Trinity College Dublin
Coláiste na Tríonóide, Baile Átha Cliath
The University of Dublin

Department of Political Science

Does Nature Vote? How Natural Disasters and Demographics Shape Environmental Voting Outcomes in Switzerland

Author: Stefan Keel

Supervisor: Dr. Martina Kirchberger

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Abstract

One of the current political topics is policies to mitigate climate change. This dissertation investigates the influence of natural disasters on pro-environmental voting behaviour in Switzerland. It examines whether extreme weather events, such as floods and landslides, correlate with increased support for environmental measures in municipal votes. Building on the research of Baccini and Leemann (2021), who reported a 20% positive influence of natural disasters on pro-environment votes, this study re-evaluates their findings with updated data from 1995 to 2023, incorporating the additional socio-economic variables income, age, gender and religion.

The replication of Baccini and Leemann (2021) confirms their key findings, including that there is a positive influence observable. However, it was evaluated to have an effect size of 7.6%, which was 12.4% less than previously suggested. This is due to the more extended observation period and, therefore, more natural disasters and environmental voting ballots. Among the newly introduced variables, age emerges as the most significant factor in determining pro-environmental voting behaviour, whereas income shows a weaker impact than initially anticipated. Education displays an effect in an entropy-balanced model but lacks significance in the applied model. These results underscore the complex interplay between demographic factors and support for environmental policies, highlighting the necessity of a multifaceted approach when assessing the political impacts of natural disasters. The replication and the analysis were done by applying linear regression models to check for the direct influence of the variables. Furthermore, to evaluate the role of education and the temporal decay, an entropy-balanced model was applied.

[0]Replication files are publicly accessible: github.com/keeleek0/dissertation

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Student Name:	Stefan Keel
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I have read and I understand the plagiarism provisions in the General Regulations of the University Calendar for the current year, found at: http://www.tcd.ie/calendar

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Signed: Stefan Keel Date: August 6, 2024

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1 Introduction

In recent years, the growing frequency and severity of natural disasters like floods, landslides, and rock slides have raised significant concerns about their impacts on communities and the environment. Switzerland's geographical characteristics make it particularly susceptible to natural disaster events. The country's complex topography and climatic conditions create a high risk for various natural hazards, which are expected to intensify with ongoing climate change (MeteoSchweiz, 2023). Such natural disasters cause material damage, threaten livelihoods, and, unfortunately, can result in the loss of lives. As these more frequent natural disasters are linked to climate change, experiencing them may influence public opinion and voting behaviour concerning environmental and climate change mitigation policies. These conditions provide a compelling context for studying the interplay between environmental experiences and political behaviour.

The dynamic between natural disasters and subsequent voting behaviour experiences increasing importance in political science. Research has indicated that experiences with climate-related events can shape public attitudes towards environmental policies. For instance, a pivotal study by Baccini and Leemann (2021) analysed Swiss data from 1995 to 2010, revealing that natural disasters positively impacted pro-environmental voting in affected municipalities by 20%.

Moreover, the increasing public awareness and scientific consensus on climate change have intensified the urgency to understand the social and political dynamics influencing support for environmental policy to tackle this global challenge. As noted by Funk and Kennedy (2020), public concern about climate change is growing globally, influencing political agendas and policy-making processes.

The study of voting behaviour in the context of natural disasters offers insights into the broader implications of climate change on democratic processes. As citizens experience the direct impacts of environmental change, their support for policies aimed at mitigating these effects could increase. This hypothesis aligns with the concept of "issue voting" (The Concise Oxford Dictionary of Politics, 2024) where voters' choices are influenced by specific issues that directly affect their lives. In understanding this relationship, environmental policies that gather public support can be developed.

Switzerland's political system, characterised by direct democracy, offers a unique opportunity to observe these dynamics. The frequent referendums [1] allow real-time analysis of how environmental events could influence voting behaviour. The Swiss system ensures that citizens have a direct say in policy decisions, making it an ideal case study for examining the relationship between natural disasters and voting outcomes.

1.1 The Role of Socio-Demographic Factors

Previous studies highlighted the influence of education, political affiliation, gender, income, religion, and age on environmental concerns and policy support. For example, higher education levels are usually linked to increased environmental awareness and greater support for green policies (Schumacher, 2014). Individuals with higher education are more likely to understand the scientific basis of climate change and the importance of supporting proactive environmental policies.

Political affiliation also plays a crucial role. Individuals aligned with left-leaning parties tend to support environmental policies more than those affiliated with right-leaning parties (Mayer and Smith, 2023). This divide often reflects broader ideological differences regarding government intervention and market regulation.

Gender differences in political environmental participation have been documented by (McCright and Xiao, 2014) and attributed to different socialisation processes, risk perception, and value systems. The author of this very paper questioned these findings as the difference effect was weak and, especially in political participation, almost not detectable.

Income levels could influence voting behaviours. Participation in the voting process is more probable for individuals with higher incomes, possibly because they have the financial resources to manage the political engagement costs. In contrast, lower-income individuals may prioritise immediate economic concerns over participating in the voting process Kulachai et al. (2023). It would be interesting to investigate the effect of income levels in the context of natural disasters and pro-environmental voting. Ard and Fairbrother (2017), who investigated the theory that companies follow a political path of least resistance by locating plants and facilities that pollute the environment in low-income and minority communities, takes income in the context of income/capital into the equation. The study tested whether social capital influences the proximity of communities to airborne toxin sources and found that differences in social capital do not significantly explain environmental

[1] The Swiss referendum is a democratic process where citizens vote on specific legislative or constitutional issues, created either by a mandatory vote on amendments, a popular initiative requiring 100'000 signatures, or a facultative referendum with 50'000 signatures challenging a law passed by parliament, occurring about four times a year on average.

inequality. Thus, while higher-income individuals may have more capacity to support environmental initiatives, structural factors like social capital and demographic variables also play crucial roles in environmental inequities.

Age is another factor that can influence environmental attitudes. Younger individuals commonly support environmental policies to a higher grade than older generations. This trend could be partly explained by generational differences in values and experiences. Inglehart (1997) argues that economic development, cultural, and political change are interconnected. As societies develop through industrialisation and subsequent postmodern shifts, values change as well and, therefore, reflect the evolving economic and political environment. These changes occur with a generational time lag, meaning that the younger generation that grew up with different values and awareness could prioritise sustainability and environmental protection as they are to face the long-term consequences of climate change (Inglehart, 1997). Additionally, the rise of youth-led environmental movements, such as Fridays For Future (2024) (FFF), has further increased awareness and activism among younger - as well as older - demographics. Nevertheless, mostly only younger individuals actively support FFF.

One of the least studied factors is the relationship between different religions and attitudes towards green policies. Religious beliefs could - hypothetically - shape environmental attitudes and behaviours. Religious beliefs and values could influence the relationship of individuals with the environment and their responsibility towards it. For example, religious teachings that emphasise stewardship and the moral duty to protect creation could motivate pro-environmental attitudes (Arbuckle and Konisky, 2015). Conversely, some religious perspectives may prioritise human dominion over nature, potentially leading to lower support for environmental policies.

1.2 Gaps in the Literature

Existing research underscores the complex relationship between personal experiences with natural disasters, socio-demographic factors, and voting behaviour. While studies like those by Hoffmann et al. (2022) and Egan and Mullin (2012) illustrate that direct climate change experiences can heighten environmental concerns and support for environmental policies, there remains a need to explore how these dynamics have evolved recently. Additionally, the specific impact of socio-demographic factors on environmental voting - under the effect of a natural disaster - requires further investigation.

Prior analyses have indicated that education and political affiliation influence environmental attitudes (Schumacher, 2014; Mayer and Smith, 2023). However, integrating variables such as gender, income, religion, and age into the examination could provide a more nuanced understanding of how different segments of the population respond to environmental challenges and policy proposals.

1.3 Objectives, Gaps and Contributions

Substantial research has explored the impact of natural disasters on voting behaviour and the influence of socio-demographic factors. However, gaps remain in understanding how these dynamics evolve over time and in the presence of experiencing a natural disaster. Most studies focus on short-term analyses, lacking a comprehensive perspective that incorporates long-term data and multiple influencing factors.

This study addresses these gaps by extending the analysis of Baccini and Leemann (2021) to include data up to the year 2023 - extending from previously 1995 to 2010 - and introducing new socio-demographic variables such as gender, income, age, and religion. Furthermore, an analysis of temporal changes was conducted. This approach offers indications of how these factors influence pro-environmental voting behaviour in Switzerland and how public support for climate policies can evolve in response to the rising frequency and first-hand experience of natural disasters over time.

This study aims to re-evaluate and extend the findings of Baccini and Leemann (2021) by:

- Utilising updated natural disaster data from the WSL to cover the period from January 4, 1995, to December 27, 2022. Building upon the work of Baccini and Leemann (2021), which defines the disaster effect on voting outcome as null after ten months, this study includes voting data up to ten months after the last disaster.
- Introducing new variables such as gender, income, age, and religion to assess their impact.
- Analysing whether the increasing frequency and severity of natural disasters correlate with changes in voting behaviour over time.

By addressing these aspects, this study provides insights into the factors driving pro-environmental voting behaviour in Switzerland after experiencing natural disasters. It also indicates how recent socio-economic and environmental developments have influenced public support for climate policies.

1.4 Significance of the Study

Understanding the drivers of public support for environmental policies is crucial to address the challenges of climate change. This research contributes to this understanding by offering a long-term perspective on how natural disasters and socio-demographic factors influence voting behaviour. The findings can inform about the potential impacts of natural disasters on public opinion and could guide the development of more effective climate strategies.

Additionally, focusing on Switzerland — a country with a system of direct democracy and robust data collection — provides insights into how environmental concerns are translated into voting outcomes and offers a setting to explore the intersection of natural disasters, socio-demographic factors, and voting behaviour.

Switzerland's unique political landscape, emphasising direct democracy, ensures citizens have a significant voice in policy decisions. This system reflects and shapes public opinion, as the outcomes of referendums influence future political and social dynamics.

In conclusion, this work aims to provide insights into the relationship between natural disasters and pro-environmental voting behaviour by introducing the role of socio-demographic factors. By extending the analysis to 2023 and incorporating new variables, this work aims to provide a comprehensive and nuanced perspective on the evolving landscape of environmental politics in Switzerland. The insights from this study will be valuable for policymakers, scholars, and practitioners addressing the urgent challenges of climate change through informed and effective policy measures.

2 Literature Review

Studying voting behaviour in the effect of natural disasters is crucial for understanding public support for environmental policies. This dissertation explores how socio-demographic factors such as gender, age, income, education, and religion influence voting behaviour in Switzerland, particularly after experiencing natural disasters at a municipal level. It also considers how these experiences shape support for pro-environmental measures.

2.1 Impact of Natural Disasters

Switzerland is prone to natural hazards such as floods and landslides (McBean, 2004). The small mountainous country has experienced a significant increase in natural disasters as a result of climate change. The average temperature in Switzerland has risen by about 2°C since 1864, which is more than twice the global average. This general rise in temperature has led to more frequent and intense heatwaves, heavy precipitation events (+12% in severity and +30% in frequency from 1901-2015), and a reduction in snowfall at lower altitudes. These changes have substantially impacted the natural environment and human activities in the region (BAFU, 2024).

The study by Baccini and Leemann (2021) analysed data from 1995 to 2010 and found that municipalities affected by natural disasters could exhibit increased support for pro-environmental policies by 20%. This suggests that direct experiences with climate impacts can drive public support for environmental measures.

In 2010, Spence et al. (2011) analysed data from a national survey involving 1'822 UK residents to explore the relationships between flood experiences, climate change perceptions, and energy-saving preparedness. Their findings indicated that individuals who have experienced flooding show heightened concern about climate change, perceive it as more critical, and feel more confident in their actions' impact on positively affecting it. The change in mindset leads to a greater willingness to save energy to combat climate change.

Spence et al. (2011) found that individuals who have been directly affected by natural disasters are more likely to support energy-saving measures and climate change policies. On the contrary, a negative contributing factor to not acting on climate change mitigating tasks is the lack of personal experience with its consequences. From this viewpoint, those who directly experience events potentially linked to climate change are more likely to be concerned and, consequently, more motivated to adopt sustainable behaviours. However, the evidence supporting this hypothesis remains limited.

2.1.1 Temporal Aspects and Increased Frequency

More frequent and intense natural disasters in Switzerland can impact public opinion and policy support. According to Andres and Badoux (2019) and further defined for Switzerland by MeteoSchweiz (2023), there has been a notable rise in flood and landslide events over recent decades. This trend underscores the need for effective climate policies and highlights the role of public support in driving these measures.

Howe et al. (2019) found that repeated exposure to extreme weather events increases public concern about climate change and support for environmental policies. Between the years 1995 and 2022, a total of 17'693 natural disasters were recorded by WSL.

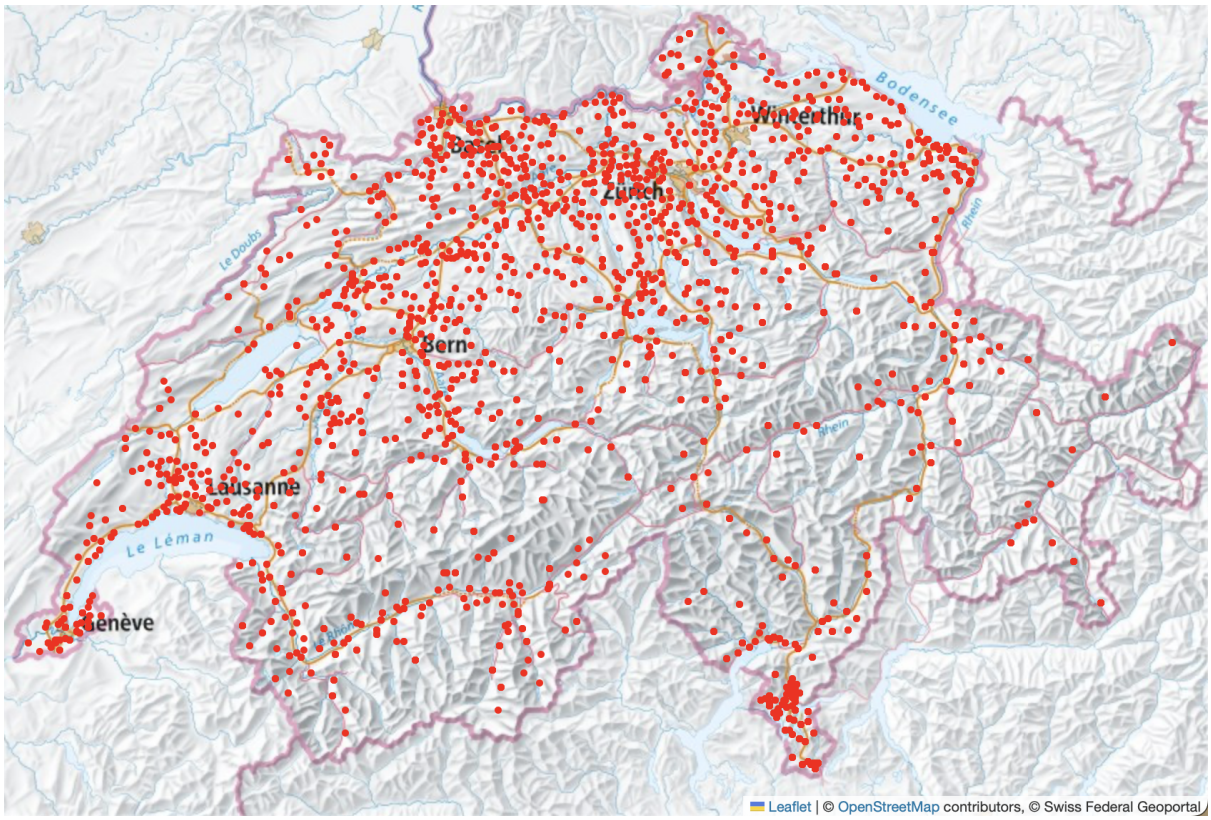

Figure 2.1: All Natural Disasters 1995-2022 in Switzerland

Figure 2.1 displays with red dots all natural disaster events between 1995 and 2022 that are linked to a environmental voting. It is visible that natural disasters are recorded in settlements in the valleys, plains, and waterbodies in Switzerland.

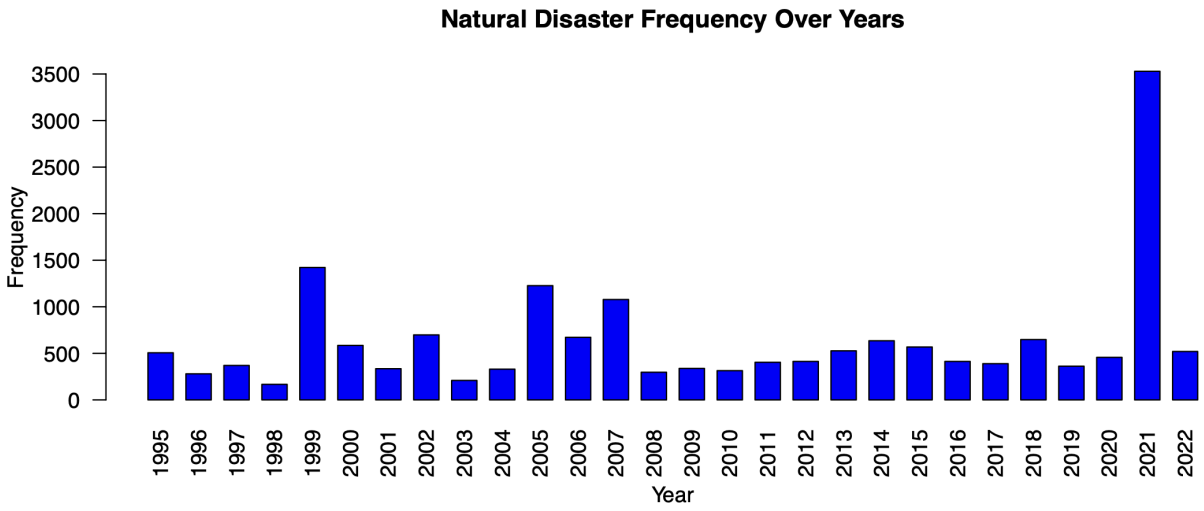

Figure 2.2: Frequency of Natural Disasters from 1995 - 2022

Although Switzerland always recorded a fair amount of natural disasters, it is visible that the frequency is increasing over time, with a peak in 2021.

2.2 Gender

Gender differences significantly shape environmental attitudes and voting behaviour. Research consistently shows that women are more likely to support pro-environmental policies than men. The trend is attributed to different socialisation processes and risk perceptions, where women often express greater concern for environmental and social issues (McCright and Xiao, 2014).

This pattern was found to be present in voting behaviour on environmental topics, where women tend to vote more pro-green policies (Hunter et al., 2004). Moreover, Xiao and McCright (2012) argue that women's greater environmental concern is linked to their greater perception of risk. Lastly, their analysis found consistent support for the hypothesis that women are more concerned than men about health-related environmental problems.

Further, a study by Sundström and McCright (2014) found that the gender gap in environmental attitudes is present within the general public in Western countries and is influenced by cultural and socio-economic factors. Their research, which utilised data from the Swedish polity, revealed that women report greater environmental concern than men across the general public and at the municipal and county council levels. However, the effect in the Swedish Parliament, the apparent effect of gender (of respective Swedish Parliament members), is largely explained by political orientation, suggesting that the influence of gender on environmental concern is complex and context-dependent.

Adding another edge to this complex setup, Hunter et al. (2004) found in their cross-national study that women's greater risk aversion and concern for safety and health drive their higher pro-environmental behaviour. The study indicates that these gender differences are robust across different cultural contexts and remain significant even when controlling for other socio-demographic factors. In conclusion, gender effects in the context of pro-environmental voting after being affected by a natural disaster can be various and complex. Testing it in this new setting shall provide another view.

2.3 Age

Younger voters are generally more concerned about climate change and more supportive of environmental policies than older generations. This trend could be linked to a higher level of environmental awareness and, in general, higher education among younger individuals. Furthermore, Smith and Leiserowitz (2014) found that emotions such as worry, interest, and hope are stronger predictors of climate change policy support than cultural worldviews or socio-demographic variables. That could suggest that the emotional responses of younger people play a significant role in their support for environmental policies.

Inglehart (1997) argues that younger generations, influenced by post-materialist values, prioritise environmental protection more than older generations. This is particularly relevant in Switzerland, where youth engagement in climate movements has increased recently. Fridays for Future (FFF) rapidly gained momentum globally, raising questions about its impact. A survey of Swiss residents (N = 1'206) showed that Greta Thunberg and FFF positively influenced environmental concern and behaviour, with 30% and 23% of participants, respectively, reporting increased environmental awareness and actions. Positive evaluations were linked to environmental attitudes and education, while negative evaluations were linked to justifications for harmful behaviours. Most reported changes were in private sphere behaviours such as mobility, consumption, and waste management Fritz et al. (2023).

A study by Funk (2021) found that younger adults globally are more likely to view climate change as a major threat and support aggressive policies to address it. The generational gap in environmental attitudes suggests that as younger, more environmentally conscious generations age, support for green policies is likely to increase. Individuals of older age may prioritise economic stability over environmental concerns, potentially due to a lower perceived personal impact of environmental issues or a focus on economic benefits or unawareness of environmental issues.

Eisenmenger et al. (2020) argue that this trend can also be seen in the case of Sustainable Development Goals (SDGs). While the agenda lists protection as a key goal, economic growth is prioritised over ecological sustainability, displaying the main challenges in balancing these objectives, especially in industrialised nations where economic interests overshadow environmental considerations.

2.4 Income

Givens and Jorgenson (2011) found that income is a strong predictor of environmental concern, with higher-income individuals exhibiting more pro-environmental attitudes due to their ability to bear the economic costs of such policies.

Kahn and Matsusaka (1997) argue that economic constraints often drive lower-income groups to focus on immediate financial needs rather than long-term environmental benefits. Ard and Fairbrother (2017) found that differences in social capital do not significantly explain environmental inequality. While communities with more social capital tend to be located further away from polluting facilities, this effect is slight and does not fully account for the disparities observed. Economic constraints and immediate survival needs might drive lower-income individuals to prioritise economic stability over environmental quality.

Additionally, a study by Staats et al. (2004) indicates that wealthier households tend to adopt more pro-environmental practices and support policies supporting sustainability. Their EcoTeam Program (ETP), which combines information, feedback, and social interaction, was found to effect durable changes in household behaviour for households with different income, education and other demographic levels, resulting in reductions in resource use.

Interestingly, Clark et al. (2003) suggest that while higher income is generally associated with greater environmental concern, this relationship is deemed to be more complex and influenced by confounding effects such as education, access to information, and cultural values. Their study integrates psychological and economic themes, analysing data from participants in a premium-priced green electricity program and highlighting the roles of both internal and external influences on pro-environmental behaviour.

2.5 Education

Education could be correlated with pro-environmental attitudes and behaviours. In Switzerland, individuals with higher levels of education are more likely to support environmental policies (Baccini and Leemann, 2021). Educated individuals often exhibit a higher awareness of environmental issues and an understanding of the long-term benefits of sustainable practices. This correlation is attributed to better access to information and a higher likelihood of valuing scientific consensus on climate change.

Hornsey and Fielding (2020) explain that education increases one's acceptance of scientific information, leading to greater support for environmental policies. Additionally, educated individuals are more likely to recognise the complex socio-economic impacts of environmental degradation and their ability to mitigate these negative effects through their own input, such as pro-environmental voting. This can also be observed in the more favourable voting patterns towards environmental protection among the educated population (Schultz, 2002).

Gelissen (2007) found that education increases environmental awareness and knowledge, which in turn promotes pro-environmental attitudes and behaviours. The study revealed that educated individuals should have the possibility to understand the complexity of various environmental issues and acknowledge the necessity for comprehensive policy solutions.

Moreover, Meyer (2015) suggest that school environmental education programs can significantly enhance students' environmental awareness and commitment to sustainability. This effect extends beyond formal education, as lifelong learning and access to information play crucial roles in shaping environmental attitudes and behaviours.

2.6 Religion

The effect of religion on environmental policy support varies, with some religious groups showing more substantial support for environmental stewardship than others. This variation is often linked to differing theological interpretations and the integration of environmental concerns into religious teachings (Sherkat and Ellison, 2007). Therefore, religious beliefs can shape environmental attitudes and voting behaviour.

Arbuckle and Konisky (2015) examined how likely are different religious communities going to support environmental policies, reflecting on a broader trend where religious values intersect with ecological consciousness. People who follow Judeo-Christian religions, such as evangelical Protestants, Catholics, and mainline Protestants, generally show less concern for environmental protection compared to non-religious individuals. This lack of concern becomes more pronounced the more religious these individuals are.

Additionally, Guth et al. (1995) suggest that in some cases, religious beliefs can hinder support for environmental policies, mainly when they are interpreted in ways that emphasise human dominion over nature rather than stewardship. Their analysis shows that conservative eschatology, religious tradition, and religious commitment are strongly associated with less support for environmentalism. However, conservative eschatology is the most significant religious predictor of negative environmental perspectives.

Switzerland's laws on freedom of religion provide a unique context for examining how different religious traditions influence environmental attitudes and behaviours. Studies such as Hempel (2021) indicate that religious groups and communities could have an influence on their members when environmental issues are concerned.

3 Methodology

The methodological approach applied in this work includes the research design, data collection and integration processes, data pre-processing steps, statistical analysis techniques, and lastly, ethical considerations.

3.1 Research Design

The study utilised a quantitative research design, building on the work of Baccini and Leemann (2021) to further examine the connection between experiencing natural disasters and pro-environmental voting behaviour.

The analysis primarily utilised regression analysis, employing linear models to analyse the impact of natural disaster experiences on voting outcomes. The approach includes various factors as control variables to account for their potential influence. Additionally, entropy balancing was implemented to achieve a covariate balance between treated and control groups, consistent with the methodology used by Baccini and Leemann (2021). Expanding the scope, new variables were introduced, and temporal effects were analysed.

3.2 Scope of the Study

Both temporal and geographical dimensions define the scope. Temporally, the study spans from January 4, 1995 (the first natural disaster in the dataset) to June 18, 2023 (the last environmental voting in the 10-month time frame after the previous disaster in the dataset), offering a dataset that captures trends and changes in voting behaviour over nearly three decades. Geographically, the analysis includes and is limited to all Swiss municipalities, totalling 2'136 by the end of 2022 (the most recent available update for municipality data). This extensive coverage ensures that the study covers diverse communities, each with distinct experiences of natural disasters and demographic characteristics.

3.3 Data Collection

The data for this study was sourced from three sources and integrated into a cohesive dataset through a meticulous matching process. The WSL was the primary source of natural disaster data. This dataset includes detailed records of natural disaster events from January 4, 1995 to December 27, 2022, aligning with the source of natural disasters analysed by Baccini and Leemann (2021).

In addition to the disaster data, socio-demographic and voting data were obtained from the FSO. These datasets provide granular insights into demographic variables such as age, education, gender, religion, income, and voting outcomes across Swiss municipalities.

The dataset from Baccini and Leemann (2021) was incorporated to maintain continuity and robustness, particularly for variables related to the disaster proneness of municipalities. Information used from the dataset: Variables related to disaster proneness were directly applied from the Baccini and Leemann (2021) dataset to ensure consistency, as Swiss municipalities' topographical and structural characteristics are likely stable over time and mainly to provide consistency in the replication approach. For the education variable, the primary data source was the updated dataset from the Federal Statistic Office, with missing values supplemented from the Baccini and Leemann (2021) dataset to ensure completeness.

R language with the software R Studio was applied to integrate these datasets, utilising a multi-step matching process. As a first step, datasets were matched based on municipality codes and dates. Additional matching was performed using the names of municipalities to account for changes due to mergers and renaming of municipalities. In cases where exact matches were challenging, a fuzzy matching method (cran.r-project.org) was applied to align entries with minor discrepancies or merging of municipalities, enhancing the accuracy of data integration.

3.4 Variables

Outlined in the introduction and literature review, socio-demographic variables that have been studied in combination with environmental policies were introduced.

The introduced variables:

- Gender
- Age
- Income
- Education
- Religion

All variables were analysed by examining each municipality's respective proportions. Gender was analysed by examining each municipality's proportions of male and female residents. The income was reported in intervals, where the intervals were:

- below CHF 30'000
- CHF 30'000 to 40'000
- CHF 40'000 to 50'000
- CHF 50'000 to 75'000
- above CHF 75'000

Therefore, the income levels were assessed as average intervals per municipality and normalised as shares of the total municipal population.

Age distribution was similarly evaluated, with different age groups analysed as proportions of the total population of each municipality.

Educational attainment levels were considered, and the shares of residents with various levels of education (Tertiary and Tertiary Sekund) within each municipality were analysed. Where Tertiary refers to every inhabitant with that achieved University degree an higher and Tertiary Sekund summarises the obligatory education including professional apprenticeships. Furthermore, Tertiary Sekund also includes people without any education which - in Switzerland - is almost null as education is free and compulsory for each citizen. People without education must have received citizenship after the obligatory schooling age.

Religion was another critical variable, with the distribution of religious affiliations analysed as shares of the total municipal population.

The study also tests environmental variables, notably how extensive the damage caused by natural disasters is, to assess whether there is a difference in whether the event caused small, medium or high monetary damage. The status of municipalities as treated (experiencing a natural disaster) was recorded as a binary variable, with treated equals one (1) to indicate such an experience.

Lastly, and most importantly, positive voting outcomes related to pro-environmental policies were analysed at the municipal level, with results expressed as positive pro-environmental voting support shares.

3.5 Data Pre-Processing

Several pre-processing steps were necessary to prepare the data for analysis. As described, the data matching and integration ensured that datasets were accurately aligned across different sources and periods.

Handling missing data was a further critical aspect of pre-processing. The previous matching process significantly minimised missing data, particularly for socio-demographic variables. Any remaining missing values - only in education - were filled out using data from Baccini and Leemann (2021), ensuring that all necessary data points were available for analysis.

Data normalisation - where all variables were converted to shares within each municipality - allowed for meaningful comparisons across municipalities of varying sizes and demographic compositions, providing a robust basis for the subsequent statistical analysis.

3.6 Statistical and Analytical Methods

The statistical analysis combined the replication of established models with additional regression analyses to explore new aspects of the data. Initially, this study replicated the models used by Baccini and Leemann (2021) up to their entropy-balanced model assessing the effect duration after experiencing a natural disaster, employing linear regression to evaluate the impact of natural disasters on voting behaviour. These models included various socio-demographic controls to account for their potential influences.

To examine the differences in voting behaviour before and after the significant rise of the climate movement, marked by a practical cutoff date of August 20, 2018, when Greta Thunberg managed to reach a wide audience (Rescourio and Tridimas, 2023), additional regression analyses were conducted. These regressions were performed separately and on the entire set of environmental votes. This approach allowed a nuanced exploration of how the timing of climate activism influenced voting patterns differently from the broader trend observed since 1995.

3.6.1 Rationale for Excluding Interaction Terms

The primary objective of this study was to understand the direct effects of individual socio-demographic variables on pro-environmental voting behaviour. While interaction terms can provide insights into the interplay between variables, they also introduce substantial complexity into the models. This complexity can obscure the main effects, which are of primary interest to this research. Therefore, the models did not include interaction terms to maintain clarity and focus on the direct relationships.

3.7 Validity and Reliability

To ensure the outcomes' validity and reliability, the study focuses on the robustness of the replicated models. The alignment of the replication results with Baccini and Leemann (2021) findings provided confidence in the initial models. The observed differences were in expected ranges and did not require additional robustness checks.

3.8 Tools

R was primarily used for statistical analysis and data handling, with packages such as dplyr, tidyverse, lm, MatchIt, and stringdist employed for data manipulation, regression analysis, entropy balancing, and fuzzy matching. R's capabilities in handling datasets, statistical functions, and ease in providing free accessible code for replication made it ideal for quantitative analysis.

Python with Jupyter Notebook was explicitly used to visualise map plotting. Packages like matplotlib, seaborn, pandas, and folium were used to generate detailed and customisable visual representations.

The replication code documents the specific packages and their versions used. It is publicly available for verification and further research.

3.9 Ethical Considerations

Ethical guidelines were carefully taken into account throughout the data collection and analysis processes. The primary data sources for this study were publicly available under the Swiss government's Open Data Act (OGD Office, 2019), ensuring that their use was ethically compliant. The disaster data requested from the WSL did not require additional ethical checks as it is intended for public research and analysis, and this work is not intended for publication.

Socio-demographic and voting data from the FSO were openly accessible for public use. The Baccini and Leemann (2021) dataset, used for replication purposes, was also publicly available for academic replication.

It is acknowledged that religious affiliations can sometimes diverge from scientific perspectives, and these differences might be subject to varying interpretations. Nevertheless, these observations warrant further detailed investigation and are not the focus of this research, as their significance was only present in very few models and not consistent.

The study focused on aggregated data at the municipal level, avoiding using any personally identifiable information. This approach ensures compliance with the Switzerland's data privacy standards and protects individual confidentiality. Furthermore, the publicly available replication code documents the dataset creation process, statistical modelling, and visualisation steps.

4 Data Analysis and Results

This chapter analyses the impact of natural disasters on pro-environmental voting behaviour and includes new variables in Swiss municipalities from 1995 to 2023.

To validate and extend Baccini and Leemann (2021) findings, regression models similar to those used in their study were employed.

The Appendix 6.1 contains a complete list of used votes and the summaries of the regression models. Table 4.1 summarises the replication results.

4.1 Replication

Three votes had to be excluded from the analysis:

- "Federal Decree: EFTA-Indonesia Agreement"
  (Bundesbeschluss über die Genehmigung des Umfassenden Wirtschaftspartnerschaftsabkommens zwischen den EFTA-Staaten und Indonesien)
- "Initiative Orderly Nuclear Phase-Out"
  (Volksinitiative «Für den geordneten Ausstieg aus der Atomenergie»)
- "Initiative Energy Transition: Phasing Out Nuclear"
  (Volksinitiative «Strom ohne Atom - Für eine Energiewende und die schrittweise Stilllegung der Atomkraftwerke»)

These votings confounded the results due to the non-typical support of the votes of parties and argumentation, following Baccini and Leemann (2021). This is because green parties were promoting the shutdown of nuclear power plants, and other parties that typically oppose environmental voting were promoting these topics. Even after reversing the outcomes, it was impossible to interpret and include that data in this paper. All further analysis was conducted without these votes.

Table 4.1: Replication of Baccini and Leemann's Models (1995-2022)

	Model 1	Model 2	Model 3
Disaster	0.35 ***	0.47 ***	0.35 ***
	(0.13)	(0.14)	(0.13)
Green Party (%)	0.55 ***	-	0.55 ***
	(0.02)	-	(0.02)
Social Democrats (%)	0.28 ***	-	0.28 ***
	(0.01)	-	(0.01)
Christian Democrats (%)	-0.03 ***	-	-0.03 ***
	(0.01)	-	(0.01)
Liberal Democrats (%)	0.71 ***	-	0.71 ***
	(0.05)	-	(0.05)
Swiss People's Party (%)	-0.03 ***	-	-0.03 ***
	(0.01)	-	(0.01)
Rainfall (mm)	-	-410.79	-315.62
	-	(338.10)	(327.13)
No vegetation (%)	-	-68.19	-52.08
	-	(48.62)	(47.03)
Share of Water (%)	-	3.98 *	2.58
	-	(2.05)	(1.99)
Share of Gras (%)	-	-2.44	-1.90
	-	(1.97)	(1.90)
Artificial Surface (%)	-	0.70	0.52
	-	(0.60)	(0.58)
R^2	0.86	0.85	0.86
Adj. R^2	0.85	0.84	0.85
Num. obs.	34,082	34,066	34,066

Significance levels: * p < 0.10, ** p < 0.05, *** p < 0.01

Disaster represents the outcome variable of pro-environmental voting. Model 1 shows the shares of party affiliation within municipalities. Model 2 includes disaster-proneness factors like rainfall, lack of vegetation, share of water, share of grass, and artificial surface. This accounts for the municipalities' disaster proneness. Model 3 includes all influences and provides a levelled outcome for the outcome variable. This model setup was applied to test the new variables and temporal cutoffs.

4.1.1 Interpretation of Replication Results

Replicating Baccini and Leemann (2021) models with updated data confirms their key findings. The positive and significant coefficients for the disaster variable - the positive vote share for environmental voting - across all models suggest that municipalities affected by natural disasters tend to vote in favour of pro-environmental policies. This aligns with the original study, although the extended dataset's coefficient is smaller (Baccini and Leemann (2021) Model 3 Disaster coefficient of 1.19).

Furthermore, the impact/effect of political affiliation within a municipality was studied. The voting shares for the Green Party and Social Democrats positively influence pro-environmental voting, while the Swiss People's Party exhibits a negative or negligible impact. These results underscore the correlation between political ideology and environmental voting behaviour and provide further robustness as they align with (Baccini and Leemann, 2021).

These models also display the importance taking into account the local environmental conditions and political contexts when analysing voting behaviour to provide a comparable ground truth for municipalities.

4.1.2 Heterogeneity in Time

To further test with an extended time frame (1995 to 2023), the work of Baccini and Leemann (2021), the heterogeneity in time and space, and the entropy balanced model with the variable education was analysed.

The analysis reveals insights into how the impact of natural disasters on pro-environmental voting behaviour varies over time. Table 6.6 presents the heterogeneity in time analysis results, showing the coefficients for models with and without the time between the flood and the vote as a variable.

Table 4.2: Heterogeneity in Time

	Model 1	Model 2
Constant	38.08 ***	38.08 ***
	(0.15)	(0.15)
Treatment (Disaster)	1.10 ***	3.19 ***
	(0.30)	(0.48)
Time between Flood and Vote		-0.32 ***
		(0.07)
Deviance	15,785,814.92	15,762,456.46
Dispersion	390.22	389.64
Num. obs.	40,455	40,455

Significance levels: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

The results indicate that the treatment effect (positive vote share for a municipality experiencing a natural disaster) of natural disasters on pro-environmental voting remains positive and significant for both models. Model 2, which includes the time between the flood and the vote, shows a larger treatment effect (3.19) compared to Model 1 (1.10). The negative coefficient for the time between the flood and the vote (-0.32) in Model 2 suggests that the positive influence of a natural disaster on voting behaviour diminishes over time, supporting that the positive effect vanishes after roughly ten months.

These findings support the importance of considering the temporal aspect when evaluating the influence of experiencing natural disasters and their subsequent effect on voting behaviour. As the time after a disaster occurs passes, the immediate urgency and salience of environmental issues fades, reducing the support for pro-environmental voting.

4.1.3 Heterogeneity in Space: Impact of Education

It was shown that higher levels of tertiary education correlate with increased support for pro-environmental policies (Table 4.3, Figure 4.1). The interaction term in Model 3 indicates that disaster exposure is amplified in municipalities with a higher share of tertiary-educated residents, suggesting a more nuanced response among these populations.

Table 4.3: Effect of Socio-Demographic Variables and Education on Voting

	Model 1	**Model 2**	**Model 3**
Intercept	38.08 ***	33.64 ***	35.18 ***
	(0.15)	(0.41)	(0.41)
Treatment (Disaster)	1.10 ***	1.33 ***	-2.29 ***
	(0.30)	(0.30)	(0.86)
Tertiary Education (%)	-	30.16 ***	19.70 ***
	-	(2.52)	(2.47)
Treatment × Education	-	-	25.34 ***
	-	-	(5.58)
Deviance	15,785,814.92	15,655,929.04	15,633,699.73
Dispersion	390.22	387.01	386.46
Num. obs.	40,455	40,455	40,455

Significance levels: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Higher education levels indicate support for pro-environmental voting in the context of recent disaster experiences. Educated individuals are probably more aware of the scientific background of climate change and the importance of pro environmental efforts, making them more responsive to environmental policies.

The results also suggest that socio-demographic factors can influence the impact of natural disasters on voting behaviour.

The visualisations provide a clear and intuitive understanding of how disaster exposure and education interact to influence voting behaviour. They also highlight the temporal dynamics of these effects, suggesting that the immediate impact of natural disasters may fade over time as other issues become more salient.

The left panel in Figure 4.1 shows that municipalities with higher shares of tertiary-educated residents exhibit stronger pro-environmental voting tendencies. The interaction between disaster exposure and education highlights the critical role of education in shaping environmental attitudes and behaviours. The right panel illustrates that the impact of

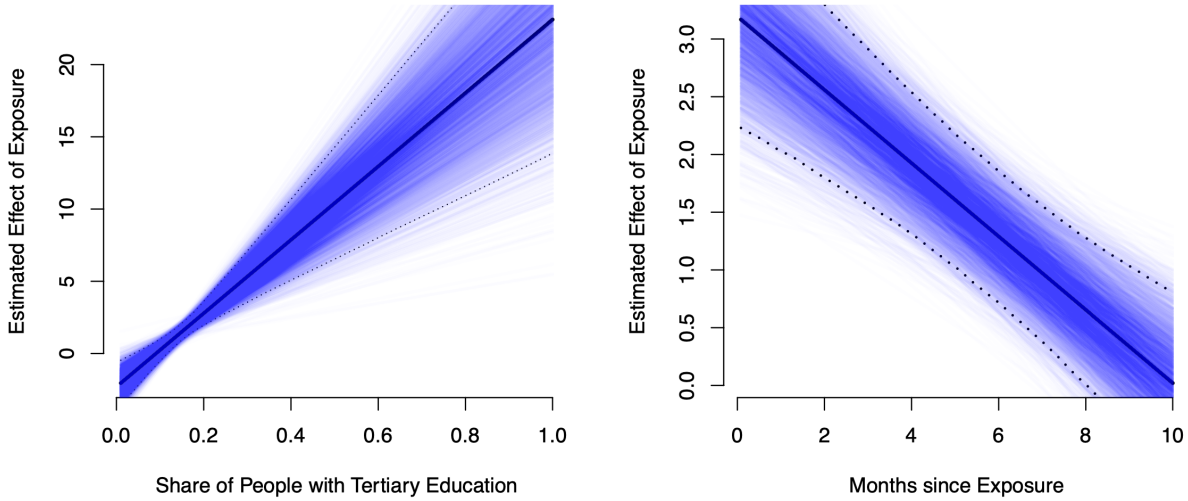

Figure 4.1: Marginal Effects of Disaster Exposure by Educational Level and Over Time.

disaster exposure on pro-environmental voting decreases over time. This finding suggests that the effect is more pronounced immediately following a disaster but diminishes as time passes. Whilst education shows very similar results to the work of Baccini and Leemann (2021), the decay over time is less stable in the extended analysis but agrees with an effect of null after ten months.

4.2 Socio-Demographic Variables

The analysis is divided into parts, focusing on different socio-demographic variables: income, age, education, gender, religion, and disaster-related damage extent. We further split the data into two time periods, before and after August 20, 2018, to examine if there are any temporal differences in voting behaviour for these new variables.

4.2.1 Income

The results of the income analysis are presented in Appendix Table 6.7.

The analysis indicates that municipalities with a higher share of the income bracket above CHF 75'000 and that experienced a natural disaster have a positive coefficient. Income brackets CHF 40'000 to 50'000 and below CHF 30'000 have a negative coefficient. The other income brackets do not show a significant coefficient.

The finding is in line with previous studies that suggest people with higher incomes (0.08***) are more likely to support pro-environmental policies because they can bear the associated costs. On the contrary, individuals with lower incomes (-0.07***) may prioritise immediate economic concerns over long-term environmental benefits, leading to less support.

4.2.2 Age

The analysis shows municipalities with a higher proportion of younger age groups (18-30 years) are more likely to support pro-environmental measures following natural disasters. In contrast, people older than 30 tend to have a negative coefficient. All age groups are significant. The complete results of the age analysis can be found in Appendix Table 6.8.

This could imply that younger individuals are more supportive of environmental policies. In contrast, older individuals may prioritise other concerns over environmental issues.

4.2.3 Education

The results of the education analysis are summarised in Appendix Table 6.9.

In contradiction to the entropy-balanced model, a significant effect could not be found in this model. Therefore, the education variable itself cannot be assessed in this model. The lack of a significant effect for education in this model may be due to multicollinearity with other socio-demographic variables, such as income and political affiliation.

4.2.4 Gender

The gender analysis examines the effect of the proportion of voters in municipalities. Appendix Table 6.10 details the results.

Using the male proportion as the base in the basic model, municipalities with a higher share of females tend to vote more pro-environmental than males if they have experienced a natural disaster and no other variables are included. Nevertheless, the coefficient is not interpretable or significant in the full model. Therefore, gender does not seem to play a significant role in this setting.

This finding contradicts previous research suggesting that women generally support environmental policies more than men McCright and Xiao (2014). The lack of a significant gender effect in this model may be due to Swiss municipalities' specific context or other confounding factors.

4.2.5 Religion

The religious composition is analysed in their respective groups: Protestant, Roman Catholic, Christian Catholic, Orthodox, Other Christian, Jewish, Muslim, Other Religions, and Atheist. The results are shown in Appendix Table 6.11.

Only the Jewish variable displays a significant, very high (56.96) positive coefficient.

The significant positive effect for the Jewish variable suggests that municipalities with a higher proportion of Jewish residents are more likely to support pro-environmental policies. This finding may be due to specific cultural or religious beliefs that emphasise environmental stewardship and the moral responsibility to protect the natural world. Another reason could be that this coefficient mirrors the fact that the most prominent Jewish communities live in the three big cities Zurich, Basel and Geneva, where pro-environmental voting is positive in general (World Jewish Congress, 2024).

4.2.6 Damage Extent

It is not a socio-demographic variable but also essential to analyse in detail. This analysis takes into account all disaster events with all damage extents. It was analysed here to determine whether there is a difference in the effect if the damage extent is taken into account. Damage extent is categorised into three levels: low, medium, and high. The results of the damage extent analysis are detailed in Appendix Table 6.12.

The analysis shows that the extent of damage does not influence pro-environmental voting.

This finding suggests that the mere occurrence of a natural disaster, rather than its severity ratified by the monetary damage, is sufficient to influence voting behaviour. This aligns with previous research indicating that the psychological impact of experiencing a natural disaster can increase awareness and concern for environmental issues, regardless of the extent of the damage Spence et al. (2011).

4.3 Temporal Analysis of Socio-Demographic Variables

To explore the temporal dynamics of voting behaviour on the new variables, the data observation period was split into two periods: before and after August 20, 2018. The findings indicate a noticeable shift in the impact of natural disasters on voting behaviour over time, as detailed in Table 4.4.

The analysis reveals that income and age directly and significantly impact all three (1995-2023, 1995-2018 and 2018-2023) time-frames.

The comprehensive analysis across different socio-demographic variables and temporal periods confirms that natural disasters significantly influence pro-environmental voting behaviour in Swiss municipalities. Variables such as income, age, education, gender, religion, and the extent of damage from disasters all interact with the propensity to vote for environmental policies, with varying degrees of significance and impact. The observed temporal shift, foremost in the age variable, underscores the evolving public perception and the growing importance of addressing climate-related challenges through policy measures.

In analysing the determinants of pro-environmental voting behaviour in Switzerland, the main findings across the full model (M1) — the model for the period before 2018 (M1 <2018) and the model after 2018 (M1 >2018) — were considered. Y represents the outcome variable. In summary, the variables that have shown significance in these three settings were summarised in the table:

Variables	M1	M1 Y	M1 <2018	M1 Y <2018	M1 >2018	M1 Y >2018
Inc. =<30	-0.07***	0.32**	-0.32***	0.07	-0.57	0.20
Inc. 30-40	-0.05		0.02		-0.83*	
Inc. 40-50	-0.05***		-0.03		-0.51	
Inc. 50-75	-0.00		0.03***		-0.00	
Inc. 75<	0.08***		0.06***		-0.23	
Age 18-30	0.36***	0.31***	0.81***	0.07	-0.52***	0.10
Age 31-45	-0.59***		0.02		-0.15	
Age 46-65	-0.93***		-0.63***		-0.67***	
Age 66-85	-1.08***		-1.02***		0.71***	
Age 86-100	-0.41***		-0.88***		0.76*	

Significance levels: *** p<0.01, ** p<0.05, * p<0.1

Table 4.4: Comparison of Models

Income levels show varying impacts on pro-environmental voting. For the lowest income group (≤ 30), a significant adverse effect is observed in the full model (coefficient of -0.07***) and before 2018 (coefficient of -0.32***), but this effect diminishes and becomes insignificant post-2018. This suggests that lower-income voters were less likely to support pro-environmental policies, a trend that has become less pronounced in recent years.

In contrast, the highest income group (> 75) consistently shows a positive impact on pro-environmental voting in the full model (coefficient of 0.08***) and before 2018 (coefficient of 0.06***). This positive influence diminishes after 2018, indicating a potential

shift in the pro-environmental voting behaviour of higher-income individuals, possibly due to changing perceptions of environmental policies or broader economic contexts or lack of data.

Age significantly influences pro-environmental voting behaviour. Young voters (18-30) have a solid positive impact across all models. In the full model, the coefficient is 0.36***, increasing to 0.81 before 2018. However, this effect reverses after 2018, with a negative coefficient of -0.52***.

The impact is consistently negative for middle-aged voters (31-65). The 31-45 age group shows a significant adverse effect in the full model (coefficient of -0.59***), which persists but becomes less pronounced post-2018. Similarly, voters aged 46-65 significantly negatively impact the full model (-0.93***), which remains substantial in both periods.

Older voters (age 66-100) exhibit significant adverse effects in the full model and before 2018. However, a notable shift occurs post-2018, particularly for the 66-85 age group, which shows a positive impact (coefficient of 0.71***). This suggests that older voters have increasingly supported pro-environmental policies in recent years. It can also be interpreted as pro-environmental-minded voters shifting into the age group or combining both.

Nevertheless, the outcome variable "Y" — which is the "Disaster" resp. the positive vote share for environmental voting — is only significant in the full model from 1995 to 2023, and the above-described findings are only indicative and should be considered with care.

4.3.1 Implications of Temporal Analysis

The analysis of the models shows that the impact of demographic and socio-economic factors on pro-environmental voting behaviour has changed over time. Income and age consistently show substantial impacts, with notable changes post-2018. This highlights the dynamic nature of voter behaviour in response to evolving environmental and socio-economic contexts and, most likely, data.

Nevertheless, the models shall be interpreted cautiously. The full model covers data from 1995 to 2023, while model 2 includes data from 1995 to 2018, and the last model only includes data from 2018 to 2023. Furthermore, 2018 to 2023 only consists of a few environmental votes. It is likely to be affected by many confounders, like the COVID-19 epidemic, the economic downturn, and further crises that could strongly influence this small observation period.

4.4 Employing all Variables

This section analyses the impact of all socio-demographic factors on pro-environmental voting behaviour across different periods. The analysis is divided into three models: the full model using the entire dataset, the full model using data from before 2018, and the full model using data from after 2018. The results are presented in Table 4.5.

Table 4.5: Comparison of Full Models Including Significant Variables from Model 3

Variables	**Full Model**	**Full Model <2018**	**Full Model >2018**
Disaster	0.29 **	0.08	0.12
	(0.14)		
Inc. =<30	-0.05 ***	-0.32 ***	
	(0.01)	(0.06)	
Inc. 30-40	-0.07 **		
	(0.04)		
Inc. 75<	0.08 ***	0.06 ***	
	(0.00)	(0.01)	
Age 18-30	0.39 ***	0.85 ***	-0.52 ***
	(0.06)	(0.09)	(0.19)
Age 31-45	-0.44 ***		
	(0.09)		
Age 46-65	-0.83 ***	-0.52 ***	-0.67 ***
	(0.06)	(0.10)	(0.21)
Age 66-85	-0.87 ***	-0.89 ***	0.71 ***
	(0.07)	(0.11)	(0.22)
Age 86-100	-0.30 *	-0.56 **	
	(0.16)	(0.23)	
Jewish	93.88 *	107.03 **	
	(47.93)	(51.53)	
Atheist	-0.54 **	-0.71 ***	
	(0.25)	(0.27)	
R^2	0.87	0.87	0.94
Adj. R^2	0.86	0.86	0.88
Num. obs.	34066	29804	4262

Significance levels: *** p < 0.01, ** p < 0.05, * p < 0.1

The analysis of the model with all variables employed and using the entire dataset reveals that several socio-demographic variables influence pro-environmental voting behaviour. Lower-income brackets ($\leq$ 30 and 30-40) have a negative impact on pro-environmental voting, while higher-income brackets (>75) show a positive effect. Younger voters (18-30) exhibit a strong positive impact, while older age groups (46-65 and 66-85) have displayed a negative influence. Religious shares in municipalities show that Jewish has a significant coefficient but with high standard error as well. In contrast, atheists have a small negative effect with a relatively small standard error.

Similar patterns are observed when analysing data from before 2018, with income, age, and education showing significant impacts. However, the magnitude of the coefficients varies, suggesting temporal dynamics in voter behaviour. For instance, the positive effects of younger voters (18-30) are more pronounced before 2018.

The post-2018 analysis displays changes. The influence of younger voters (18-30) turns negative, while the opposite can be observed for the two age groups, 46-65 and 66-85. This shift could reflect evolving attitudes towards environmental policies among generations or economic and political influences that were not accounted for.

4.4.1 Synopsis of Model Including All Variables

The significant role of income and age highlights the necessity of considering socio-demographic factors. The observed temporal variations could suggest that voter behaviour is dynamic and influenced by changing socio-economic, environmental awareness, and economic circumstances.

Voters in higher income brackets (>75) consistently indicate a positive impact on pro-environmental voting across all models. Conversely, lower-income brackets ($\leq$ 30 and 30-40) exhibit a negative effect, suggesting that wealthier individuals are more inclined to support environmental policies.

Younger voters (18-30) positively influence pro-environmental voting before 2018, indicating strong support for environmental policies among this group. However, post-2018, the influence of younger voters turns negative. Older age groups (46-65 and 66-85) consistently show a significant negative impact, except the 66-85 age group, which shows a positive coefficient after 2018.

Religion might play a role for specific belief groups. Nevertheless, as it is very likely interlinked with other variables, it could be biased dispersion of concentrated allocation of religious groups in certain municipalities (World Jewish Congress, 2024) and also did not show consistent results in the emodels; its importance is questionable.

5 Discussion

Significant factors influence pro-environmental voting behaviour, with a focus on income and age. The findings of the entropy balanced model suggest that higher education is consistently associated with higher pro-environmental voting, aligning with previous research by Baccini and Leemann (2021) and others. This reinforces the understanding that education enhances environmental awareness and civic responsibility.

It was found that income also plays a crucial role, with higher income brackets (>75) showing a positive effect on pro-environmental voting. In contrast, lower income brackets ($\leq$30 and 30-40) tend to have a negative impact. This could be due to higher-income individuals having more resources and opportunities to engage in pro-environmental behaviours and support-related policies, or as not analysed in this work, may be linked with education.

Age shows a clear trend: Younger voters (18-30) exhibit strong pro-environmental voting, while older age groups (46-65 and 66-85) show a significant negative influence. This age-related disparity could be due to differing priorities and exposure to environmental education and mindset among different generations.

The data after 2018, however, is limited, as there are not as many environmental ballots as in the time frame from 1995 to 2018, and must be interpreted cautiously. Events like the COVID-19 pandemic, economic downturns, and political instability may have impacted pro-environmental voting behaviours during this period. Such events can influence public opinion and voter behaviour (Saniuk et al., 2024).

Furthermore, the overall positive effect that was found in this paper to be 7.6% [1] was, in comparison to 20% smaller, as claimed by (Baccini and Leemann, 2021) and calculated by taking the effect size from the entropy balanced model and calculated based on the average pro-climate vote share (41.8%) and the estimated immediate effect of exposure (3.19) to natural disasters. This change in effect could be due to the longer observation period or the change in voting behaviour due to more salient voting issues on the world stage.

[1] immediate effect coefficient (3.19) / Average pro-climate vote share (41.8%) = overall positive effect (0.07631)

Further research is necessary to explore the nuanced relationship between education and income in Switzerland, considering the country's equitable education system. Although education is available to all socio-economic groups, disparities in access and opportunities may affect voting behaviour. Understanding these dynamics is essential for developing targeted policies to enhance pro-environmental engagement across different demographics.

Future research should investigate the interaction between the analysed variables further to develop a thoroughgoing interpretation of the drivers behind pro-environmental voting behaviour in the context of experiencing natural disasters.

5.1 Limitations

This study faced several limitations. The limited post-2018 data may not accurately reflect recent trends in voting behaviour, and significant global events like the COVID-19 pandemic could have influenced the results. The study's temporal scope, from 1995 to 2023, encompasses significant shifts in socio-political and environmental awareness, potentially introducing temporal biases. Additionally, Switzerland, as a very wealthy and stable country, limits the generalisability of the findings to other countries to other countries with different political, social, and environmental contexts.

Multicollinearity among variables such as education, income, and political affiliation might obscure individual effects. Future research should employ advanced statistical techniques to address this issue. Unobserved factors, such as media influence, local environmental campaigns, and personal experiences with environmental issues, could also impact voting behaviour but were not accounted for in this study.

Additionally, pro-/against- environmental voting is not always direct, such as in the case of nuclear power, where further significant influences play a role in the voting. The data quality provided by the WSL and FSO is deemed very high, and no or minimal error is expected. However, the measurement of education, derived from multiple sources, potentially introduces inconsistencies. Furthermore, using defined groups for variables such as age or income may reduce the visibility of the trends. Especially in income, where the brackets defined by the FSO do not represent reality as the median income is around CHF 81'456 p.a. (Domhnall O'Sullivan, 2024), and the brackets should be defined differently for a more detailed analysis.

In summary, while this study offers valuable insights into pro-environmental voting behaviour, these limitations highlight areas for caution and underscore the need for further research to address these issues comprehensively.

5.2 Recommendations for Future Research

The findings from this study lay out several avenues for future research. Extending the analysis period to capture longer-term trends could provide a more comprehensive understanding of voting behaviour related to environmental policies. The data post-2018, limited and potentially influenced by global events like the COVID-19 pandemic and economic downturns, warrants careful consideration in future studies. Further, a detailed socio-demographic analysis examining the interplay between education and income is essential, particularly in understanding how access to education across different socio-economic groups influences environmental voting patterns in Switzerland. The significant impact of age on pro-environmental voting suggests the need for deeper investigation into why older age groups are less inclined to vote for environmental policies. Additionally, exploring variable interaction effects, such as the combined influence of education and income on voting behaviour, could provide more nuanced insights. In other words, these variables shall be considered a prerequisite for municipalities experiencing natural disasters, which should also be the main variable in future research.

5.3 Practical Implications

The study's insights have several practical implications for policymakers and stakeholders. Recognising the significant role of socio-demographic factors can aid in designing targeted environmental campaigns. For instance, campaigns might focus on younger and higher-income individuals who are more supportive of environmental policies. Policymakers should consider the varying impacts of income, age, and education when formulating environmental policies. Tailoring policies to address the concerns and motivations of different demographic groups could enhance public support.

Higher education levels' positive correlation with pro-environmental voting could lead to the conclusion that education and awareness programs should be enhanced to promote future pro-environmental support. Enhancing environmental education across all age groups could foster a more informed and supportive electorate. Given the observed shifts in voting behaviour over time, long-term planning and continuous monitoring are crucial. Policies must adapt to changing public opinions and external influences like global events. Active stakeholders can take into consideration the limited time impact of change in the attitude toward environmental topics after a natural disaster, which occurs the most often during summer.

5.4 Future Research Directions

Future research should extend the time frame to include more recent data, enabling a comprehensive analysis of trends and changes in voting behaviour over time. Further studies should analyse the impact of global events like the COVID-19 pandemic on environmental voting, comparing behaviour during and after such events to understand their influence. Investigating the interplay between education, income, and voting behaviour could uncover underlying mechanisms driving pro-environmental voting.

Research should delve deeper into age-related differences in pro-environmental voting behaviour, understanding why older age groups are less likely to vote for environmental policies and which policies they vote for and/or against. Combining insights from political science, sociology, and environmental studies could provide a more holistic understanding of the factors influencing pro-environmental voting. This interdisciplinary approach could help identify new variables and refine existing models.

Conducting similar studies in different countries could help understand the generalisability of the findings. Comparative analyses could highlight the role of other political systems, cultures, and socio-economic conditions in shaping environmental voting behaviour.

6 Conclusion

The global community sees itself confronted with the the challenges of climate change. Therefore, understanding the supporting drivers for environmental policies has become more important. The conducted analyses provide a further foundation layer for future research and could also provide practical implications for policy makers for promoting sustainable development and action.

By extending Baccini and Leemann (2021)'s research by expanding it with additional twelve years of data, introducing socio-demographic variables and examining temporal windows this work opens new pathways and understandings. Overall the findings confirm the positive impact of natural disasters on pro-environmental voting. Additionally, socio-demographic influencers on voting-patterns in this settins - income and age - could have been found.

Population segments with higher income were positively associated with environmental support, whereas lower income segments displayed a negative influence. Younger voters were more likely to support pro-environmental policies, but this trend reversed after 2018, possibly due to lack of data and/or other external influences not accounted for like the COVID-19 pandemic and economic downturns. The temporal analysis revealed differences in the influence of socio-demographic variables before and after 2018. The differences support the observation that evolving attitudes and recent national and global events influence pro-environmental voting behaviour.

The findings underscore the role of natural disasters, income, and age in shaping environmental attitudes and voting patterns in Switzerland. Policymakers and environmental advocates could apply these insights to design more effective strategies that engage diverse population segments and build support for pro-environmental initiatives.

Although this study offers insights, it is clear that only a few variables influencing pro-environmental voting are known and only were found within the specific setting of municipalities experiencing a natural disaster. Experiencing a natural disaster is one positive influencer, but the complex interplay of various influences will ultimately shape a better tomorrow - hopefully without the need of having to experience a natural disaster. Education, effective communication, and policy design could be the keys for fostering a culture of

pro-environmental stewardship.

Higher education levels and their support for pro-environmental voting outline the importance of education and a general understanding of climate change. Therefore, investing in science based education and implementing sustainability topics in the economic branches of education could be a feasible way to support environmental protection.

Economic policies must also be aligned with environmental goals. For instance, shifting subsidies and financial incentives to green technologies and renewable energy sources could make sustainable choices more accessible to lower-income households and promote a general shift from environmentally unfriendly practices. This approach can mitigate the economic barriers that prevent lower income groups from supporting and benefiting from environmental policies.

Promoting education, effective communication, and inclusive policy design could foster a culture of environmental stewardship, ensuring that future humankind is prepared to address the current environmental challenges.

In conclusion, this extended analysis of pro-environmental voting in Swiss municipalities provides a deeper understanding of how socio-demographic variables and recent events shape environmental attitudes. The study offers insights for policymakers and advocates aiming to foster broad-based support for pro-environmental policies. By leveraging education, addressing economic disparities, and employing targeted communication strategies, a more inclusive and practical approach to pro-environmental support could be created.

As we face the urgent challenges of climate change, these insights will be crucial in guiding the efforts to build a better future.

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Table 6.1: A1: All Votes in Main Analysis

Ballot	Date	Turnout	Yes
Climate Protection and Energy Security (Bundesgesetz über die Ziele im Klimaschutz, die Innovation und die Stärkung der Energiesicherheit (KIG))	18.06.2023	42.5%	59.1%
Greenhouse Gas Reduction Act (Bundesgesetz über die Verminderung von Treibhausgasemissionen (CO2-Gesetz))	13.06.2021	59.7%	48.4%
Energy Act (Energiegesetz (EnG))	21.05.2017	42.9%	58.2%
Sustainable Economy Initiative (Volksinitiative «Für eine nachhaltige und ressourceneffiziente Wirtschaft (Grüne Wirtschaft)»)	25.09.2016	43.0%	36.4%
Energy Instead of VAT (Volksinitiative «Energie- statt Mehrwertsteuer»)	08.03.2015	42.1%	8.0%
End Obstruction Policy Initiative (Volksinitiative «Verbandsbeschwerderecht: Schluss mit der Verhinderungspolitik - Mehr Wachstum für die Schweiz!»)	30.11.2008	47.2%*	66.0%
Expand Highways Counter-Proposal (Gegenentwurf zur Volksinitiative «Avanti - für sichere und leistungsfähige Autobahnen»)	08.02.2004	45.6%*	62.8%
Car-Free Sundays Initiative (Volksinitiative «für einen autofreien Sonntag pro Jahreszeit - ein Versuch für vier Jahre»)	18.05.2003	49.8%	37.6%
Electricity Market Act (Elektrizitätsmarktgesetz)	22.09.2002	44.8%	47.4%
Secure AHV - Tax Energy (Volksinitiative «für eine gesicherte AHV - Energie statt Arbeit besteuern!»)	02.12.2001	37.8%	22.9%
Urban Speed Limit Initiative (Volksinitiative «für mehr Verkehrssicherheit durch Tempo 30 innerorts mit Ausnahmen (Strassen für alle)»)	04.03.2001	55.8%	20.3%
Energy Steering Levy Article (Verfassungsartikel über eine Energielenkungsabgabe für die Umwelt)	24.09.2000	44.9%	44.5%
Renewable Energy Levy Article (Verfassungsartikel über eine Förderabgabe für erneuerbare Energien)	24.09.2000	44.7%	46.6%
Solar Penny Initiative (Volksinitiative «für einen Solarrappen»)	24.09.2000	44.7%	31.8%
Halve Road Traffic Initiative (Volksinitiative «für die Halbierung des motorisierten Strassenverkehrs zur Erhaltung und Verbesserung von Lebensräumen (Verkehrshalbierungs-Initiative)»)	12.03.2000	42.4%	21.3%
Heavy Vehicle Levy Act (Bundesgesetz über eine leistungsabhängige Schwerverkehrsabgabe)	27.09.1998	51.8%	57.2%

*Recoded from NO to YES to represent the pro-environmental outcome of these votes.

Table 6.2: A2: Extended

	Model 1	Model 2	Model 3
Disaster	0.40 ***	0.54 ***	0.40 ***
	(0.14)	(0.14)	(0.14)
Green Party %	0.55 ***		0.55 ***
	(0.02)		(0.02)
Social Democrats %	0.25 ***		0.25 ***
	(0.01)		(0.01)
Christian Democrats %	-0.02 ***		-0.02 ***
	(0.01)		(0.01)
Liberal Democrats %	0.73 ***		0.73 ***
	(0.05)		(0.05)
Swiss People's Party %	-0.01		-0.01
	(0.01)		(0.01)
Rainfall		-284.79	-141.74
		(348.24)	(339.74)
No vegetation		-45.78	-23.04
		(50.08)	(48.84)
Share of Water		3.06	1.31
		(2.11)	(2.06)
Share of Gras		-1.68	-0.87
		(2.03)	(1.98)
Artificial		0.45	0.18
		(0.62)	(0.60)
Intercept	45.27 ***	479.79	258.37
	(1.96)	(521.54)	(508.76)
R^2	0.83	0.82	0.83
Adj. R^2	0.82	0.81	0.82
Num. obs.	40474	40455	40455

Table 6.3: A3: Full

	Model 1	Model 2	Model 3
Disaster	0.35 ***	0.47 ***	0.35 ***
	(0.13)	(0.14)	(0.13)
Green Party %	0.55 ***		0.55 ***
	(0.02)		(0.02)
Social Democrats %	0.28 ***		0.28 ***
	(0.01)		(0.01)
Christian Democrats %	-0.03 ***		-0.03 ***
	(0.01)		(0.01)
Liberal Democrats %	0.71 ***		0.71 ***
	(0.05)		(0.05)
Swiss People's Party %	-0.03 ***		-0.03 ***
	(0.01)		(0.01)
Rainfall		-410.79	-315.62
		(338.10)	(327.13)
No vegetation		-68.19	-52.08
		(48.62)	(47.03)
Share of Water		3.98 *	2.58
		(2.05)	(1.99)
Share of Gras		-2.44	-1.90
		(1.97)	(1.90)
Artificial		0.70	0.52
		(0.60)	(0.58)
Intercept	48.50 ***	671.70	521.75
	(1.88)	(506.34)	(489.87)
R^2	0.86	0.85	0.86
Adj. R^2	0.85	0.84	0.85
Num. obs.	34082	34066	34066

Table 6.4: A4: Average Treatment Effect on the Treated (ATT)

	Estimate	Std. Error	t value	Pr(>|t|)
(Intercept)	38.0797	0.1478	257.6	< 2e-16 ***
treatment1	1.0988	0.2970	3.7	0.000216 ***

Survey design: svydesign(id = ~1, weights = ~weight.L1, data = dat1)

	[,1]	[,2]	[,3]	[,4]	[,5]	[,6]
Flooding Risk	0.58	0.31	0	0.58	0.58	✓
Surface: % No vegetation	4.26	3.23	0	4.26	4.26	✓
Surface: % Water	2.33	1.72	0	2.33	2.33	✓
Surface: % Gras	38.63	45.32	0	38.63	38.63	✓
Surface: % Artificial	17.6	13.79	0	17.6	17.6	✓
Altitude (in m)	570.09	591.56	0	570.09	570.09	✓
Rainfall (per sqkm)	1.71	2.13	0	1.71	1.71	✓
Steepness in %	11.89	9.3	0	11.89	11.89	✓
Social Democrats (%)	17.54	17.04	0	17.54	17.54	✓
Christian Democrats (%)	16.19	15.2	0	16.19	16.19	✓
Greens (%)	6.32	6.69	0	6.32	6.32	✓
Liberals (%)	1.76	1.78	0.51	1.76	1.76	✓
Swiss People's Party (%)	29.42	30.05	0	29.42	29.42	✓

Table 6.5: A5: Heterogeneity in Space

	Model 1	Model 2	Model 3
(Intercept)	38.08 ***	33.64 ***	35.18 ***
	(0.15)	(0.41)	(0.41)
treatment1	1.10 ***	1.33 ***	-2.29 ***
	(0.30)	(0.30)	(0.86)
adata1.btert_share		30.16 ***	19.70 ***
		(2.52)	(2.47)
treatment1:adata1.btert_share			25.34 ***
			(5.58)
Deviance	15785814.92	15655929.04	15633699.73
Dispersion	390.22	387.01	386.46
Num. obs.	40455	40455	40455

Table 6.6: A6: Heterogeneity in Time

	Model V	Model VIII
Constant	38.08 ***	38.08 ***
	(0.15)	(0.15)
Treatment	1.10 ***	3.19 ***
	(0.30)	(0.48)
Time betw. Flood and Vote		-0.32 ***
		(0.07)
Deviance	15785814.92	15762456.46
Dispersion	390.22	389.64
Num. obs.	40455	40455

Table 6.7: A7: Variable Income

	Model 1	Model 2	Model 3
Intercept	53.45 ***	521.75	519.81
	(1.90)	(489.87)	(485.34)
Disaster	0.44 ***	0.35 ***	0.32 **
	(0.14)	(0.13)	(0.13)
Inc. =<30	-0.05 ***		-0.07 ***
	(0.01)		(0.01)
Inc. 30-40	-0.05		-0.05
	(0.04)		(0.04)
Inc. 40-50	-0.07 ***		-0.05 **
	(0.03)		(0.03)
Inc. 50-75	-0.00		-0.00
	(0.01)		(0.01)
Inc. 75<	0.11 ***		0.08 ***
	(0.00)		(0.00)
Green Party %		0.55 ***	0.52 ***
		(0.02)	(0.02)
Social Democrats %		0.28 ***	0.24 ***
		(0.01)	(0.01)
Christian Democrats %		-0.03 ***	-0.04 ***
		(0.01)	(0.01)
Liberal Democrats %		0.71 ***	0.67 ***
		(0.05)	(0.05)
Swiss People's Party %		-0.03 ***	-0.04 ***
		(0.01)	(0.01)
Rainfall		-315.62	-309.02
		(327.13)	(324.10)
No vegetation		-52.08	-54.16
		(47.03)	(46.59)
Share of Water		2.58	1.34
		(1.99)	(1.97)
Share of Gras		-1.90	-1.95
		(1.90)	(1.88)
Artificial		0.52	0.47
		(0.58)	(0.58)
R^2	0.85	0.86	0.86
Adj. R^2	0.84	0.85	0.85
Num. obs.	34082	34066	34066

Table 6.8: A8: Variable Age

	Model 1	Model 2	Model 3
Intercept	116.56 ***	521.75	877.90 *
	(5.54)	(489.87)	(486.74)
Disaster	0.41 ***	0.35 ***	0.31 **
	(0.14)	(0.13)	(0.13)
Age 18-30	0.61 ***		0.36 ***
	(0.07)		(0.06)
Age 31-45	-0.52 ***		-0.59 ***
	(0.09)		(0.09)
Age 46-65	-0.95 ***		-0.93 ***
	(0.07)		(0.06)
Age 66-85	-1.20 ***		-1.08 ***
	(0.07)		(0.07)
Age 86-100	-0.68 ***		-0.41 ***
	(0.16)		(0.16)
Green Party %		0.55 ***	0.51 ***
		(0.02)	(0.02)
Social Democrats %		0.28 ***	0.25 ***
		(0.01)	(0.01)
Christian Democrats %		-0.03 ***	-0.03 ***
		(0.01)	(0.01)
Liberal Democrats %		0.71 ***	0.65 ***
		(0.05)	(0.05)
Swiss People's Party %		-0.03 ***	-0.03 ***
		(0.01)	(0.01)
Rainfall		-315.62	-517.38
		(327.13)	(325.18)
No vegetation		-52.08	-83.24 *
		(47.03)	(46.70)
Share of Water		2.58	3.74 *
		(1.99)	(1.98)
Share of Gras		-1.90	-3.00
		(1.90)	(1.89)
Artificial		0.52	0.87
		(0.58)	(0.58)
R^2	0.85	0.86	0.86
Adj. R^2	0.84	0.85	0.85
Num. obs.	34082	34066	34066

Table 6.9: A9: Variable Education

	Model 1	Model 2	Model 3
Intercept	-1252.34 *	521.75	-4336.58
	(736.39)	(489.87)	(6786.72)
Disaster	0.47 ***	0.35 ***	0.35 ***
	(0.14)	(0.13)	(0.13)
Tertiary	2495.72 *		-3100.75
	(1375.98)		(4579.78)
Tertiary II	1213.75 *		782.03
	(693.09)		(1175.10)
Green Party %		0.55 ***	0.55 ***
		(0.02)	(0.02)
Social Democrats %		0.28 ***	0.28 ***
		(0.01)	(0.01)
Christian Democrats %		-0.03 ***	-0.03 ***
		(0.01)	(0.01)
Liberal Democrats %		0.71 ***	0.71 ***
		(0.05)	(0.05)
Swiss People's Party %		-0.03 ***	-0.03 ***
		(0.01)	(0.01)
Rainfall		-315.62	3677.48
		(327.13)	(5653.19)
No vegetation		-52.08	1126.66
		(47.03)	(1718.96)
Share of Water		2.58	217.20
		(1.99)	(322.65)
Share of Gras		-1.90	-13.94
		(1.90)	(20.21)
Artificial		0.52	-34.14
		(0.58)	(51.49)
R^2	0.85	0.86	0.86
Adj. R^2	0.84	0.85	0.85
Num. obs.	34082	34066	34066

Table 6.10: A10: Variable Gender

	Model 1	Model 2	Model 3
Intercept	48.10 ***	521.75	84.43
	(1.91)	(489.87)	(63.54)
Disaster	0.47 ***	0.35 ***	0.35 ***
	(0.14)	(0.13)	(0.13)
Female Share	13.28 ***		-82.83
	(2.69)		(101.63)
Green Party %		0.55 ***	0.55 ***
		(0.02)	(0.02)
Social Democrats %		0.28 ***	0.28 ***
		(0.01)	(0.01)
Christian Democrats %		-0.03 ***	-0.03 ***
		(0.01)	(0.01)
Liberal Democrats %		0.71 ***	0.71 ***
		(0.05)	(0.05)
Swiss People's Party %		-0.03 ***	-0.03 ***
		(0.01)	(0.01)
Rainfall		-315.62	25.92
		(327.13)	(97.00)
No vegetation		-52.08	12.02
		(47.03)	(33.57)
Share of Water		2.58	4.38
		(1.99)	(4.16)
Share of Gras		-1.90	0.24
		(1.90)	(0.76)
Artificial		0.52	-1.98
		(0.58)	(2.51)
R^2	0.85	0.86	0.86
Adj. R^2	0.84	0.85	0.85
Num. obs.	34082	34066	34066

Table 6.11: A11: Variable Religion

	Model 1	Model 2	Model 3
Intercept	-65.44 **	521.75	27.13
	(32.85)	(489.87)	(31.17)
Disaster	0.47 ***	0.35 ***	0.35 ***
	(0.14)	(0.13)	(0.13)
Protestant	0.67 ***		-0.02
	(0.15)		(0.13)
Catholic Roman	0.59 ***		0.14
	(0.20)		(0.14)
Catholic Christian	11.52		-3.61
	(12.60)		(5.02)
Catholic Orthodox	-6.35		1.17
	(13.02)		(3.90)
Catholic Other	10.21 *		4.55
	(6.01)		(6.24)
Jewish	-18.62		56.69 **
	(47.60)		(23.17)
Muslim	11.30 ***		1.37
	(3.54)		(2.22)
Religion Other	2.58		0.77
	(7.78)		(3.56)
Atheist	0.25		-0.18
	(0.18)		(0.18)
Green Party %		0.55 ***	0.55 ***
		(0.02)	(0.02)
Social Democrats %		0.28 ***	0.28 ***
		(0.01)	(0.01)
Christian Democrats %		-0.03 ***	-0.03 ***
		(0.01)	(0.01)
Liberal Democrats %		0.71 ***	0.71 ***
		(0.05)	(0.05)
Swiss People's Party %		-0.03 ***	-0.03 ***
		(0.01)	(0.01)
Rainfall		-315.62	-8.37
		(327.13)	(7.48)
No vegetation		-52.08	-1.38 *
		(47.03)	(0.80)
Share of Water		2.58	1.88
		(1.99)	(1.17)
Share of Gras		-1.90	0.04
		(1.90)	(0.12)
Artificial		0.52	0.12
		(0.58)	(0.11)
R^2	0.85	0.86	0.86
Adj. R^2	0.84	0.85	0.85
Num. obs.	34082	34066	34066

Table 6.12: A12: Variable Damage Extent

	Model 1	Model 2	Model 3
Intercept	61.38 ***	521.75	522.20
	(1.91)	(489.87)	(489.87)
Disaster	0.45 ***	0.35 ***	0.36 **
	(0.14)	(0.13)	(0.14)
Damage Extent 2	0.56		0.17
	(0.43)		(0.41)
Damage Extent 3	-0.76		-0.78
	(0.67)		(0.65)
Green Party %		0.55 ***	0.55 ***
		(0.02)	(0.02)
Social Democrats %		0.28 ***	0.28 ***
		(0.01)	(0.01)
Christian Democrats %		-0.03 ***	-0.03 ***
		(0.01)	(0.01)
Liberal Democrats %		0.71 ***	0.71 ***
		(0.05)	(0.05)
Swiss People's Party %		-0.03 ***	-0.03 ***
		(0.01)	(0.01)
Rainfall		-315.62	-315.93
		(327.13)	(327.13)
No vegetation		-52.08	-52.12
		(47.03)	(47.03)
Share of Water		2.58	2.58
		(1.99)	(1.99)
Share of Gras		-1.90	-1.90
		(1.90)	(1.90)
Artificial		0.52	0.52
		(0.58)	(0.58)
R^2	0.85	0.86	0.86
Adj. R^2	0.84	0.85	0.85
Num. obs.	34082	34066	34066

Table 6.13: A13: Variable Income: after 2018-08-20

	Model 1	Model 2	Model 3
Intercept	85.20 **	246.76	265.31
	(37.38)	(177.88)	(182.84)
Disaster	0.20	0.19	0.20
	(0.27)	(0.27)	(0.27)
Inc. =<30	-0.58		-0.57
	(0.45)		(0.45)
Inc. 30-40	-0.84 *		-0.83 *
	(0.47)		(0.47)
Inc. 40-50	-0.51		-0.51
	(0.46)		(0.46)
Inc. 50-75	-0.01		-0.00
	(0.46)		(0.46)
Inc. 75<	-0.23		-0.23
	(0.47)		(0.47)
Green Party %		0.89	0.47
		(0.81)	(0.96)
Social Democrats %		-1.79	-1.43
		(1.50)	(1.61)
Christian Democrats %		-1.62	-2.22
		(1.67)	(1.77)
Liberal Democrats %		-8.07	-12.89
		(6.90)	(8.52)
Swiss People's Party %		-0.47	2.11
		(0.50)	(2.21)
Rainfall		-54.66 *	-7.97
		(33.10)	(53.12)
No vegetation		-5.53 *	-2.95
		(2.97)	(3.69)
Share of Water		-6.36	-15.38
		(8.39)	(13.31)
Share of Gras		-0.44	-1.58
		(0.78)	(1.15)
Artificial		-0.69	-1.06
		(0.85)	(1.04)
R^2	0.94	0.94	0.94
Adj. R^2	0.87	0.87	0.87
Num. obs.	4264	4262	4262

Table 6.14: A14: Variable Age: after 2018-08-20

	Model 1	Model 2	Model 3
Intercept	81.39 ***	246.76	304.74 *
	(16.21)	(177.88)	(178.56)
Disaster	0.10	0.19	0.10
	(0.27)	(0.27)	(0.27)
Age 18-30	-0.52 ***		-0.52 ***
	(0.19)		(0.19)
Age 31-45	-0.15		-0.15
	(0.26)		(0.26)
Age 46-65	-0.67 ***		-0.67 ***
	(0.21)		(0.21)
Age 66-85	0.71 ***		0.71 ***
	(0.22)		(0.22)
Age 86-100	0.76 *		0.76 *
	(0.45)		(0.45)
Green Party %		0.89	0.76
		(0.81)	(0.83)
Social Democrats %		-1.79	-2.19
		(1.50)	(1.51)
Christian Democrats %		-1.62	-2.21
		(1.67)	(1.68)
Liberal Democrats %		-8.07	-9.48
		(6.90)	(6.96)
Swiss People's Party %		-0.47	-0.73
		(0.50)	(0.50)
Rainfall		-54.66 *	-63.08 *
		(33.10)	(33.58)
No vegetation		-5.53 *	-6.93 **
		(2.97)	(3.04)
Share of Water		-6.36	-7.46
		(8.39)	(8.45)
Share of Gras		-0.44	-0.42
		(0.78)	(0.78)
Artificial		-0.69	-0.77
		(0.85)	(0.85)
R^2	0.94	0.94	0.94
Adj. R^2	0.88	0.87	0.88
Num. obs.	4264	4262	4262

Table 6.15: A15: Variable Education: after 2018-08-20

	Model 1	Model 2	Model 3
Intercept	-946.15	246.76	165.85 *
	(805.43)	(177.88)	(98.26)
Disaster	0.19	0.19	0.19
	(0.27)	(0.27)	(0.27)
Edu MATURA	-1370.16		-154.64
	(1176.53)		(145.34)
Edu TERTIARY	1896.19		-19.61
	(1547.62)		(46.82)
Green Party %		0.89	1.47 **
		(0.81)	(0.63)
Social Democrats %		-1.79	-0.63
		(1.50)	(0.69)
Christian Democrats %		-1.62	0.86 *
		(1.67)	(0.52)
Liberal Democrats %		-8.07	-1.66
		(6.90)	(2.07)
Swiss People's Party %		-0.47	-0.17
		(0.50)	(0.71)
Rainfall		-54.66 *	-79.79 **
		(33.10)	(39.30)
No vegetation		-5.53 *	-5.76 **
		(2.97)	(2.54)
Share of Water		-6.36	10.42 **
		(8.39)	(4.57)
Share of Gras		-0.44	-0.25
		(0.78)	(0.48)
Artificial		-0.69	-0.08
		(0.85)	(0.32)
R^2	0.94	0.94	0.94
Adj. R^2	0.87	0.87	0.87
Num. obs.	4264	4262	4262

Table 6.16: A16: Variable Gender: after 2018-08-20

	Model 1	Model 2	Model 3
Intercept	48.83 ***	246.76	180.51
	(3.07)	(177.88)	(259.74)
Disaster	0.19	0.19	0.19
	(0.27)	(0.27)	(0.27)
Female Share	11.88 ***		11.51
	(4.33)		(22.84)
Green Party %		0.89	1.08
		(0.81)	(1.00)
Social Democrats %		-1.79	-1.22
		(1.50)	(2.16)
Christian Democrats %		-1.62	-1.10
		(1.67)	(2.26)
Liberal Democrats %		-8.07	-6.42
		(6.90)	(8.83)
Swiss People's Party %		-0.47	-0.03
		(0.50)	(0.69)
Rainfall		-54.66 *	-43.47
		(33.10)	(45.48)
No vegetation		-5.53 *	-5.11
		(2.97)	(3.42)
Share of Water		-6.36	-4.73
		(8.39)	(10.17)
Share of Gras		-0.44	-0.47
		(0.78)	(0.75)
Artificial		-0.69	-0.38
		(0.85)	(1.26)
R^2	0.94	0.94	0.94
Adj. R^2	0.87	0.87	0.87
Num. obs.	4264	4262	4262

Table 6.17: A17: Variable Religion: after 2018-08-20

	Model 1	Model 2	Model 3
Intercept	-29.19	246.76	-193.95 **
	(53.01)	(177.88)	(77.98)
Disaster	0.19	0.19	0.19
	(0.27)	(0.27)	(0.27)
Protestant	0.59 **		-0.23
	(0.25)		(0.31)
Catholic Roman	0.35		-0.08
	(0.32)		(0.26)
Catholic Christian	-13.15		8.47 **
	(20.33)		(4.00)
Catholic Orthodox	20.10		8.59 **
	(21.02)		(3.95)
Catholic Other	5.05		-8.12
	(9.70)		(7.70)
Jewish	-67.96		37.78 ***
	(76.80)		(9.11)
Muslim	7.21		0.47
	(5.71)		(4.64)
Religion Other	19.61		0.96
	(12.56)		(6.64)
Atheist	0.41		0.23
	(0.30)		(0.25)
Green Party %		0.89	4.00 ***
		(0.81)	(0.81)
Social Democrats %		-1.79	1.88 ***
		(1.50)	(0.41)
Christian Democrats %		-1.62	1.31 ***
		(1.67)	(0.40)
Liberal Democrats %		-8.07	2.70 *
		(6.90)	(1.60)
Swiss People's Party %		-0.47	0.97 **
		(0.50)	(0.43)
Rainfall		-54.66 *	36.94 ***
		(33.10)	(14.16)
No vegetation		-5.53 *	-1.26
		(2.97)	(1.27)
Share of Water		-6.36	5.86 ***
		(8.39)	(2.19)
Share of Gras		-0.44	1.24 ***
		(0.78)	(0.39)
Artificial		-0.69	0.90 **
		(0.85)	(0.40)
R^2	0.94	0.94	0.94
Adj. R^2	0.87	0.87	0.87
Num. obs.	4264	4262	4262

Table 6.18: A18: Variable Damage Extent: after 2018-08-20

	Model 1	Model 2	Model 3
Intercept	60.71 ***	246.76	246.76
	(3.07)	(177.88)	(177.92)
Disaster	0.19	0.19	0.19
	(0.27)	(0.27)	(0.27)
Damage Extent 2	0.60		0.60
	(1.38)		(1.38)
Damage Extent 3	-3.50		-3.51
	(4.34)		(4.34)
Green Party %		0.89	0.89
		(0.81)	(0.81)
Social Democrats %		-1.79	-1.79
		(1.50)	(1.50)
Christian Democrats %		-1.62	-1.62
		(1.67)	(1.67)
Liberal Democrats %		-8.07	-8.07
		(6.90)	(6.91)
Swiss People's Party %		-0.47	-0.47
		(0.50)	(0.50)
Rainfall		-54.66 *	-54.65 *
		(33.10)	(33.11)
No vegetation		-5.53 *	-5.53 *
		(2.97)	(2.97)
Share of Water		-6.36	-6.36
		(8.39)	(8.39)
Share of Gras		-0.44	-0.44
		(0.78)	(0.78)
Artificial		-0.69	-0.69
		(0.85)	(0.85)
R^2	0.94	0.94	0.94
Adj. R^2	0.87	0.87	0.87
Num. obs.	4264	4262	4262

Table 6.19: A19: Variable Income: before 2018-08-20

	Model 1	Model 2	Model 3
Intercept	56.30 ***	556.71	553.51
	(2.03)	(520.87)	(518.37)
Disaster	0.12	0.05	0.07
	(0.15)	(0.15)	(0.15)
Inc. =<30	-0.28 ***		-0.32 ***
	(0.06)		(0.06)
Inc. 30-40	0.04		0.02
	(0.04)		(0.04)
Inc. 40-50	-0.05 *		-0.03
	(0.03)		(0.03)
Inc. 50-75	0.02		0.03 **
	(0.02)		(0.02)
Inc. 75<	0.09 ***		0.06 ***
	(0.01)		(0.01)
Green Party %		0.38 ***	0.35 ***
		(0.02)	(0.02)
Social Democrats %		0.28 ***	0.25 ***
		(0.01)	(0.01)
Christian Democrats %		-0.04 ***	-0.05 ***
		(0.01)	(0.01)
Liberal Democrats %		0.78 ***	0.74 ***
		(0.05)	(0.05)
Swiss People's Party %		0.02 **	0.01
		(0.01)	(0.01)
Rainfall		-336.29	-330.94
		(347.84)	(346.17)
No vegetation		-54.36	-55.92
		(50.00)	(49.76)
Share of Water		2.56	1.60
		(2.11)	(2.11)
Share of Gras		-2.03	-2.07
		(2.02)	(2.01)
Artificial		0.55	0.51
		(0.62)	(0.61)
R^2	0.87	0.87	0.87
Adj. R^2	0.86	0.86	0.86
Num. obs.	29818	29804	29804

Table 6.20: A20: Variable Age: before 2018-08-20

	Model 1	Model 2	Model 3
Intercept	87.64 ***	556.71	908.55 *
	(7.84)	(520.87)	(521.42)
Disaster	0.12	0.05	0.07
	(0.15)	(0.15)	(0.15)
Age 18-30	1.07 ***		0.81 ***
	(0.10)		(0.09)
Age 31-45	0.16		0.02
	(0.13)		(0.13)
Age 46-65	-0.60 ***		-0.63 ***
	(0.10)		(0.10)
Age 66-85	-1.14 ***		-1.02 ***
	(0.11)		(0.11)
Age 86-100	-1.05 ***		-0.88 ***
	(0.23)		(0.23)
Green Party %		0.38 ***	0.35 ***
		(0.02)	(0.02)
Social Democrats %		0.28 ***	0.25 ***
		(0.01)	(0.01)
Christian Democrats %		-0.04 ***	-0.05 ***
		(0.01)	(0.01)
Liberal Democrats %		0.78 ***	0.72 ***
		(0.05)	(0.05)
Swiss People's Party %		0.02 **	0.02 **
		(0.01)	(0.01)
Rainfall		-336.29	-549.32
		(347.84)	(348.53)
No vegetation		-54.36	-86.29 *
		(50.00)	(50.00)
Share of Water		2.56	3.41
		(2.11)	(2.14)
Share of Gras		-2.03	-3.28
		(2.02)	(2.02)
Artificial		0.55	0.84
		(0.62)	(0.62)
R^2	0.87	0.87	0.87
Adj. R^2	0.86	0.86	0.86
Num. obs.	29818	29804	29804

Table 6.21: A21: Variable Education: before 2018-08-20

	Model 1	Model 2	Model 3
Intercept	-1234.95	556.71	-3400.59
	(773.30)	(520.87)	(7217.82)
Disaster	0.10	0.05	0.05
	(0.15)	(0.15)	(0.15)
Tertiary	2470.42 *		-2463.66
	(1444.96)		(4870.71)
Tert II	1199.43 *		618.61
	(727.84)		(1249.75)
Green Party %		0.38 ***	0.38 ***
		(0.02)	(0.02)
Social Democrats %		0.28 ***	0.28 ***
		(0.01)	(0.01)
Christian Democrats %		-0.04 ***	-0.04 ***
		(0.01)	(0.01)
Liberal Democrats %		0.78 ***	0.78 ***
		(0.05)	(0.05)
Swiss People's Party %		0.02 **	0.02 **
		(0.01)	(0.01)
Rainfall		-336.29	2899.51
		(347.84)	(6012.30)
No vegetation		-54.36	889.06
		(50.00)	(1828.15)
Share of Water		2.56	172.12
		(2.11)	(343.15)
Share of Gras		-2.03	-11.10
		(2.02)	(21.50)
Artificial		0.55	-27.00
		(0.62)	(54.76)
R^2	0.86	0.87	0.87
Adj. R^2	0.85	0.86	0.86
Num. obs.	29818	29804	29804

Table 6.22: A22: Variable Gender: before 2018-08-20

	Model 1	Model 2	Model 3
Intercept	50.80 ***	556.71	71.87
	(2.00)	(520.87)	(67.58)
Disaster	0.10	0.05	0.05
	(0.15)	(0.15)	(0.15)
Female Share	13.61 ***		-91.83
	(2.82)		(108.07)
Green Party %		0.38 ***	0.38 ***
		(0.02)	(0.02)
Social Democrats %		0.28 ***	0.28 ***
		(0.01)	(0.01)
Christian Democrats %		-0.04 ***	-0.04 ***
		(0.01)	(0.01)
Liberal Democrats %		0.78 ***	0.78 ***
		(0.05)	(0.05)
Swiss People's Party %		0.02 **	0.02 **
		(0.01)	(0.01)
Rainfall		-336.29	42.38
		(347.84)	(103.15)
No vegetation		-54.36	16.70
		(50.00)	(35.70)
Share of Water		2.56	4.56
		(2.11)	(4.42)
Share of Gras		-2.03	0.35
		(2.02)	(0.81)
Artificial		0.55	-2.22
		(0.62)	(2.67)
R^2	0.86	0.87	0.87
Adj. R^2	0.85	0.86	0.86
Num. obs.	29818	29804	29804

Table 6.23: A23: Variable Religion: before 2018-08-20

	Model 1	Model 2	Model 3
Intercept	-68.22 **	556.71	46.63
	(34.50)	(520.87)	(33.14)
Disaster	0.10	0.05	0.05
	(0.15)	(0.15)	(0.15)
Protestant	0.69 ***		-0.09
	(0.16)		(0.14)
Catholic Roman	0.62 ***		0.07
	(0.21)		(0.15)
Catholic Christian	14.99		-4.42
	(13.23)		(5.34)
Catholic Orthodox	-10.04		-0.06
	(13.68)		(4.15)
Catholic Other	11.11 *		0.70
	(6.31)		(6.64)
Jewish	-11.60		48.56 **
	(49.98)		(24.64)
Muslim	11.93 ***		0.63
	(3.72)		(2.36)
Religion Other	0.03		1.50
	(8.17)		(3.79)
Atheist	0.23		-0.15
	(0.19)		(0.20)
Green Party %		0.38 ***	0.38 ***
		(0.02)	(0.02)
Social Democrats %		0.28 ***	0.28 ***
		(0.01)	(0.01)
Christian Democrats %		-0.04 ***	-0.04 ***
		(0.01)	(0.01)
Liberal Democrats %		0.78 ***	0.78 ***
		(0.05)	(0.05)
Swiss People's Party %		0.02 **	0.02 **
		(0.01)	(0.01)
Rainfall		-336.29	-7.99
		(347.84)	(7.96)
No vegetation		-54.36	-0.99
		(50.00)	(0.86)
Share of Water		2.56	2.43 *
		(2.11)	(1.24)
Share of Gras		-2.03	-0.00
		(2.02)	(0.12)
Artificial		0.55	0.05
		(0.62)	(0.12)
R^2	0.86	0.87	0.87
Adj. R^2	0.85	0.86	0.86
Num. obs.	29818	29804	29804

Table 6.24: A24: Variable Damage Extent: before 2018-08-20

	Model 1	Model 2	Model 3
Intercept	64.41 ***	556.71	556.98
	(2.00)	(520.87)	(520.88)
Disaster	0.07	0.05	0.04
	(0.16)	(0.15)	(0.15)
Damage Extent 2	0.58		0.28
	(0.44)		(0.43)
Damage Extent 3	-0.54		-0.50
	(0.67)		(0.66)
Green Party %		0.38 ***	0.38 ***
		(0.02)	(0.02)
Social Democrats %		0.28 ***	0.28 ***
		(0.01)	(0.01)
Christian Democrats %		-0.04 ***	-0.04 ***
		(0.01)	(0.01)
Liberal Democrats %		0.78 ***	0.78 ***
		(0.05)	(0.05)
Swiss People's Party %		0.02 **	0.02 **
		(0.01)	(0.01)
Rainfall		-336.29	-336.47
		(347.84)	(347.84)
No vegetation		-54.36	-54.39
		(50.00)	(50.00)
Share of Water		2.56	2.57
		(2.11)	(2.11)
Share of Gras		-2.03	-2.03
		(2.02)	(2.02)
Artificial		0.55	0.55
		(0.62)	(0.62)
R^2	0.86	0.87	0.87
Adj. R^2	0.85	0.86	0.86
Num. obs.	29818	29804	29804

Table 6.25: A25: All Variables

	Model 1	Model 2	Model 3
Intercept	742.50 **	521.75	91.17 **
	(290.72)	(489.87)	(38.46)
Disaster	0.37 ***	0.35 ***	0.29 **
	(0.14)	(0.13)	(0.14)
Inc. =<30	-0.03 ***		-0.05 ***
	(0.01)		(0.01)
Inc. 30-40	-0.06 *		-0.07 **
	(0.04)		(0.04)
Inc. 40-50	-0.06 **		-0.04
	(0.03)		(0.03)
Inc. 50-75	-0.01		-0.01
	(0.01)		(0.01)
Inc. 75<	0.10 ***		0.08 ***
	(0.00)		(0.00)
Age 18-30	0.61 ***		0.39 ***
	(0.06)		(0.06)
Age 31-45	-0.33 ***		-0.44 ***
	(0.09)		(0.09)
Age 46-65	-0.82 ***		-0.83 ***
	(0.07)		(0.06)
Age 66-85	-0.98 ***		-0.87 ***
	(0.07)		(0.07)
Age 86-100	-0.43 ***		-0.30 *
	(0.16)		(0.16)
Tertiary	4396.81 ***		19.27
	(1686.68)		(33.53)
Tert II	76.68 ***		-2.13
	(25.03)		(4.09)
Female	219.38 **		-3.20
	(87.63)		(14.83)
Protestant	-7.30 **		-0.03
	(2.89)		(0.14)
Catholic Roman	-7.41 **		0.19
	(3.07)		(0.25)
Catholic Christian	7.37		-2.62
	(7.60)		(6.68)
Catholic Orthodox	-135.15 **		0.58
	(54.08)		(3.04)
Catholic Other	-519.27 **		17.90
	(210.72)		(12.74)
Jewish	-781.24 **		93.88 *
	(357.19)		(47.93)
Muslim	34.66 ***		-1.29
	(11.01)		(4.47)
Religion Other	-242.83 ***		-7.47
	(85.14)		(7.62)
Atheist	-3.40 ***		-0.54 **
	(1.16)		(0.25)
Damage Extent 2	0.61		0.28
	(0.42)		(0.41)
Damage Extent 3	-0.69		-0.72
	(0.66)		(0.64)
Green Party %		0.55 ***	0.49 ***
		(0.02)	(0.02)
Social Democrats %		0.28 ***	0.23 ***
		(0.01)	(0.01)
Christian Democrats %		-0.03 ***	-0.05 ***
		(0.01)	(0.01)
Liberal Democrats %		0.71 ***	0.62 ***
		(0.05)	(0.05)
Swiss People's Party %		-0.03 ***	-0.03 ***
		(0.01)	(0.01)
Rainfall		-315.62	-16.96 ***
		(327.13)	(5.89)
No vegetation		-52.08	-1.31
		(47.03)	(0.82)
Share of Water		2.58	-0.87
		(1.99)	(1.14)
Share of Gras		-1.90	-0.11
		(1.90)	(0.22)
Artificial		0.52	0.02
		(0.58)	(0.48)
R^2	0.86	0.86	0.87
Adj. R^2	0.85	0.85	0.86
Num. obs.	34082	34066	34066

Table 6.26: A26: All Variables: before 2018-08-20

	Model 1	Model 2	Model 3
Intercept	811.60 ***	556.71	87.44 **
	(310.10)	(520.87)	(41.62)
Disaster	0.11	0.05	0.08
	(0.15)	(0.15)	(0.15)
Inc. =<30	-0.29 ***		-0.32 ***
	(0.06)		(0.06)
Inc. 30-40	0.04		0.02
	(0.04)		(0.04)
Inc. 40-50	-0.04		-0.02
	(0.03)		(0.03)
Inc. 50-75	0.02		0.03 *
	(0.02)		(0.02)
Inc. 75<	0.08 ***		0.06 ***
	(0.01)		(0.01)
Age 18-30	1.07 ***		0.85 ***
	(0.09)		(0.09)
Age 31-45	0.31 **		0.15
	(0.13)		(0.13)
Age 46-65	-0.46 ***		-0.52 ***
	(0.10)		(0.10)
Age 66-85	-0.97 ***		-0.89 ***
	(0.11)		(0.11)
Age 86-100	-0.66 ***		-0.56 **
	(0.23)		(0.23)
Tertiary	4953.76 ***		-7.22
	(1800.46)		(36.05)
Tert II	86.97 ***		-3.43
	(26.66)		(4.38)
Female	249.42 ***		-0.24
	(93.57)		(15.90)
Protestant	-8.33 ***		-0.06
	(3.09)		(0.15)
Catholic Roman	-8.42 **		0.15
	(3.28)		(0.26)
Catholic Christian	6.92		-1.51
	(8.12)		(7.18)
Catholic Orthodox	-153.10 ***		0.43
	(57.78)		(3.27)
Catholic Other	-587.26 ***		19.57
	(224.98)		(13.66)
Jewish	-872.31 **		107.03 **
	(381.84)		(51.53)
Muslim	37.67 ***		-4.38
	(11.72)		(4.80)
Religion Other	-282.21 ***		-10.31
	(90.79)		(8.18)
Atheist	-3.82 ***		-0.71 ***
	(1.24)		(0.27)
Damage Extent 2	0.53		0.28
	(0.43)		(0.42)
Damage Extent 3	-0.55		-0.51
	(0.66)		(0.65)
Green Party %		0.38 ***	0.32 ***
		(0.02)	(0.02)
Social Democrats %		0.28 ***	0.23 ***
		(0.01)	(0.01)
Christian Democrats %		-0.04 ***	-0.06 ***
		(0.01)	(0.01)
Liberal Democrats %		0.78 ***	0.68 ***
		(0.05)	(0.05)
Swiss People's Party %		0.02 **	0.01 *
		(0.01)	(0.01)
Rainfall		-336.29	-23.62 ***
		(347.84)	(6.33)
No vegetation		-54.36	-1.88 **
		(50.00)	(0.88)
Share of Water		2.56	-1.61
		(2.11)	(1.23)
Share of Gras		-2.03	-0.09
		(2.02)	(0.24)
Artificial		0.55	0.14
		(0.62)	(0.52)
R^2	0.87	0.87	0.87
Adj. R^2	0.86	0.86	0.86
Num. obs.	29818	29804	29804

Table 6.27: A27: All Variables: after 2018-08-20

	Model 1	Model 2	Model 3
Intercept	1398.63 **	246.76	-285.96
	(682.25)	(177.88)	(1634.71)
Disaster	0.12	0.19	0.12
	(0.27)	(0.27)	(0.27)
Inc. =<30	-0.55		-0.55
	(0.45)		(0.45)
Inc. 30-40	-0.73		-0.73
	(0.46)		(0.46)
Inc. 40-50	-0.56		-0.56
	(0.45)		(0.45)
Inc. 50-75	-0.02		-0.02
	(0.45)		(0.45)
Inc. 75<	-0.24		-0.24
	(0.46)		(0.46)
Age 18-30	-0.52 ***		-0.52 ***
	(0.19)		(0.19)
Age 31-45	-0.15		-0.15
	(0.26)		(0.26)
Age 46-65	-0.67 ***		-0.67 ***
	(0.21)		(0.21)
Age 66-85	0.71 ***		0.71 ***
	(0.22)		(0.22)
Age 86-100	0.74		0.74
	(0.45)		(0.45)
Tertiary	7967.88 **		-13.68
	(3929.70)		(400.02)
Tert II	119.39 **		-84.47
	(55.22)		(212.27)
Female	371.45 *		-17.30
	(223.96)		(82.66)
Protestant	-13.50 **		-1.18
	(6.58)		(1.20)
Catholic Roman	-13.85 *		-0.77
	(7.37)		(0.63)
Catholic Christian	-10.96		52.46
	(28.55)		(79.67)
Catholic Orthodox	-250.02 **		-46.41
	(122.97)		(94.85)
Catholic Other	-959.98 *		55.82
	(504.41)		(195.68)
Jewish	-1497.13		-39.19
	(963.14)		(57.24)
Muslim	59.87 **		-35.93
	(27.52)		(67.67)
Religion Other	-423.39 **		-25.20
	(170.29)		(23.18)
Atheist	-5.72 **		0.94
	(2.50)		(5.63)
Damage Extent 2	0.43		0.43
	(1.37)		(1.37)
Damage Extent 3	-4.69		-4.69
	(4.30)		(4.30)
Green Party %		0.89	11.09
		(0.81)	(27.74)
Social Democrats %		-1.79	6.02
		(1.50)	(17.14)
Christian Democrats %		-1.62	3.21
		(1.67)	(9.05)
Liberal Democrats %		-8.07	8.32
		(6.90)	(38.86)
Swiss People's Party %		-0.47	0.75
		(0.50)	(3.62)
Rainfall		-54.66 *	144.94
		(33.10)	(469.60)
No vegetation		-5.53 *	8.24
		(2.97)	(26.27)
Share of Water		-6.36	-1.42
		(8.39)	(16.74)
Share of Gras		-0.44	1.75
		(0.78)	(6.08)
Artificial		-0.69	0.93
		(0.85)	(2.10)
R^2	0.94	0.94	0.94
Adj. R^2	0.88	0.87	0.88
Num. obs.	4264	4262	4262