

In *Voting* (Berelson et al., 1954), Columbia researchers extended their previous findings to strengthen the notion that social traits such as class, religion, and occupation play a substantial role in voting behavior. They contended that most voters are not profoundly immersed in political topics and instead base their selections on habitual behavior and social cues. This study, which discussed the concept of political apathy, found that political engagement is low, and voters frequently follow the voting patterns of their social groupings rather than making informed, autonomous decisions.

The Columbia School's use of empirical and panel data analysis represents a significant methodological advancement. However, the school has been chastised for underestimating the value of individual cognition and psychological ties, which subsequent researchers have addressed. Despite these criticisms, the Columbia School's emphasis on social influence remains relevant in studies of community-based voting and the impact of social networks on electoral behavior.

Second, the Michigan School focuses on individual attitudes, beliefs, and emotional attachments to political parties and presents a psychological model of electoral behavior. The most influential work in this school is *The American Voter*, written by Angus Campbell, Philip Converse, Warren Miller, and Donald Stokes(1969). They asserted that party identification is a deep-rooted psychological attachment that affects voting decisions in the long term. This study is based on the

finding that voters are largely stable in their political preferences; most become affiliated with a political party early in their lives and remain loyal to this attachment in most elections. According to the funnel of causality concept developed to explain voting behavior, long-term factors such as party identification are the most stable and effective determinants, whereas short-term factors such as charismatic candidates, periodic problems, and economic conditions play a smaller role.

In another pioneering study that adopted this model, *Political Change in Britain*, David Butler and Donald Stokes (1969) found that like their American counterparts, British voters were heavily influenced by party identification; however, they also observed that the beginnings of partisan dealignment as traditional party loyalties began to weaken, particularly along class lines. Butler and Stokes argued that voters were becoming more volatile, with short-term influences, such as leadership evaluations and economic conditions, playing a more prominent role. Therefore, critics have criticized the Michigan Model for overestimating the stability of party identification and underestimating the importance of short-term factors, particularly in the context of increased electoral volatility. Later work has shown an increasing partisan dealignment and a greater role for issue-based voting.

Third, in Rational Choice Theory, drawing upon the self-interest axiom in his economic theory of political behavior, Anthony Downs (1957a) posits that rationality guides utility-seeking individuals to choose between vote-maximizing parties, which are groups of individuals seeking to gain control of the governing system by obtaining a majority in a properly organized election. However, Downs contends that traditional economic theory does not sufficiently integrate government as a decision-making entity, so he argues for the need to bridge political theory with economic theory. Governments have traditionally been regarded as external entities, whose behaviors are influenced by political agendas rather than economic factors. This approach is insufficient because government decisions, such as economic decisions, are driven by self-interest rather than by optimizing society's welfare. For this reason, he proposed combining the two theories by analyzing government decision-making through the lens of economic behavior.

Whereas Downs' theory suggests that voters are prospective, making decisions based on their expectations about future benefits rather than past performance, later studies emphasized the concept of retrospective voting, in which voters evaluate past performance (particularly that of incumbents) rather than making complex calculations about future outcomes. For example, Valdimer Orlando Key's (1966) *The Responsible Electorate* introduced the concept of retrospective voting, which was further developed by Morris Fiorina. Key maintained that, especially regarding economic results, citizens are reasonable assessors of government performance. Unlike the Michigan School, referring to long-term psychological attachments, Key suggested that voters base their decisions on government performance; voters are more likely to re-elect incumbents if the economy is doing well, and if the economy is doing poorly, they are more likely to vote for the opposition. In this respect, particularly in times of economic crisis, the idea of retroactive voting has become fundamental to understanding voter behavior.

Fiorina's (1981) book, *Retrospective Voting in American National Elections* reveals that the impact of future expectations outweighs that of past assessments, although this process follows a predictable development sequence. Directly experienced or observed events and conditions have an immediate impact on the performance evaluations that define future expectations. Prior party identification serves as a mediator in both phases but also includes retrospective assessments of past timeframes. Future expectations are empirically significant, because they represent the culmination of a voter's long-term assessment and experience.

Finally, while it does not belong to the traditional research families on voting behavior, such as Columbia, Michigan, and Rational Choice schools, Ronald Inglehart's (1977) work *Silent Revolution* deserves mention among the foundational analyses, particularly in terms of providing a theoretical basis for environmental voting behavior research and addressing changes in voting behavior from the perspective of political culture and value change. In contrast to the theories of political sociologists Lipset and Rokkan (1967), who historicize but simultaneously freeze party systems by attributing their origins to cleavages between center and periphery, state and church throughout nation-building, and

rural and urban workers and employers subsequent to the Industrial Revolution, politics that draw attention to environmental degradation reflect new divisions. Inglehart incorporated the theoretical framework of post-materialism, which has greatly influenced the comprehension of enduring cultural and generational shifts in politics. In other words, by complementing established models such as Columbia, Michigan, and Rational Choice schools, Inglehart's approach has made a crucial contribution to the examination of value shifts and their impact on voting behavior. Hence, his theory, which focuses on postmaterialist principles, has had a significant impact on elucidating the emergence of new social movements and the Greens in Europe as well as the wider restructuring of party systems in advanced democracies. Furthermore, he makes valuable contributions to continuous discussions on the diminishing influence of class-based voting and the growing significance of issue-based politics. He posits that in conjunction with systemic transformations, such as economic and technological progress, individual-level changes in values and skills result in systemic outcomes, such as the reduction of class conflict and material concerns, and the emergence of elite-challenging movements that address specific issues.

Building on these theoretical foundations, this study empirically explores how these frameworks manifest in the context of environmental voting behavior. The following section presents an analysis of publication trends in this field, which sheds light on the evolution and scope of research on environmental voting behavior over the years.

4. Findings and Discussion

Theoretical approaches to voting behavior allow us to elaborate on how they are transposed into lenses that investigate environmental politics by contextualizing and interpreting the findings of our bibliometric analysis. This section presents the assessments of metric indicators across the source, author, and document levels along with the themes identified from the clustering of articles within our collection.
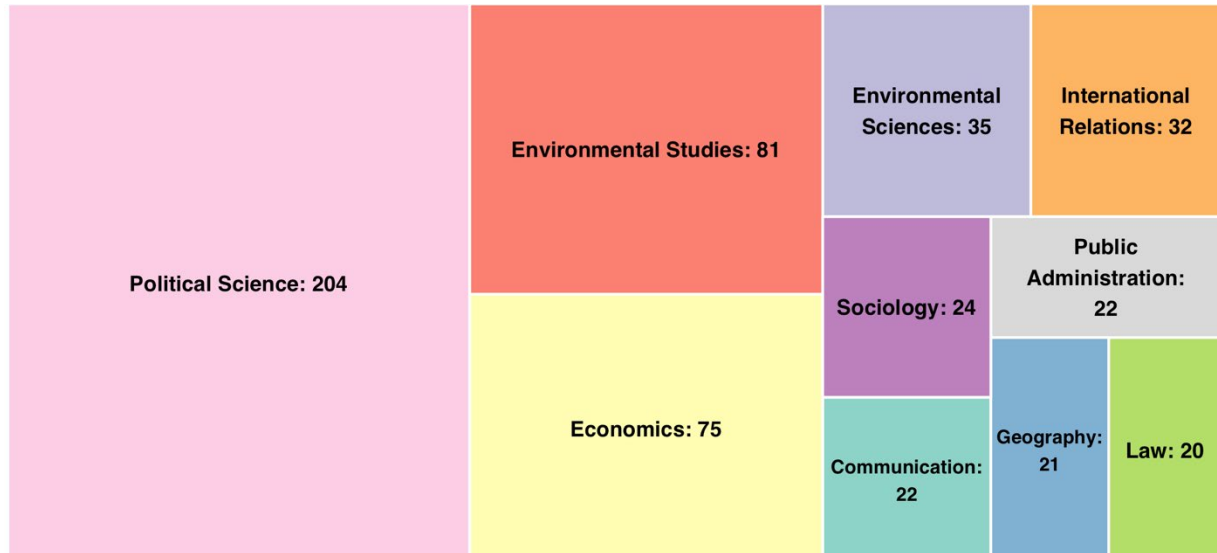
To begin with a general description of our dataset, Table 2 demonstrates that between 1991 and 2024, 535 articles written by 1151 authors were published in 341 journals. The fact that 35% of the papers were written by a single author indicates that authors in this discipline frequently collaborate. Additionally, the rate of international collaboration was approximately 24%, indicating a reasonable level of international collaboration.

Table 2. Overview of the collection

Description	Results
Main Information About Data	
Timespan	1991:2024
Journals	341
Articles	535
Annual Growth Rate %	10,86
Article Average Age	7,22
Average Citations per Article	15,91
References	26665
Article Contents	
Keywords Plus (ID)	1192
Author's Keywords (DE)	1596
Authors	
Authors	1151
Authors of Single-authored Articles	177
Authors Collaboration	
Single-authored Articles	186
Co-Authors per Article	2,29
International Co-authorships %	23,74

Political Science accounted for most articles included in the dataset, with 204 articles comprising 38% of the sample. Environmental Studies (81) is the second-largest WoS category, followed by Economics (75). The global climate crisis necessitates international cooperation and legislation. Additionally, sociological research aids in understanding behavioral patterns. Therefore, International Relations (35) and Sociology (24) provide the theoretical and methodological background for studying environmentalist voting behavior. However, the weights of these two disciplines in the sample are minimal (Figure 1).

Figure 1. First 10 WoS categories

Figure 2 displays the number of articles published each year (depicted by bars) and their corresponding citation counts (depicted by the line) from 1991 to 2024. The graph illustrates significant fluctuations in citations over the years, with pronounced peaks particularly in 1992, 1997, 2003, 2006, 2008, 2012, and 2017. However, the number of articles published shows a consistent upward trend, particularly noticeable from 2013 onwards, reaching the highest levels in 2023 and 2024. The data highlight a growing research output in recent years, although citation numbers show a more variable pattern with recent declines, possibly indicating a time lag in citations catching up with the increased article production.

The peak in 1992 corresponds to Huckfeldt and Sprague's (1992) article, which has garnered 293 citations. With 139 citations, "Studying Courts Comparatively: The View from the American States" by Brace and Hall (1995), with 327 citations, "Environmental Regulation, Ideology, and the D. C. Circuit" by Revesz(1997), with 54 citations, "Voting preferences and the environment in the American electorate" by Guber (2001), with 422 citations, "Unraveling the Effects of the Internet on Political Participation?" (Tolbert & Mcneal, 2003), with 271 citations, with 248 citations, "Elections matter: Theory and evidence from environmental policy'" (List & Sturm, 2006), "Genetic Variation in Political Participation" (Fowler et al., 2008), with 316 citations, "On the economics of energy labels in the housing market" (Brounen & Kok, 2011), with 254 citations, "Niche Party Success and Mainstream Party Policy Shifts – How Green and Radical Right Parties Differ in Their Impact" (Abou-Chadi, 2016) are the studies that significantly contributed to the peak points of their year of publication.
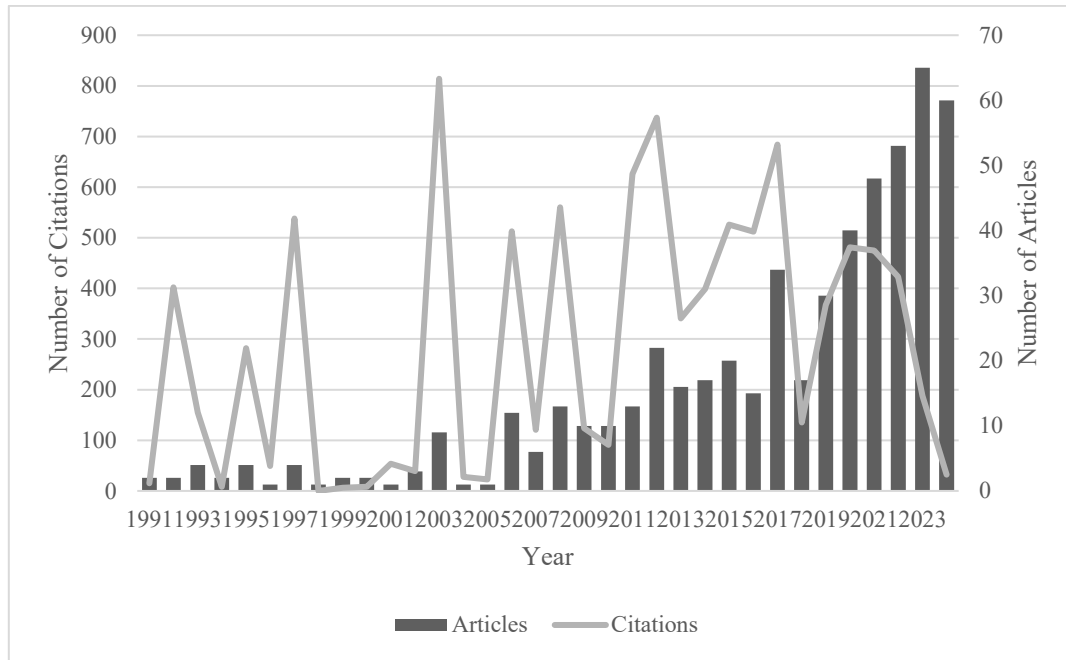
Figure 2. Trends in published articles and citations over time (1991-2024)

4.1. Source-level Dynamics

As depicted in Figure 3, the most relevant journals in the field, based on the number of publications, included *Electoral Studies*, *Environmental Politics*, and *Review of Policy Research*, each with nine articles. *Social Science Quarterly* closely followed eight publications. Other significant journals include the *European Journal of Political Research*, *Journal of Environmental Economics and Management*, and *Journal of Politics*, each contributing seven articles to the body of research. Additionally, the *Australian Journal of Political Science*, *Energy Policy*, *Mirovaya Ekonomika, Mezhdunarodnye Otnosheniya*, and *Political Research Quarterly* published six articles. Finally, the *Asian Survey*, *Contemporary Europe-Sovremennaya Evropa*, and *Journal of the Association of Environmental and Resource Economists* each have five articles, demonstrating their relevance and impact within the research community. This distribution indicates a broad interest in political science and environmental policies across various specialized journals.
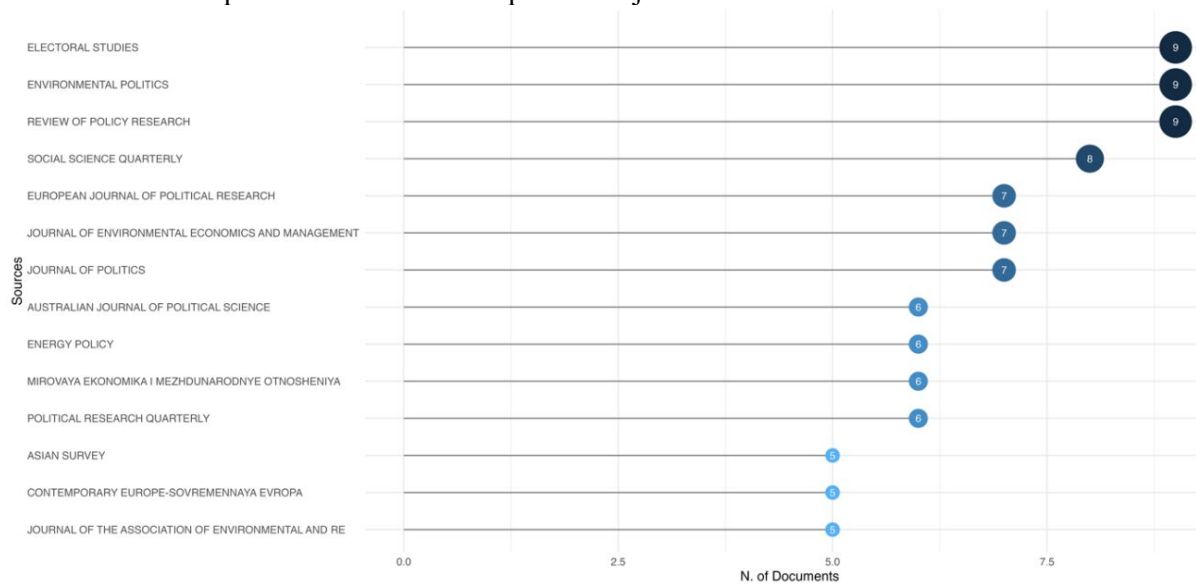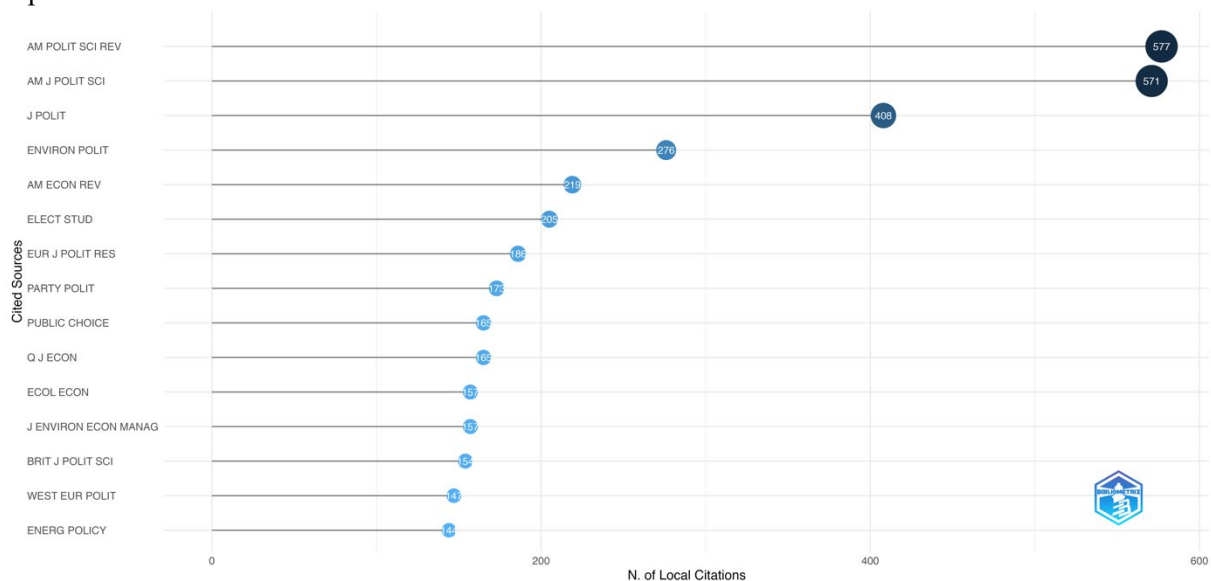

Figure 3. Most relevant journals

Figure 4 presents the data for the most frequently cited journals within the local context. The top journals, based on the number of citations received by the articles in our data collection, included the *American Political Science Review* (577 citations), closely followed by the *American Journal of Political Science* (571 citations). The *Journal of Politics* also ranked highly with 408 citations. *Environmental Politics* and *American Economic Review* are noteworthy, with 276 and 219 citations, respectively, indicating their substantial impact on both political and economic domains. *Electoral Studies* has 205 citations, underscoring its significance in research related to elections and voting behavior. The *European Journal of Political Research* has received 186 citations. *Party Politics* and *Public Choice* were both influential, with 173 and 165 citations, respectively, demonstrating their relevance in the study of political parties and the application of economics to political decision making. Within our dataset, the *Quarterly Journal of Economics* has 165 citations and has the highest Impact Factor (11.1) among the most referenced journals. *Ecological Economics* has 157 citations, analyzing the interrelationships between ecosystems and the economy. Similarly, the *Journal of Environmental Economics and Management*, with 157 citations, has highlighted the increasing focus on environmental issues in economic research. The *British Journal of Political Science* and *West European Politics* were also key contributors, with 154 and 147 citations, respectively. Finally, *Energy Policy*, with 144 citations and a considerably high Impact Factor (9.3), indicates its significance in the intersection of energy issues and policymaking. This distribution of citations among journals suggests a pronounced emphasis on political science, economics, and environmental issues, reflecting the multidisciplinary nature of the topic.

Figure 4. Most local cited journals

According to Bradford's law, the core journals encompass a broad range of highly influential publications in political science and environmental policy: *Electoral Studies, Environmental Politics, Review of Policy Research, Social Science Quarterly, European Journal of Political Research, Journal of Environmental Economics and Management, and Journal of Politics. Core journals include the Australian Journal of Political Science, Energy Policy, Mirovaya Ekonomika i Mezhdunarodnye Otnosheniya, Political Research Quarterly, Asian Survey, Contemporary Europe-Sovremennaya Evropa, Journal of the Association of Environmental and Resource Economists, American Journal of Political Science, American Political Science Review, British Journal of Political Science, Ecological Economics, Environmental and Resource Economics, European Union Politics, Journal of Public*

*Economics, Party Politics, Political Behavior, Political Geography, Political Science Research and Methods, Politics & Policy, Public Choice, Regional and Federal Studies, Society & Natural Resources, West European Politics, ATW-International Journal for Nuclear Power, Comparative Political Studies, Energies, Environmental Policy and Governanc*e, and *Frontiers in Psychology*. These core journals studying environmentalist voting behavior are instrumental in advancing research across diverse subfields.

Figure 5 illustrates the local impact of journals in our dataset as measured by the H-index, which reflects both the productivity and citation impact of publications within those journals. *Environmental Politics* and *Review of Policy Research* are shown to have the highest local impact, each with an H-index of 6, indicating their significant influence in the field. Following closely are *Electoral Studies*, *Energy Policy*, *Journal of Environmental Economics and Management*, and *Social Science Quarterly*, with an H-index of 5. Journals such as the *American Journal of Political Science*, *American Political Science Review*, *Australian Journal of Political Science*, *Ecological Economics*, *Journal of Politics*, *Political Geography*, *Political Research Quarterly*, *Society and Natural Resources*, and *West European Politics* each had an H-index of 4.
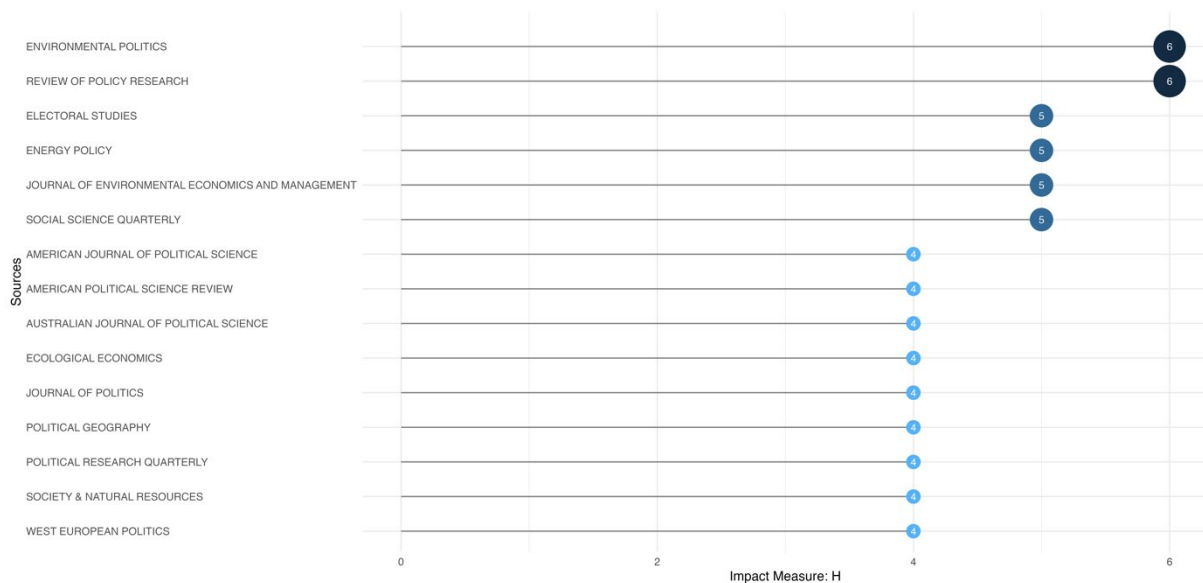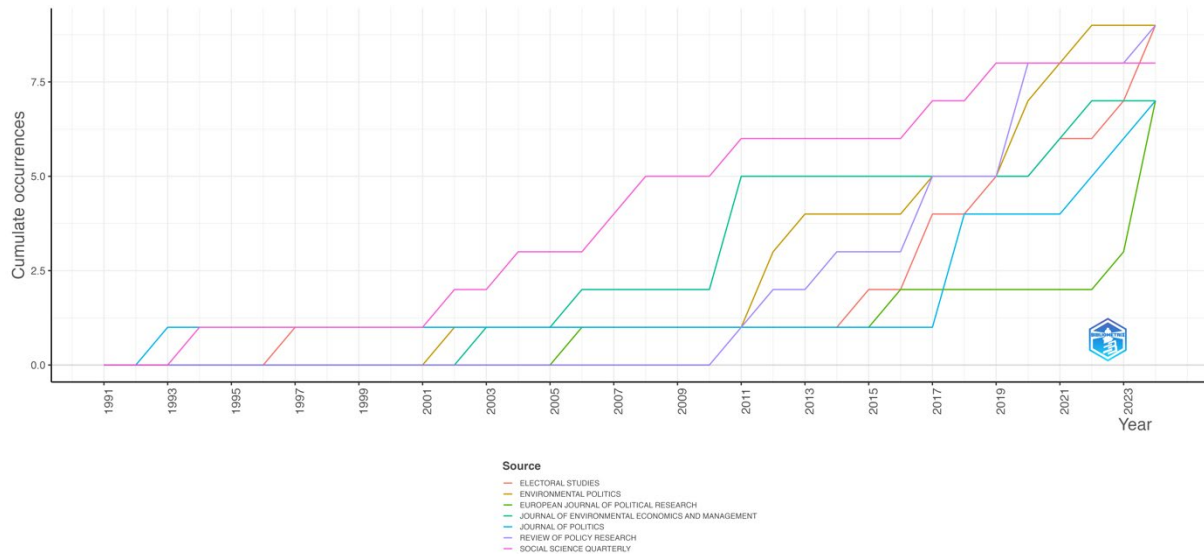

Figure 5. Local impact of journals by H-index

Figure 6 illustrates the cumulative production of the most impactful journals over time, and shows how their contributions have grown since 1991. The lines with distinctive colors represent different journals and increase their publication numbers. *Environmental Politics* and *Social Science Quarterly* displayed a consistent increase in production, with Environmental Politics showing a particularly steep rise from around 2009 onwards, indicating its growing prominence in the field. The *Review of Policy Research* and *Electoral Studies* also shows significant growth, particularly after 2010, suggesting that these journals have become more active and influential in recent years.
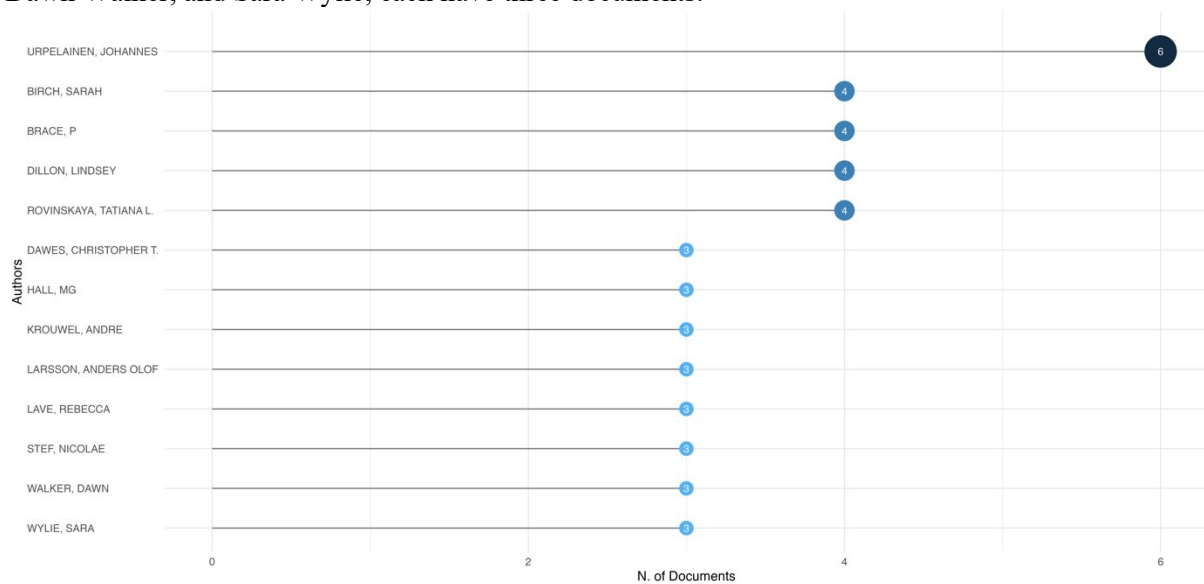
Figure 6. Production of journals over time

4.2. Author-level Metrics

Figure 7 highlights the most relevant authors in the field, based on the number of articles published. Johannes Urpelainen stands out as the most prolific author, with six articles in his name, indicating his significant contribution to the research landscape. Following him are several authors, each with four documents: Sarah Birch, P. Brace, Lindsey Dillon, and Tatiana L. Rovinskaya. These authors are recognized for their substantial involvement in this field. In addition, a group of authors, including Christopher T. Dawes, M.G. Hall, Andre Krouwel, Anders Olof Larsson, Rebecca Lave, Nicolae Stef, Dawn Walker, and Sara Wylie, each have three documents.

Figure 7. Most productive authors

Figure 8 shows the most locally cited authors based on the number of citations they received from the articles included in our dataset. This chart conveys their notable influence on studies addressing environmental voting behavior. With 21 local citations, John A. List, an economist well-known for his work in experimental and behavioral economics, and Daniel M. Sturm, an economist specializing in urban economics and political economy, are the most frequently cited authors thanks to their co-authored work.

Tarik Abou-Chadi, a political scientist focusing on political behavior and electoral politics, followed 17 citations, underscoring his substantial influence on understanding voter behavior and party systems. Grant, a noted political scientist with expertise in electoral behavior and political psychology, and James Tilley, renowned for his study of the convergence of public opinion, social identity, and politics, received 10 citations for their collaborative research.

Political scientists Johannes Urpelainen and Wolfgang Rüdig, who conducted research on environmental politics and movements, received nine and eight citations, respectively. Louis-Philippe Beland, an economist whose research covers labor economics and education policy, M.E. Kahn, an economist specializing in environmental and urban economics, John G. Matsusaka, a political economist with expertise in direct democracy, and Vincent Boucher, known for his work on social networks and political behavior, have seven citations each. Political Scientists Leonardo Baccini, D.L. Guber, and Lucas Leemann focused on international political economy, environmental politics, and political representation; economists Per G. Fredriksson, Khawaja A. Mamun, and Le Wang studied environmental economics, developmental economics, and labor economics, respectively. All received six citations in their work.
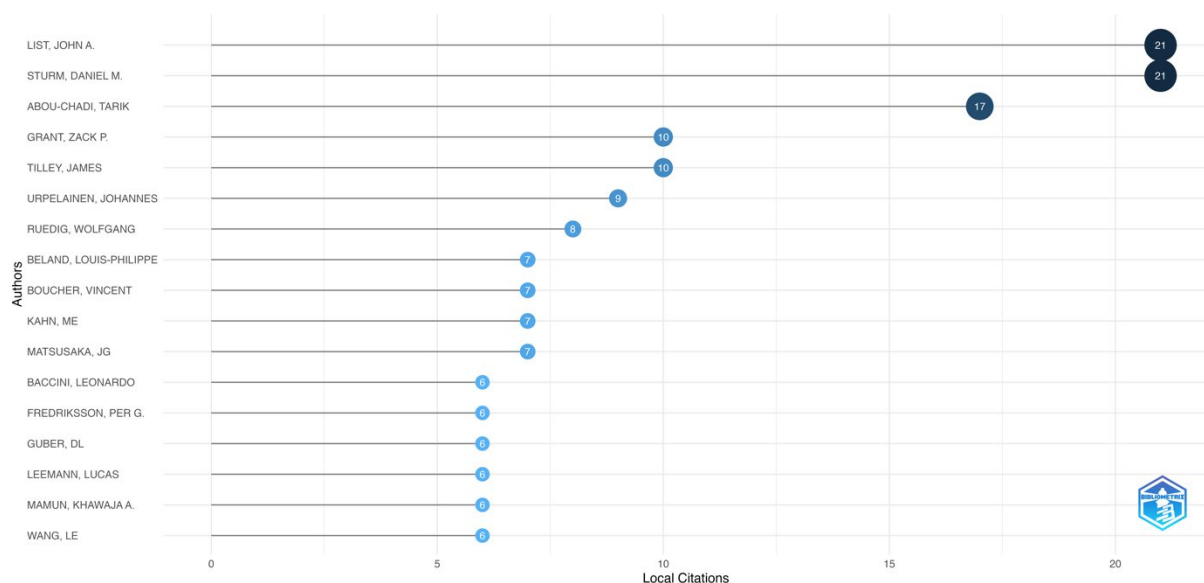

Figure 8. Most local cited authors

The authors' productivity over time, as illustrated in Figure 9, indicates that Urpelainen is a prolific scholar, with numerous publications from 2012 to 2022. His research encompasses various topics, including electoral backlash, policy responsiveness, and the polarization of American environmental politics. His co-authored publications, particularly in *the Journal of Politics* and *Review of Policy Research*, accrued a substantial number of citations, demonstrating his influence on environmental policy analysis (Cooper et al., 2018; Kim & Urpelainen, 2017). UK-based political scientist Sarah Birch made significant contributions to the topic by conducting research that specifically examined the association between democracy and environmental attitudes. Significantly, her research published in *Environmental Politics* on polarization along environmental issues received a substantial number of citations (Birch, 2020).

In collaboration with Rebecca Lave, Sara Wylie, and Dawn Walker, Lindsey Dillon investigated environmental data during the Trump administration, while Rovinskaya explored the Green Movement in the context of the US and Europe with her articles published in *Mirovaya Ekonomika i Mezhdunarodnye Otnosheniya*. Dawes authored publications on inherent genetic factors that influence political behavior. Specifically, his co-authored piece, published in the *American Political Science Review*, received 230 citations (Fowler et al., 2008).

Dutch political scientist Andre Krouwel examined the intersection between environmental policy and European integration, whereas Larsson's recent work on digital politics investigated the role of social media in shaping political discourse. Additionally, Stef shifted his focus to environmental quality and legislation. Political scientist Tarik Abou-Chadi made substantial contributions to the theory of political rivalry and voter behavior in European settings, particularly regarding niche parties, while sociologist Kerry Ard focused on environmental policymaking and voting.
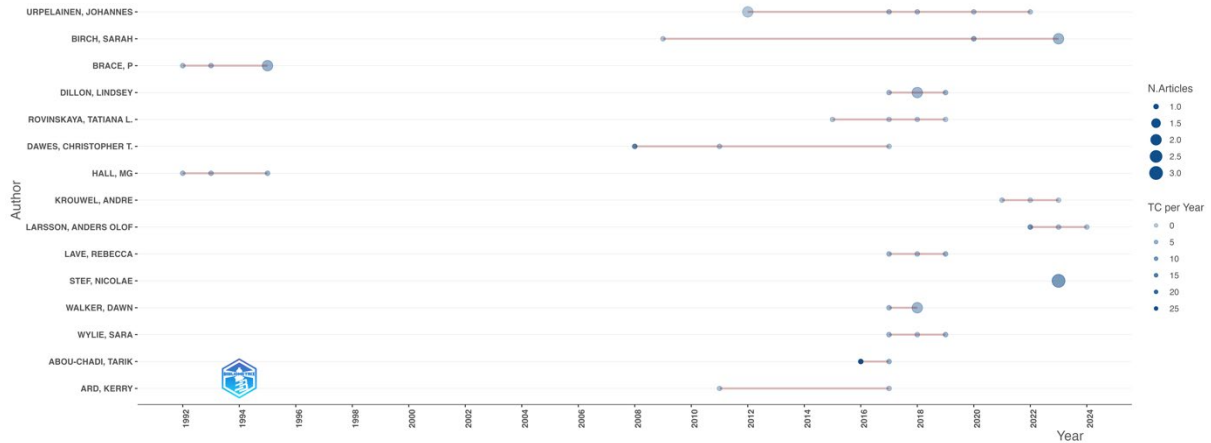

Figure 9. Authors' production over time

Figure 10 applies Lotka's law to analyze author productivity within our dataset. Accordingly, we observed that most authors contributed a small number of articles, while a few authors produced many studies. The vast majority of authors (approximately 95.5%) contributed only to a single document. This is consistent with Lotka's law, where most researchers in the field make a single contribution to the literature. A small proportion of the authors (approximately 3.4%) published two documents. This sharp drop was typical of the Lotka distribution. The number of authors contributing to the three documents decreased by approximately 0.7%. The percentage of authors who published four or more documents decreased significantly, with only 0.3% of authors having published four or fewer documents. This distribution emphasizes that while many scholars contribute to the literature on environmentalism and voting behavior, only a small number of highly productive authors dominate the field.
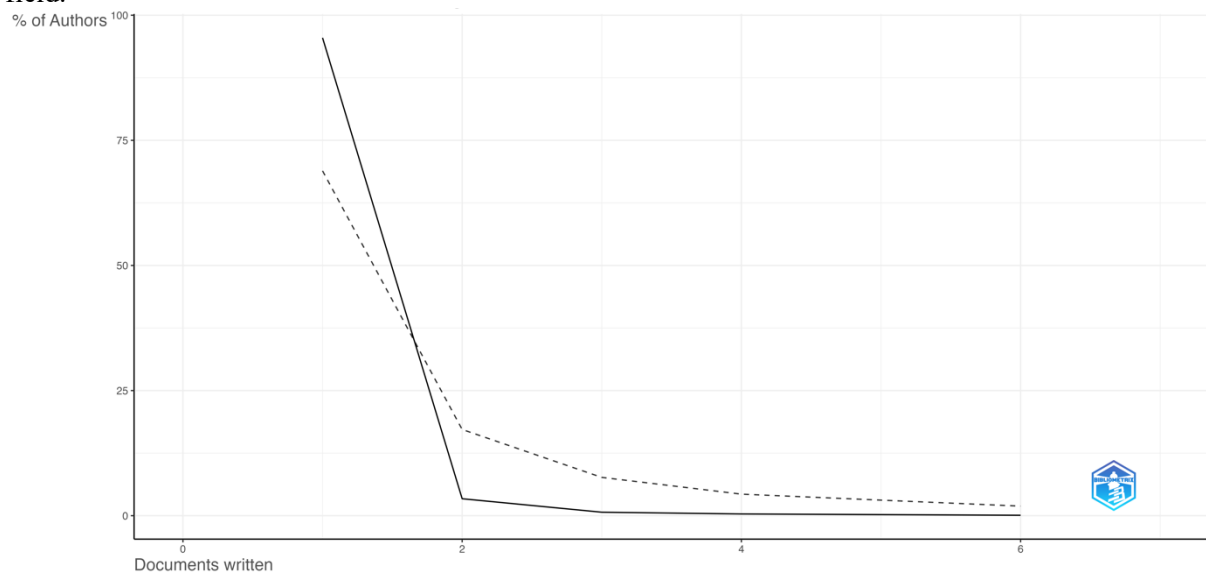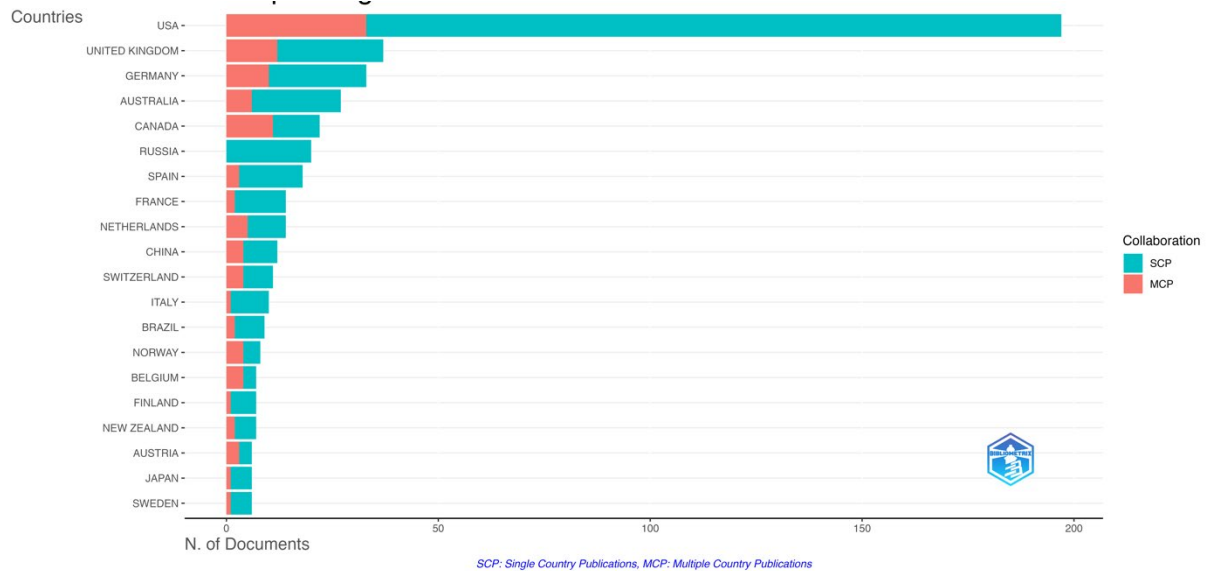

Figure 10. Author productivity through Lotka's law

Figure 11 provides insights into the countries of the corresponding authors in the field of environmentalism and voting behavior, with a particular focus on the collaboration patterns indicated by single-country publications (SCP) and multiple-country publications (MCP). The United States led significantly, with 197 articles, accounting for 36.8% of the total publications. Of these, 164 were SCPs, indicating strong domestic research output, while 33 were MCPs, showing some level of international collaboration (16.8% of the US publications involved multiple countries). The UK followed 37 articles, accounting for 6.9% of the total. Notably, 32.4% of these articles were the result of international collaboration (MCP), highlighting the UK's active participation in cross-border research.

Figure 11. Corresponding authors' countries

The predominant influence of the American academic community on environmental voter behavior and voting behavior in general can be attributed to the development of a positivist school within this context. Behavioralism, which emphasizes the empirical study of political behavior rather than institutions or normative theory, emerged and developed primarily within American political science in the mid-20th century. This approach has significantly shaped the discipline, particularly in the United States, where it continues to dominate political science research. This paradigm prioritizes the supremacy of empiricist epistemology in the pursuit of quantifying political behavior. The Chicago, Michigan, and Rational Choice schools were all influenced by behavioralism, which informed their methodologies for researching voting behavior by emphasizing systematic analysis and empirical data. Figure 12 corroborates that, in nations with weak or nonexistent democratic processes, the relationship between environmental concerns and voting behavior may not be a priority for researchers and policymakers. In the absence of robust democratic institutions, the mechanisms that link public opinion and electoral behavior to environmental policy may be underdeveloped or irrelevant.

Figure 13 shows the production of scientific articles over time from five key countries—Australia, Canada, Germany, the United Kingdom, and the United States—in the fields of environmentalism and voting behavior. The United States (represented by the pink line) showed a sharp and significant increase in the number of publications, particularly after 2016. The country has a wide margin, with its publication count surpassing 400 by 2023. Other countries exhibit modest but steady increases in publication output. Their lines remained relatively close to each other, with a noticeable rise beginning around 2015, but none reached the levels seen in the United States.
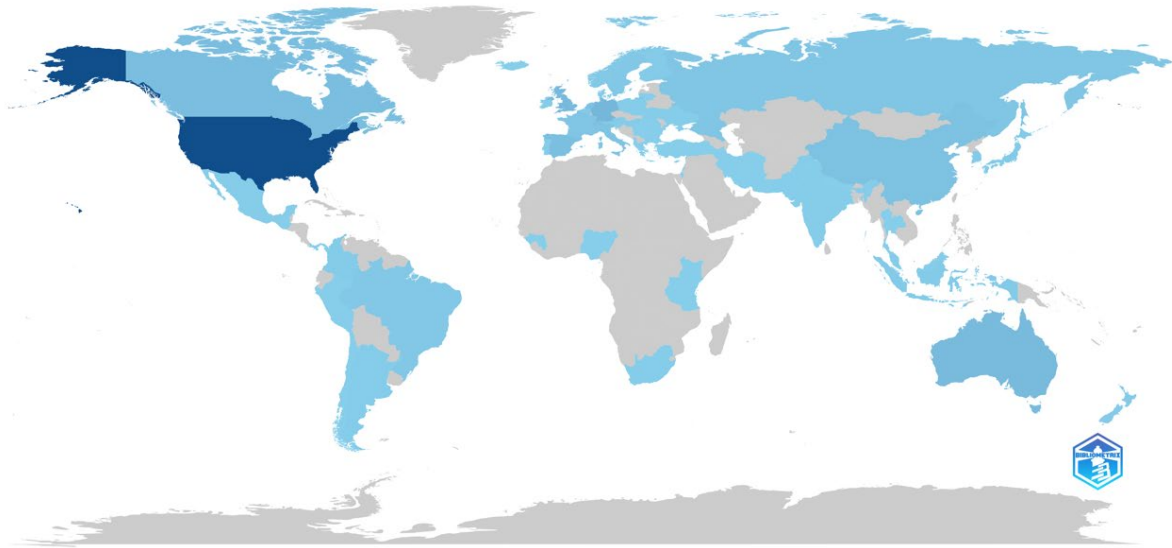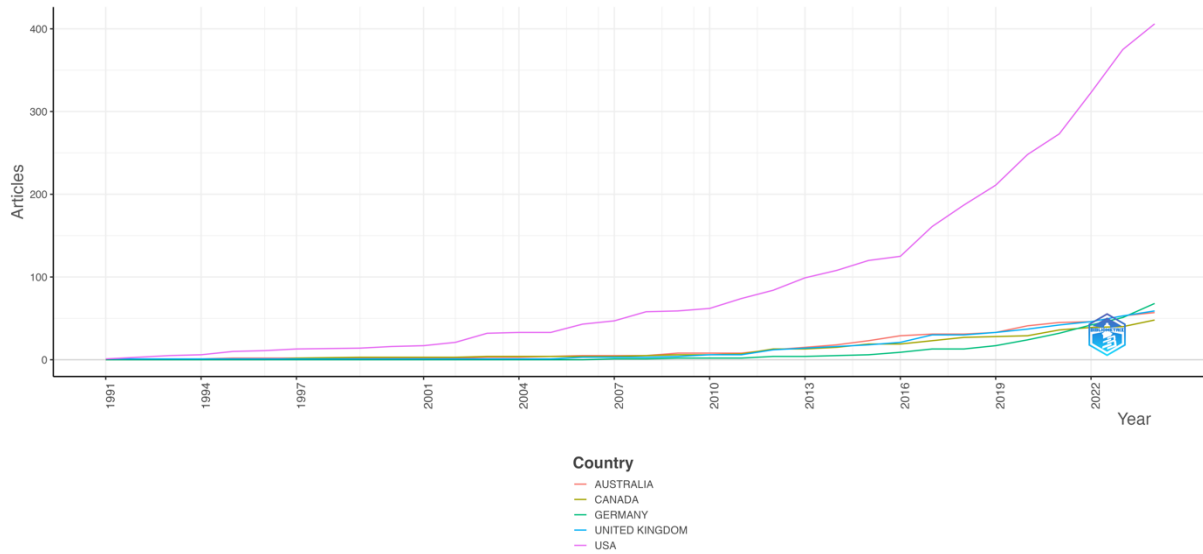
Figure 12. Country-based scientific production

The factors contributing to the sharp increase in US publications on environmentalism and voting behavior after 2016 can be categorized as political context; increased public awareness and activism; funding and institutional support; and technological and methodological advances. First, the 2016 US presidential election and the subsequent political environment brought environmental issues to the forefront of national discourse. As noted by David Friedland (2016), the election of President Donald Trump, who frequently questioned the science of climate change and rolled back numerous environmental regulations, likely galvanized both public and academic interest in environmental policies and their political implications. The polarization around environmental issues, such as climate change and the US withdrawal from the Paris Agreement, has spurred a significant amount of research focused on understanding the electoral impacts of environmentalism and how these issues influence voting behavior. The findings in *Global Warming and the US Presidential Election* report confirmed polarization on environmental issues: while more than 90% of Democrats believe global warming is real, only half of Republicans do (Leiserowitz et al., 2016, p. 4).

Second, during this period, environmental movements, especially young-led projects such as the Global Climate Strike, motivated by leaders such as Greta Thunberg, gained tremendous momentum. The growing public awareness of the degradation of the environment and climate change has translated into more scholarly studies looking at the junction of these problems with political behavior. The Green New Deal and other policy ideas connected directly to environmental issues have encouraged research into how these programs have changed voters' choices and electoral results (Jung et al., 2020; Sabherwal et al., 2021).

Third, in response to the growing urgency of environmental issues, funding opportunities for research in this area have increased, particularly for institutions and foundations concerned with sustainability and policy recommendations (Sahle et al., 2024; Vega, 2023; Woolston, 2023).

Finally, in recent years, significant advances in data collection, analysis techniques, and computer tools, all of which are essential to behavioralism, have allowed researchers to investigate complex issues more effectively, such as the relationship between environmental concerns and voting behavior (Gohil et al., 2021; Zhang et al., 2024).

Figure 13. Country production over time

4.3. Document-level Indicators

The most globally cited articles in this collection reflect a diverse range of influential research at the intersection of environmental issues, political behavior, and public policy. In terms of average annual citations, only Abou-Chadi's (2016) article, which provides empirical evidence that niche parties, specifically green and radical right parties in Europe, have varying effects on mainstream party behavior, stands out as a relatively recent publication, with more than 225 citations.

Tolbert and McNeal's (2003) research on the Internet's beneficial influence on political engagement examined socioeconomic status, partisan affiliation, attitudes, conventional media exposure, and state environmental variables. Brounen and Kok (2011) observed that there is a positive correlation between the percentage of "green" voters and the geographical variation in the rate of energy label adoption, while Revesz (1997) examined the relationship between Democrat or Republican judges' ideological leanings and their decisions when an environmentalist group challenges regulation.

Fowler et al. (2008) introduced a groundbreaking biological perspective on political participation in which the human propensity to engage in political activities is genetically variable. Huckfeldt and Sprague (1992) posited that environmental conditions determine the parameters that govern interactions between political parties and voters, thereby influencing the effectiveness of partisan mobilization. List and Sturm (2006) argued that when faced with political rivalry, politicians appear to find it more expedient to address secondary programs, such as environmental concerns, which constitute a small fraction of state expenditure, while Kahn and Matsusaka (1997) analyzed voter preferences for environmental goods through California's voting patterns, highlighting the intersection of environmental economics and political behavior.

Theisen's (2012) study on climate variability and conflict in Kenya, Kallbekken et al.'s (2011) investigation of tax aversion, Harrison's (2012) examination of environmental tax reform in Canada, Carattini et al.'s (2017) discussion of green taxes in the post-Paris world, and Swyngedouw's (2013) analysis of desalination projects in Spain further enrich the discourse on environmental governance, taxation, and the sociopolitical challenges of implementing sustainable policies (Table 3).

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Table 3. Most global cited articles

Title	Authors & Year	GC
Unraveling the Effects of the Internet on Political Participation?	(Tolbert & Mcneal, 2003)	308
On the economics of energy labels in the housing market	(Brounen & Kok, 2011)	297
Environmental Regulation, Ideology, and the D. C. Circuit	(Revesz, 1997)	295
Genetic Variation in Political Participation	(Fowler et al., 2008)	230
Political Parties and Electoral Mobilization	(Huckfeldt & Sprague, 1992)	228
Niche Party Success and Mainstream Party Policy Shifts	(Abou-Chadi, 2016)	225
Elections matter: Theory and evidence from environmental policy	(List & Sturm, 2006)	212
Demand for environmental goods: Evidence from voting patterns on California initiatives	(Kahn & Matsusaka, 1997)	145
Climate clashes? Weather variability, land pressure, and organized violence in Kenya, 1989-2004	(Theisen, 2012)	135
Do you not like Pigou, or do you not understand him? Tax aversion and revenue recycling in the lab	(Kallbekken et al., 2011)	130
A Tale of Two Taxes: The Fate of Environmental Tax Reform in Canada	(Harrison, 2012)	116
Green Taxes in a Post-Paris World: Are Millions of Nays Inevitable?	(Carattini et al., 2017)	113
Into the Sea: Desalination as Hydro-Social Fix in Spain	(Swyngedouw, 2013)	112

GC: Global Citations

As shown in Table 4, the most locally cited articles in our dataset provided critical insights into the intersection of environmentalism and voting behavior, reflecting their foundational importance within this specific research context. While Abou-Chadi (2016), List and Sturm (2006), and Kahn and Matsusaka's (1997) works are also in the list of the most globally cited articles (Table 3), Grant and Tilley's (2019) influential study analyzes Green Party success by comparing outcomes in different circumstances. This study showed that voter desires, institutional barriers, and mainstream party tactics affect environmentalist votes. Green parties thrive in postmaterialist cultures with great affluence or environmental conflicts. Although election systems have a minimal effect on Green Party vote share, regional decentralization favors them. The most surprising outcome of this study is that mainstream party strategy affects environmental vote potential, depending on the age of the Green Party. Embracing environmental topics weakens fledgling green parties, but surviving elections reverses this impact. Mainstream party policies that accommodate environmental sensitivity increase green votes by increasing core environmental concerns.

Rüdig's (2012) study "The Perennial Success of the German Greens" has the highest local-to-global citation ratio (31%) among the most locally cited articles. This suggests that this study has considerable influence on the narrow topic of environmental voting behavior and is particularly relevant; however, its influence outside this niche is limited. In this article, Rüdig (2012) argues that they remain primarily focused on environmental issues, with a strong stance against nuclear power. Although the party's support base has increasingly included women and older individuals, its core still consists of those from the 1968 generation and new social movements. Similarly, Schumacher (2014) empirically examined the factors influencing individuals' green voting behavior. The most significant determinants were voters' attitudes towards, or proximity to, nuclear sites, educational attainment, and net income. These findings indicate that individuals with alternative worldviews or dissenting attitudes are more likely to vote for the Green Party, reflecting its historical role as a protest party. Contrary to previous research, demographic variables, such as gender, marital status, and number of children, play a minimal role.

Baccini and Leemann (2021) noted that there is a sizeable effect on pro-climate voting after experiencing a natural disaster. Carattini et al. (2017) investigated the acceptability of cost-effective climate policies, focusing on voting behavior in Switzerland's 2015 ballot, where energy taxes intended to replace value-added taxes were rejected. The analysis revealed that concerns about distribution,

competitiveness, and perceived ineffectiveness reduced support for taxes, with many tax revenues allocated for environmental purposes.

Other important locally cited works on US politics include Beland and Boucher's (2015) study confirming Democrats' success in combating air pollution; Guber's (2001) examination of environmental voting preferences in the American electorate; Fredriksson et al.'s (2011) research noting that when it comes to environmental policy, governors seem to be driven mainly by their desire to remain in office rather than by strong personal convictions; Davis and Wurth's (2003a) confirmation that framing the issue in terms of economic trade-offs diminishes the influence of environmental concerns; and McAlexander and Urpelainen's (2020) analysis of environmental roll-call votes.

Table 4. Most local cited articles

Title	Authors & Year	LC	GC
Elections matter: Theory and evidence from environmental policy	(List & Sturm, 2006)	21	212
Niche Party Success and Mainstream Party Policy Shifts – How Green and Radical Right Parties Differ in Their Impact	(Abou-Chadi, 2016)	12	225
Fertile soil: explaining variation in the success of Green parties	(Grant & Tilley, 2019)	10	43
The perennial success of the German Greens	(Rüdig, 2012)	8	26
Demand for environmental goods: Evidence from voting patterns on California initiatives	(Kahn & Matsusaka, 1997)	7	145
Polluting politics	(Beland & Boucher, 2015)	7	24
Voting preferences and the environment in the American electorate	(Guber, 2001)	6	38
Are politicians office or policy motivated? The case of US governors' environmental policies	(Fredriksson et al., 2011)	6	30
Do natural disasters help the environment? How voters respond and what that means	(Baccini & Leemann, 2021)	6	34
An Empirical Study of the Determinants of Green Party Voting	(Schumacher, 2014)	5	23
It's not easy being green: Why voters punish parties for environmental policies during economic downturns	(Abou-Chadi & Kayser, 2017)	5	30
Voting preferences and the environment in the American electorate: The discussion extended	(Davis & Wurth, 2003)	4	21
Parties, Politics, and Regulation: Evidence from Clean Air Act Enforcement	(Innes & Mitra, 2015)	4	26
Green Taxes in a Post-Paris World: Are Millions of Nays Inevitable?	(Carattini et al., 2017)	4	113
Elections and Policy Responsiveness: Evidence from Environmental Voting in the US Congress(sic)(sic)Palabras Clave	(McAlexander & Urpelainen, 2020)	4	10

LC: Local Citations; GC: Global Citations

The most locally cited references by the articles in our dataset are foundational works that have profoundly influenced research in the fields of political behavior, voting, and environmental policy (Table 5). Upon a comprehensive evaluation, it became evident that publications published in the *American Journal of Political Science* held a leading position. Books on empirical methodologies have been frequently cited. Furthermore, along with the articles and books that encompass voting behavior in a broad sense and establish the theoretical foundation for the articles in our dataset, there are also citations of research explicitly undertaken on green voters.

Many of the titles on the most cited references list are books from the founding schools of thought in the voting behavior literature, prominently featuring Rational Choice Theory. Anthony Downs's (1957a, 1957b) article "An Economic Theory of Political Action in a Democracy" and a book entitled *An Economic Theory of Democracy* are the most cited references. Additionally, founding books such as *The American Voter, Retrospective Voting in American National Elections*, and the *Silent Revolution* are widely cited.

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Table 5. Most local cited references

Title	Authors & Year	LC
An Economic Theory of Political Action in a Democracy	(Downs, 1957b)	23
Elections matter: Theory and evidence from environmental policy	(List & Sturm, 2006)	21
Issue Ownership in Presidential Elections, with a 1980 Case Study	(Petrocik, 1996)	20
An Economic Theory of Democracy	(Downs, 1957a)	19
Electoral Backlash against Climate Policy: A Natural Experiment on Retrospective Voting and Local Resistance to Public Policy	(Stokes, 2016)	17
Competition Between Unequals: The Role of Mainstream Party Strategy in Niche Party Success	(Meguid, 2005)	16
Myopic Voters and Natural Disaster Policy	(Healy & Malhotra, 2009)	15
Make It Rain? Retrospection and the Attentive Electorate in the Context of Natural Disasters	(Gasper & Reeves, 2011)	14
Going green: Explaining issue competition on the environment	(Spoon et al., 2014)	14
How Lasting Is Voter Gratitude? An Analysis of the Short- and Long-Term Electoral Returns to Beneficial Policy	(Bechtel & Hainmueller, 2011)	13
The American Voter	(Campbell et al., 1960)	13
Retrospective Voting in American National Elections	(Fiorina, 1981)	13
Randomized experiments from non-random selection in US House elections	(Lee, 2008)	13
Silent Revolution	(Inglehart, 1977)	13
Niche Party Success and Mainstream Party Policy Shifts – How Green and Radical Right Parties Differ in Their Impact	(Abou-Chadi, 2016)	12
Mostly Harmless Econometrics: An Empiricist's Companion	(Angrist & Pischke, 2009)	12
Exploring the Stabilization of a Political Force: The Social and Attitudinal Basis of Green Parties in the Age of Globalization	(Dolezal, 2010)	12
Nine Second-Order National Elections – A Conceptual Framework for the Analysis of European Election Results	(Reif & Schmitt, 1980)	12
Environmental Policy and Party Divergence in Congress	(Shipan & Lowry, 2001)	12
The Nature and Origins of Mass Opinion	(Zaller, 1992)	12

LC: Local Citations

Besides Downs; Petrocik (1996), Meguid (2005), Abou-Chadi (2016), Spoon et al. (2014), Shipan and Lowry (2001), and Lee's (2008) research can be evaluated as having parallels with the Rational Choice Theory. Petrocik (1996) demonstrated how politicians highlighted different groups of problems throughout their campaigns. Beyond the impact of conventional voting indicators, election results coincide with problems that matter to voters, and individual voting decisions are significantly influenced by these problems. This study is particularly relevant for analyzing how environmental issues are framed and owned by different political entities. Meguid (2005) examined how the strategies of electorally and politically dominant parties affect single-issue niche parties such as the Greens in Western Europe. Similarly, by employing a time-series cross-sectional analysis of Western European democracies, Spoon et al. (2014) contended that the level of response from other parties towards the issue mobilization of green parties is contingent upon two factors: the degree of electoral threat posed by the green party to a particular party, and the degree to which the political and economic environment renders the green issue a possible winner in the vote. Examining how US congressional voting on environmental issues has changed, Charles R. Shipan and William R. Lowry (2001) pay close attention to whether Republicans and Democrats have converged or separated over time on environmental policy. Tracking congressional voting behavior from 1970 to 1999 using League of Conservation Voters (LCV) scores, the analysis reveals that over time, the two parties have differed greatly: Republicans show falling support for environmental measures, while Democrats boost their support.

David S. Lee (2008) offers a thorough analysis of the incumbency advantage in US House elections using a regression discontinuity design (RDD). This study focuses on how closely elections in

which a candidate wins or loses may be utilized to determine the causal effect of incumbency on electoral success. Lee contends that the circumstances surrounding the threshold of winning or losing closely contested elections provide a natural experimental environment that allows academics to draw causal conclusions about the impact of incumbency. The main finding of this study is that incumbencies offer considerable electoral benefits. In particular, incumbents are more likely to be re-elected; their party has an increased chance of keeping the district seat in the next election and their vote share increases. This incumbency advantage results from the fact that, usually more experienced and with resources superior to rivals, incumbents increase their probability of electoral success. Furthermore, this study underlines the deterrent effect of incumbency advantage on possible rivals, thereby lowering the probability of fierce opponents standing against incumbents in subsequent elections.

Stokes (2016), Healy and Malhotra (2009), Gasper and Reeves (2011), and Bechtel and Hainmueller (2011) followed Fiorina's (1981) retrospective voting approach. While policies to combat climate change have broad public support, there can be intense opposition from local communities that are forced to bear the costs of these policies and projects, as Stokes's (2016) study has shown. He maintained that people are concerned about climate policy and are inclined to penalize current administrations for having renewable energy infrastructure, such as wind turbines, in proximity that they believe is detrimental to their neighborhoods. Although Gasper and Reeves (2011), Healy and Malhotra (2014), and Bechtel and Hainmueller (2011) examine how voters evaluate elected officials after disasters, they also address different aspects of this issue. According to Gasper and Reeves (2011), voters punish officials for severe weather damage but reward or penalize them based on how they respond to requests for federal assistance, demonstrating that voters can distinguish between the event itself and the government's actions. Healy and Malhotra, however, showed different types of inconsistency. While voters reward immediate disaster relief, they fail to recognize the value of disaster preparedness, causing officials to underinvest in preventative measures that could significantly reduce future damage. However, Bechtel and Hainmueller (2011) challenged this assumption of purely short-term voter memory by examining the electoral impact of Germany's response to the 2002 Elbe flood. Their analysis shows that beneficial policy responses can generate lasting voter gratitude.

List and Sturm (2006) and Zaller's (1992) studies align most closely with the Michigan School. List and Sturm's (2006) article appears among the most globally and locally cited articles in our dataset and is the second most cited reference locally. In *The Nature and Origins of Mass Opinion* John R. Zaller (1992) mostly makes the case that elite discourse and media political information flows greatly influence public opinion. According to Zaller's Receive-Accept-Sample (RAS) model, people's political opinions depend on their political awareness, predispositions, and information intake; they are not set. While less knowledgeable people often accept most of the information they encounter, Zaller noted that those with greater political awareness are more inclined to reject communication that contradicts their predisposition. The relevance of this book to the study of voting behavior is that it shows how voters develop their beliefs and make electoral judgments; therefore, it is useful for grasping voting behavior. This emphasizes the extent to which individuals' impressions of candidates, policies, and political events depend on their political awareness and exposure to media messages. His approach also emphasizes that elite influence determines the political context in which voters' function, thereby influencing their voting behavior. Examining how media campaigns, political ads, and elite speech affect voting behavior in democracies benefits from this perspective.

Martin Dolezal (2010), Karlheinz Reif, and Hermann Schmitt's (1980) approaches can be considered within the confines of the Columbia School. Dolezal (2010) examined the continuing electoral success of green parties in Western Europe. By building a coalition of voter groupings that possesses both unique social traits and a set of particular beliefs, this study implies that green parties have become known as consistent political players. Younger, highly educated, urban, and working in sociocultural fields, green voters are usually additionally likely to embrace libertarian ideals, environmental preservation, and pro-immigration laws. The study shows that the green vote is anchored more in structural and attitudinal elements than previously believed, contrasting past ideas that

characterized it as issue-based or protest-driven. Reif and Schmitt (1980) introduced the concept of "second-order national elections" to explain European election results. They suggest that, although European Parliament elections are supranational, cleavage and domestic political concerns have a greater impact. Because these elections are sometimes regarded as less important than national ones, first-order arenas, voter turnout, and voting patterns differ. The timing of each country's national political cycle shapes European elections and often reflects voter discontent with the current government. They serve as supplemental and secondary national elections rather than global elections. This framework is especially pertinent in multilevel governance systems where voters can prioritize national problems, even in elections with more general consequences. It provides an understanding of how, particularly in situations where national and supranational interests cross, voter turnout, preferences, and party performance can change, depending on the perceived significance of the election.
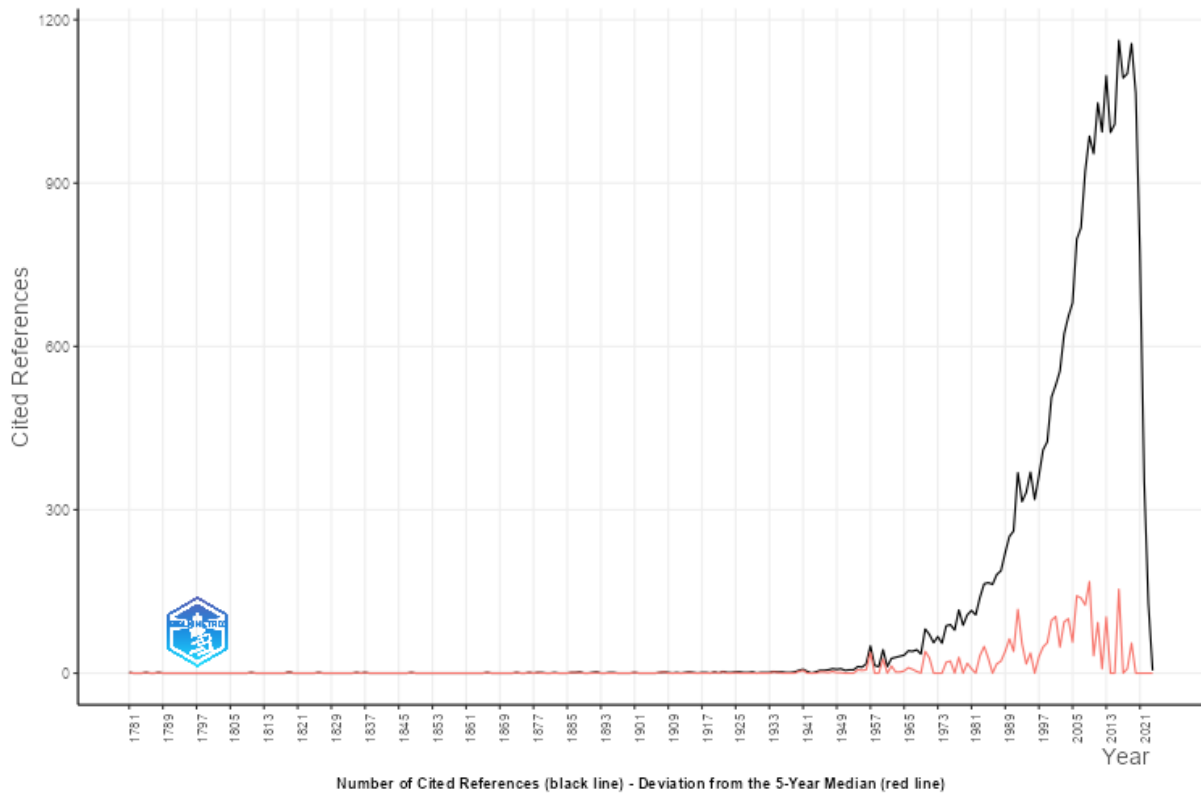
Joshua Angrist and Jörn-Steffen Pischke's (2009) book, *Mostly Harmless Econometrics: An Empiricist's Companion*, which is not aligned with any specific school of voting behavior, provides a clear and comprehensive introduction to significant econometric techniques for identifying causal correlations in observational data. The authors emphasize valuable instruments such as regression discontinuity design (RDD), instrumental variables, and linear regression. The significance of this work in the context of voting behavior lies in its emphasis on causal inference, which is crucial for understanding the impact of various factors, such as policy changes or incumbency, on electoral outcomes.

The reference publication year spectroscopy (RPYS) depicted in Figure 14 provides an analysis of the distribution of publication years for cited references, offering insights into the temporal focus of the literature being cited. The number of cited references before 1940 is minimal, with the black line remaining close to zero. The gradual increase in citations starting around the mid-20th century, visible in the black line, likely corresponds to the rise of behaviouralism in US universities. Behavioralism, with its focus on empirical methods for studying political behavior, including voting, has provided the methodological foundation for a significant amount of research. As this approach gained traction, more studies began citing foundational work that used these methods to analyze voting behavior.

The 1990s marked a notable point, where the number of citations (black line) increased more sharply. This period coincides with the emergence and growth of environmental voting behavior studies in the literature. As environmental issues became more prominent in public discourse and political agendas, the academic community began to focus on how these issues influenced voting behavior. This has led to a significant increase in the number of studies and, consequently, the number of citations.

The differentiation between the black and red lines in the 1990s suggests that the field was experiencing significant developments, likely driven by the introduction of environmental concerns into political behavior studies. The red line, which shows deviation from the 5-year median, indicates that certain years during this period saw especially influential publications that deviated significantly from the norm, likely reflecting groundbreaking work at the intersection of environmentalism and voting behavior. These studies are also aligned with the peaks depicted in Figure 2.
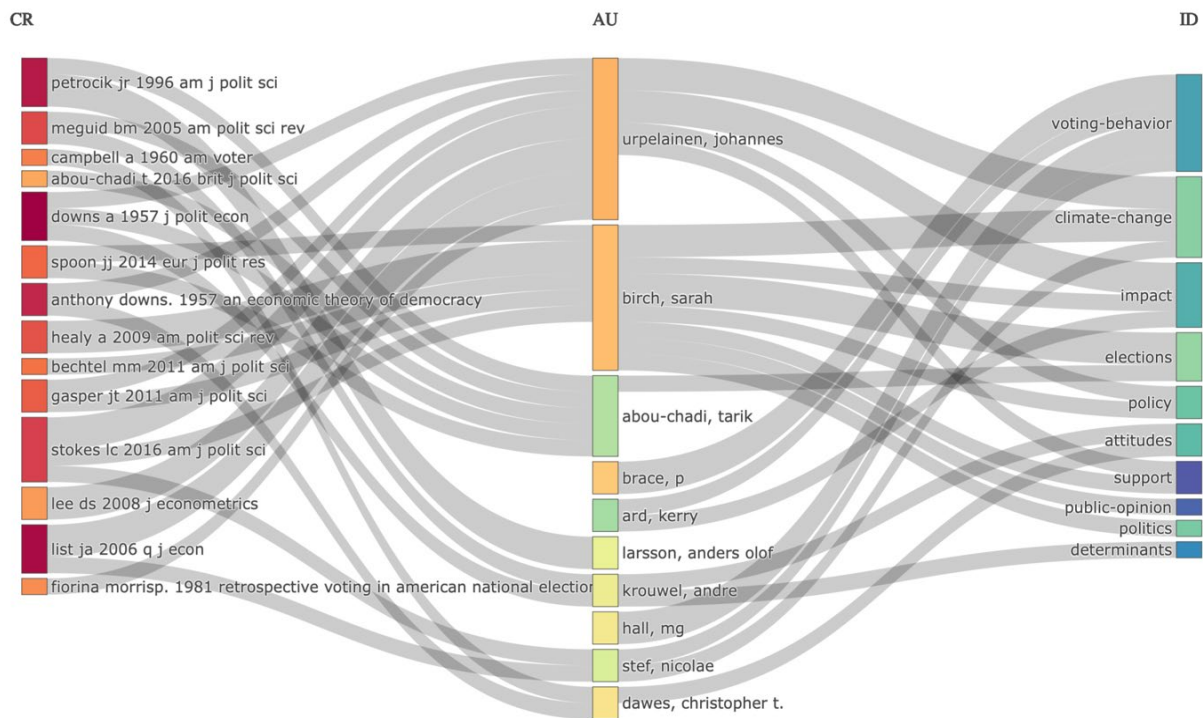
The continued rise in citations in the 21st century suggests that research on environmental voting behavior has become increasingly prevalent. The steep incline of the black line indicates the rapid accumulation of research building in earlier works, whereas the deviations captured by the red line point to pivotal moments or key publications that further differentiated the field.

Figure 14. Reference publication year spectroscopy

Examining the connections among key resources, primary authors, and commonly utilized keywords will yield a comprehensive understanding of this research domain and offer a concise overview of the section. A Sankey plot depicting the association between important cited references, prominent writers, and frequently used Keywords Plus IDs is shown in Figure 15. This identifies the subject on which the key authors worked, and the references used. Publishing articles on "climate change," "environmental impact," "environmental policy," and "political support" Urpelainen refers to Downs (1957a, 1957b), Gasper and Reeves (2011), Stokes (2016), Lee (2008), List, (2006), and Fiorina's (1981) works, whereas Birch refers to Spoon et al. (2014), Healy & Malhotra (2009), Bechtel and Hainmueller (2011), Gasper and Reeves (2011), and Stokes (2016) to produce articles on "climate change," "environmental impact," "environmental policy," "environmental politics," "elections," "public opinion," and "political support." Both authors integrate aspects of the Michigan School while placing a reduced emphasis on societal factors that correspond with certain elements of the Columbia School. While referring to Campbell et al. (1960), Christopher T. Dawes, a political scientist known for his research on political psychology, whose focus on individual "attitudes" and beliefs aligns with the Michigan School's focus on psychological factors in voting decisions, Abou-Chadi and Krouwel use classical Rational Choice Theory sources to analyze "elections," "attitudes," and "determinants" of voting behavior.

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Figure15. Relationship between major references (CR), authors (AU), keywords plus (ID)

4.4. Themes of Environmental Voting Behavior Research

When we performed bibliographic coupling analysis on the first 200 most-cited articles in the dataset, as shown in Table 6, Cluster 2 had the largest number of articles (63). Cluster 4 was next, with 38 articles with lower local impact values. Cluster 1, with 33 articles, had a lower centrality, whereas Cluster 3, with 32 articles, had the highest local impact and centrality measures of any cluster. Cluster 5 had 25 studies, whereas Cluster 6, which had the lowest impact and centrality values, had only nine publications.

Table 6. Bibliographic coupling clusters of the first 200 articles

Cluster	Frequency	Centrality	Impact	Color
1	33	0,36	1,44	
2	63	0,53	1,84	
3	32	0,57	2,24	
4	38	0,55	1,43	
5	25	0,46	1,20	
6	9	0,35	1	

Figure 16 presents a map of article clusters derived from the bibliographic coupling analysis, illustrating the centrality and impact of each document collection. Emphasizing the influence of ideology, economic interests, and media consumption on voters' attitudes towards environmental policies, the articles in Cluster 1 examined the intersection of environmentalism, voting behavior, and policy acceptability. This collection is referred to as *The Ideological Dynamics of Environmental Voting*. This theme relates to the Columbian School's concept of cross-pressure, which elucidates the conflicts between environmental concerns and economic interests that influence voter decisions. A recurring topic is the polarization of environmental issues, wherein political philosophy significantly shapes public support for programs, including carbon taxes, green regulations, and pro-environmental voting in both the United States and Europe. Several studies have demonstrated that voters' preferences are formed by

distributive, economic, and ideological disparities, particularly between conservatives and progressives. For instance, rejection of carbon fees in Switzerland and Washington State underscores how voters' ideological positions and economic concerns interact with policy formulation. Furthermore, traditional and digital media consumption polarizes environmental ideas, thereby reinforcing existing opinions rather than fostering new ones. Additional studies illustrate how race and ethnicity influence environmental voting; minority groups, including African Americans and Hispanics in the US Congress, exhibit more pro-environmental voting patterns than their white counterparts. These studies generally highlight the challenges of implementing green policies in democratic settings, as voter behavior is motivated by a combination of economic, social, and ideological factors. Also, the discourse of Green parties is also linked to the ideological foundations of environmental social movements. For example, from an eco-Marxist perspective, Green parties position alternative economic models that challenge capitalism, whereas from an eco-feminist perspective, they develop policies that establish connections between ecological crises and gender inequality (Anderson et al., 2023; Ard & Mohai, 2011; Babutsidze et al., 2023; Carattini et al., 2017; Colantone et al., 2024; Joseph et al., 2023; Marquet et al., 2024; Mohai & Kershner, 2002; Saha, 2023; Schumacher, 2014; Sugg & Weir, 2023; Wang & Mei, 2024; Wattier & Tatalovich, 2000; Yan et al., 2024).

Cluster 2's theme is *The Role of Environmental Politics in Shaping Political Behavior*, and the articles in this cluster examine how niche parties—particularly green parties—may influence mainstream political behavior, public opinion, and policy responsiveness in various electoral environments. These studies highlight the impact of green parties on mainstream parties' emphasis on environmental concerns, thereby affecting their policy agendas and occasionally inducing changes. Moreover, the public salience of environmental policy and climate change significantly influences voter behavior and party orientation. The articles also investigate how non-democratic governments engage with international environmental agreements and how social media participation, political structures, and party policies shape voters' responses to environmental issues across diverse electoral systems (Abou-Chadi, 2016; Alvarez & Morrier, 2024; Bayer & Tafazzoli, 2024; Bene et al., 2022; Fagerholm, 2016; Furceri et al., 2023; Gibbons & Evans, 2023; Grant & Tilley, 2019; Han & Finke, 2023; Huckfeldt & Sprague, 1992; Koger, 2009; Lichtin et al., 2023; Lüth & Schaffer, 2022; Mazzoleni, 2009; McAllister & bin Oslan, 2021; Meeks, 2023; Miragliotta, 2013; Otjes & Krouwel, 2023; Peeters & Coffé, 2024; Piston et al., 2018; Pollex & Berker, 2024; Quoss et al., 2024; Rüdig, 2012; Schwörer, 2024; Seeberg & Adams, 2024; Tonnesen et al., 2023; Trenchs et al., 2023; Whitley et al., 2023).

Under the theme of *Electoral Incentives and Partisan Dynamics in Environmental Governance*, Cluster 3 examines how political party affiliation, electoral incentives, and lobbying influence environmental policies and outcomes. Research indicates that Democratic governors and legislators frequently implement more stringent pro-environmental legislation than their Republican counterparts, consequently reducing pollution levels and increasing environmental expenditures. Notably, in closely contested elections, electoral incentives motivate politicians to support environmental concerns before voting. Furthermore, corporations strategically adjust their pollution abatement efforts based on the governing parties. This cluster emphasizes the significance of party politics, elections, and lobbying in shaping environmental policies and aligns with the Rational Choice Theory. It examines how politicians and voters make strategic decisions based on electoral incentives, consistent with the rational actor model (Beland & Boucher, 2015; Boyce & Nilsson, 1999; Chaudoin & Woon, 2018; Cooper et al., 2018; Di Maria et al., 2024; Fredriksson et al., 2011; Gulen & Myers, 2024; Heitz et al., 2023; Innes & Mitra, 2015; Kahn & Matsusaka, 1997; Kim & Urpelainen, 2017; List & Sturm, 2006; Magontier et al., 2024; McAlexander & Urpelainen, 2020; Meyer, 2019; Pacca et al., 2021; Ringquist & Dasse, 2004).

The studies in Cluster 4 examined the interrelationship between natural disasters, environmental factors, and political behavior under the theme of *Environmental Shocks and Electoral Dynamics*. These investigations analyze how natural disasters influence voting behavior, electoral outcomes, and political engagement, with several studies focusing on how voters respond to politicians' environmental position-taking during and after extreme weather events. Some studies have investigated the electoral
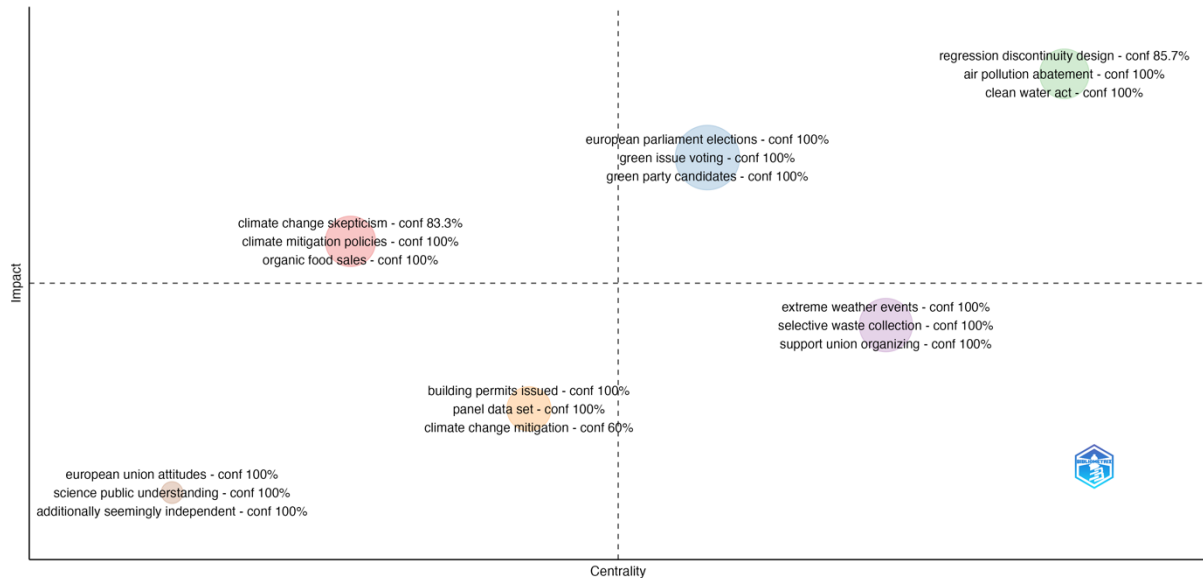
consequences of environmental externalities, such as hydraulic fracturing and wind farm development, while others have examined the relationship between natural disasters and support for green parties or environmental legislation. Additionally, studies explore how gender affects environmentally virtuous behavior, genetic variation in political participation, and how environmental factors, such as wind speed, can influence vote choice (Baccini & Leemann, 2021; Baraldi et al., 2024; Birch, 2023a; Boomhower, 2024; Brace & Jewett A, 1995; Collingwood et al., 2024; Egli et al., 2022; Elliott et al., 2023; Fair et al., 2017; Fowler et al., 2008; Guber, 2001; Hilbig & Riaz, 2024; Isaksson & Gren, 2024; Kronborg et al., 2024; Liao & Junco, 2022; Menge et al., 2024; Mo et al., 2023; Zelin & Smith, 2023).

Cluster 5, *The Tension Between Democracy and Environmentalism*, examines the complex relationship between democratic processes and environmental governance, highlighting the tension between short-term electoral incentives and long-term objectives of environmental sustainability. Multiple studies have demonstrated that elections frequently incentivize politicians to prioritize immediate economic gains over environmental protection, resulting in increased deforestation and relaxed regulations during competitive election periods, particularly in tropical and developing nations. This tension is evident in democratic transitions, in which politicians exchange environmental goods for electoral support, thereby undermining long-term sustainability. Conversely, other studies suggest that democratic accountability can also encourage pro-environmental behavior, with incumbents limiting environmental degradation to avoid voter disapproval, especially in non-OECD countries. The role of political ideology is also crucial, as left-leaning governments are more likely to adopt stringent, long-term climate policies, whereas centrist and right-wing parties tend to favor less ambitious, short-term environmental measures. Furthermore, the resilience of industries such as renewable energy to political shocks is examined, as evidenced in the aftermath of the 2016 US elections, where renewable energy firms outside this country experienced significant financial losses due to the political shift. These studies provide insights into persistent conflict within democracies, where brief election cycles and voter biases frequently conflict with the necessity for progressive environmental policies, prompting inquiries about democratic institutions' capacity to address global environmental issues in the long term (Aklin, 2018; Birch, 2023b; Boly et al., 2023; Cazals & Sauquet, 2015; Cronert & Nyman, 2024; Gourley & Khamis, 2023; Martelli et al., 2018; Masyutina et al., 2023; Morpurgo et al., 2023; Ogami, 2024; Sanford, 2023; Schulze, 2021; Stef & Ben Jabeur, 2023; Tawiah & Zakari, 2024; von Stein, 2022).
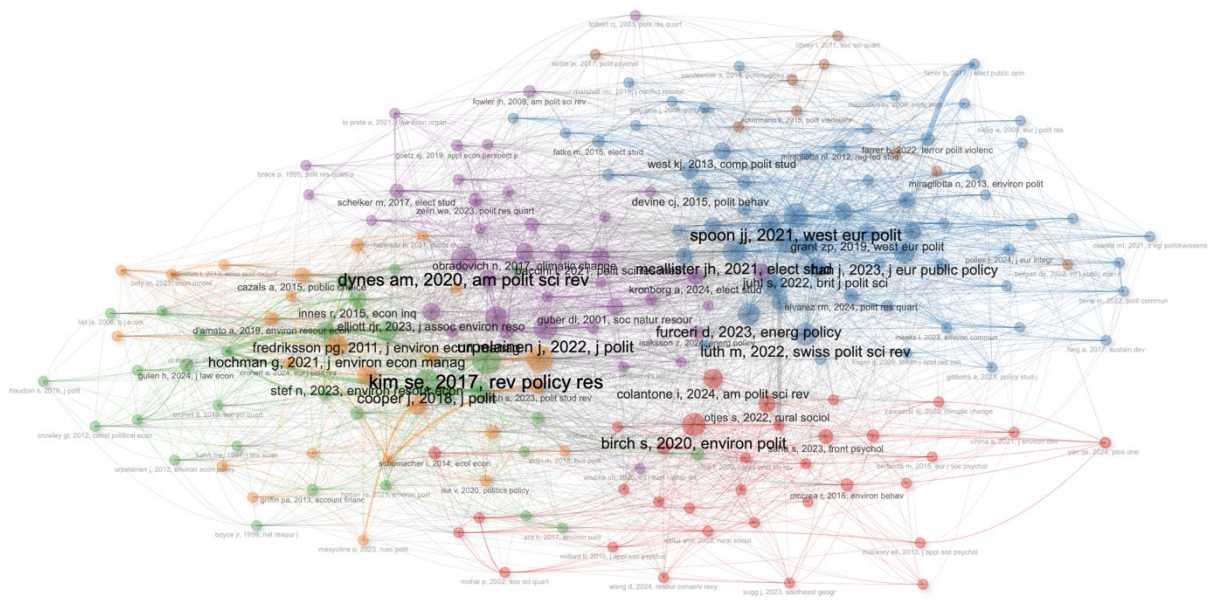
The Michigan School's emphasis on individual attitudes and beliefs is reflected in Cluster 6, *Understanding the Psychological Foundations of Environmentalist Political Behavior*. In this cluster, the relationships among personality traits, political opinions, and environmental factors influencing democratic participation were investigated. Specifically, the studies examine how personality traits, including those within the Big Five model—Openness, Conscientiousness, Extraversion, Agreeableness, and Neuroticism—influence political choices, party affiliation, and attitudes towards significant issues, including sustainability. For instance, low conscientiousness and openness predict Green Party support, suggesting that voters' preferences for environmental policies are influenced by personality. Research demonstrating how direct democratic settings and institutional factors can mitigate the impact of traits such as agreeableness on party affiliation and electoral behavior reveals another significant theme: the interaction between personality and political contexts. Concurrently, research on the influence of political efficacy, whether genetically determined or environmentally influenced on voter turnout and engagement emphasizes how an individual's sense of control may affect their likelihood of voting. Voter knowledge and decision making are also significantly influenced by the broader political context, including media coverage, campaign expenditure, and the structure of electoral contests. As personality plays a crucial role in how individuals engage with political issues, particularly in areas such as environmental sustainability and direct democracy, these documents demonstrate that democratic participation is a complex interplay between individual traits, political settings, and environmental stimuli (Ackermann & Freitag, 2015; Bakker & de Vreese, 2016; Bergan et al., 2022; Bleidorn et al., 2024; Johnson & Rickard, 2017; Littvay et al., 2011; Nicholson, 2003; Settle et al., 2017; Torres & Smith, 2018).

Figure 16. Map of document clusters by bibliographic coupling

As illustrated in Figure 17, Clusters 3 and 5 have a strong correlation, largely based on econometric estimations. Clusters 1 and 4 were centrally located. Cluster 4 exhibits the highest number of interconnections with other clusters because it introduces a more global and cross-national perspective than many traditional voting theories that often focus on single-country contexts. Cluster 2 exhibits a higher degree of independence than all other clusters, apart from Cluster 6. Collectively, the clusters suggest a more complex model of voter decision-making than traditional theories. They indicate that environmental voting behavior is influenced by a combination of ideological, psychological, institutional, and contextual factors.

Figure 17. Bibliographic coupling network of documents

5. Conclusion

In the post-war period, with the emergence of behavioralism in American political science, studies on political and voting behaviors have become increasingly prominent. By the late 1980s, global awareness of environmental issues had begun to increase, supported by influential reports from

international organizations such as the United Nations. This heightened attention, coupled with environmental degradation and climate change, led to the signing of binding agreements among member states, significantly elevating the political profile and visibility of the Green Movement, whose origins can be traced back to the 1960s. Concurrent with these developments, research on environmental voting behavior has begun to gain prominence in the broader field of voting behavior studies. Nevertheless, it is important to note that the dominant methodological individualist approach in this field relied heavily on positivist nomothetic social sciences to achieve widespread consensus on quantifiable social phenomena. This assertion was excessive, as "scientific" knowledge has undergone historical evolution and the definition of universal truth has consistently shifted from one locus of power to another(Konuralp, 2018).

In our research, we identified that the first study on environmental voting behavior in the Web of Science database appeared in the early 1990s, reflecting growing academic interest in this subject. This interest continues to increase over time. *Electoral Studies*, *Environmental Politics*, *Review of Policy Research*, and *Social Science Quarterly* have been frequently published on this topic, with *American Journal of Political Science* as a key reference point for many of the cited works in our dataset.

The United States produces the most research in this field, with noticeable growth in output compared to other countries. The most prolific author is Johannes Urpelainen, a professor at the Johns Hopkins University. The most frequently cited economists are John A. List and Daniel M. Sturm, whose article, "Elections matter: Theory and evidence from environmental policy," stands out as the most highly cited publication in this dataset.

Based on a bibliographic coupling analysis that grouped articles with common references, we identified six clusters of research. The first cluster of articles focuses on *The Ideological Dynamics of Environmental Voting*, primarily addressing climate-change mitigation policies and challenging climate-change skepticism. The second cluster, *The Role of Environmental Politics in Shaping Political Behavior*, examines political party strategies and public engagement in environmental politics, particularly in the European context and green parties. The third cluster, *Electoral Incentives and Partisan Dynamics in Environmental Governance*, concentrates on political influence, environmental regulations, air pollution abatement, and the Clean Water Act. The research primarily employed a regression discontinuity design. Fourth, the research theme on *Environmental Shocks and Electoral Dynamics* refers to extreme weather events, selective waste collection, and support for union organizations.

In the fifth cluster, *Tension Between Democracy and Environmentalism*, numerous articles discussed the issuance of building permits, typically utilizing panel datasets. According to the sixth cluster's research on *Understanding the Psychological Foundations of Environmentalist Political Behavior*, liberal democracy has reached a stalemate. This is because protecting the environment may sometimes require extreme measures, like putting in place new taxes and bans, or even going after the system of mass production and consumption that supports the current "welfare" system.

The literature on environmental voting behavior reveals that the influence of classical studies on voter behavior is minimal. Despite the foundational works of the Michigan School, the Chicago School, and Rational Choice Theory, which date back to the mid-20th century, their impact on the study of environmental voting behavior has been notably limited. For instance, articles in our collection make a mere 85 references to these classical works, with Rational Choice Theory, particularly its prospective and retrospective voter behavior strands, receiving the most attention. This suggests that the field of environmental voting behavior, which emerged in the 1990s, is distinctly dynamic, contemporary, and innovative, drawing more heavily on modern approaches than on earlier theoretical frameworks.

However, along with this development, the literature also exhibits several gaps that merit further attention. One critical issue is the limited geographical scope of existing research. Much of the work in this field has focused on developed countries, particularly North America and Europe. This leaves significant blind spots in understanding environmental voting behavior in the Global South,

where the impacts of climate change are often more pronounced, and socio-political contexts differ considerably. Addressing this imbalance offers an inclusive and global perspective.

Another limitation was the lack of interdisciplinary integration. While the field has benefitted from insights into political science, sociology, and environmental studies, it could also be enriched by greater interactions with disciplines such as psychology, economics, and communication studies. These fields offer valuable perspectives that could deepen our understanding of the multifaceted factors that influence environmental voting behavior.

The literature also tends to cluster around broad themes, leaving the nuances of specific environmental issues under-explored. For example, how distinct concerns, such as pollution, climate change, and biodiversity loss, influence voter preferences remain inadequately examined. Exploring these dimensions will provide critical insights into the development of tailored and effective policies.

Methodologically, the field relies heavily on quantitative approaches, which, while valuable, often fail to capture the complexity of environmental voting behavior. More sophisticated methodological frameworks combining quantitative and qualitative methods are required. Techniques such as interviews, case studies, and the integration of insights from behavioral economics and social psychology could provide a richer and more comprehensive understanding of voter behavior.

Furthermore, most studies adopt a short-term perspective, limiting their ability to trace changes in environmental voting behavior over time. Longitudinal research is essential to explore how shifts in voter behavior correlate with political events, economic conditions, or environmental crises. Such studies can offer critical insights into the stability and evolution of environmental voting patterns.

The impact of emerging technologies is underexplored. Social media and online platforms play an increasingly significant role in shaping environmental discourse and influencing voting behavior. However, few studies have examined how these technologies affect voter behavior, particularly in the context of misinformation and the spread of online climate denialism. This gap is especially pronounced in studies that focus on the negotiation of government interventions against environmental degradation within liberal democratic frameworks. Research addressing these dynamics would provide crucial insights into the interplay between digital media, environmental policies, and voter behavior.

Finally, the rise of right-wing populism poses unique challenges for environmental governance. There is a growing need for studies exploring how stringent and sometimes interventionist measures to combat environmental degradation are debated in a popular-democratic context. Such research could illuminate how environmental policies are contested and shaped by broader political ideologies, thus offering valuable contributions to environmental studies and contemporary governance.

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