

Hurricanes, Climate Change and Electoral Accountability

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Preliminary: suggestions welcome

- There is almost unanimous consensus among scientists that **climate change is occurring**, and it is **caused largely by human activity** (ICCP, 2013 Report).
 - However, many experts think that current policies are below optimal level.
- ▶ Failures
- William Nordhaus (January 2017): “When taking uncertainties into account, the strength of policy (as measured by the social cost of carbon or the optimal carbon tax) would increase, not decrease.”

- **How do politicians respond to** new information on **climate change threats**?
- Do US House members initiate and support more **environmental legislation** aimed at fighting climate change **in the aftermath of hurricanes** that hit their districts?
 - Exploit random nature of hurricane path for identification, and within-district variation over time in hurricane incidence.
- Do voters **reward** politicians for supporting green bills in terms of campaign funds and re-election?
- Ultimately, learn more about the **demand for public policy** and **political accountability**.

Hurricanes and Climate Change

- Scientific community actually cautious about linking causally **global climate change and hurricanes**.
- Many studies have found link between experience with extreme weather events and belief in global warming.
- Anecdotal evidence: Michael Bloomberg endorsed Obama in 2012 elections after Hurricane Sandy, citing climate change and calling for action.

Preview of the Results

- 1 Strong and robust evidence that politicians sponsor and cosponsor more “green” bills in the first year after a hurricane hit their district.
- 2 Event study analysis: Effect fades away after one year.
- 3 Reaction kicks in only when direct experience, not information from neighboring districts.
- 4 Evidence of a negative effect of more green bills on reelection probability and campaign contributions.

Outline of the Talk

- Literature review.
- Econometric model and Data.
- Results.
 - Baseline, Robustness and Placebo.
 - Event Study Analysis.
 - Heterogeneity.
 - Bill outcomes.
- Spillover effects.
- Electoral outcomes.

- Experienced weather events and beliefs about climate change.
 - Leiserowitz (2006), Myers et al. (2012), Borick and Rabe (2010) Joireman et al. (2010), Li et al. (2011), Akerlof et al. (2013), Borick (2014), Lang (2014), Zaval et al. (2014), Konisky (2016), Land and Ryder (2016), Shao and Goidel (2016), Demski (2017), Dai et al. (2015), Blennow et al. (2015), Frondel et al. (2017).
- Economic impact of weather events.
 - Barrot and Sauvagnat (2014), Dessaint and Matray (2015), Deryugina (2011), Deryugina et al. (2017), Hsiang and Jina (2017), Wang et al. (2017).
- Information and political accountability.
 - Besley and Burgess (2002), Lupia and McCubbins (1998), Bartels (1996), Ashworth and Bueno de Mesquita (2014), Levy and Razin (2015, 2016), Achen and Bartels (2004), Wolfers (2009), Leigh (2009), Healy, Malhotra, and Mo (2010), Huber, Hill, and Lenz (2012), Lau and Redlawsk (2001).
- Experienced weather events and policy making.
 - Gasper and Reeves (2011), Healy and Malhotra (2009, 2010), Cole et al. (2012), Bechtel and Hainmueller (2011), Chen (2013), Rudman et al. (2013), Kahn (2007).

► YCOM Survey

Econometric Specification

- Basic empirical specification:

$$\text{cospgreen}_{sdi,t} = \alpha + \beta H_{sdi,\tau} + \gamma' X_{sdi,t} + \delta_t + \mu_z + \epsilon_{sdi,t} \quad (1)$$

- $\text{cospgreen}_{sdi,t}$: number of green bills sponsored or cosponsored by congress member i , from district d in state s , at time t .
- $H_{sdi,\tau}$: hurricane incidence in district d at time τ ($\tau = t, t - 1$)
- $X_{sdi,t}$: vector of district (demographic and economic characteristics, electoral controls, fossil production) and congress member controls (party, leadership, age, gender, other legislative activity).
- δ_t : Year effects.
- μ_z : Geographic or individual congress member fixed effects.

- Different geographic fixed effects imply different source of identification.
- State fixed effects: exploit random path of hurricane **within a state** and over time.
 - A hurricane can hit Northern Florida, but miss Miami.
- District fixed effects: exploit variation over time **within a congressional district**.

Data and Variables 1: Green Bills

- Data on sponsorship and cosponsorship of all bills from Library of Congress, 101-113th Congress (1989-2014).
- Identify as “green” bills classified by Congressional Bills Project (CBP) as minor category:
 - “Air pollution, Global Warming, and Noise Pollution”
 - “Alternative and Renewable Energy”
- Dependent variable: number of green bills sponsored or cosponsored.
- Pros and cons:
 - Pro: A subset of all bills in the Environmental and Energy categories, excludes waste management, clean water, etc.
 - Pro: **Excludes bills that divert funds** to disaster areas, on noise pollution, or that are actually anti-environmental (with text analysis).
 - Con: May miss important legislation that does not fall into this category (e.g., ratifying international agreements)

Data and Variables 1: Green Bills

- Alternative: list of climate change legislation provided by C2ES (from 106th Congress onwards).
- Pros and cons:
 - Pro: Identify bills that are clearly addressing climate change.
 - Pro: Not restricted to specific categories.
 - Pro: Mostly “major” bills.
 - Pro: **Excludes bills that divert funds** to disaster areas (with text analysis).
 - Con: shorter time period.

Data and Variables 2: Hurricanes

- Data from FEMA on county-level assistance, 1953-2014.
- Only disasters caused by hurricanes (tropical storms in the Atlantic Ocean and northeastern Pacific Ocean).
- Baseline: all disasters. Robustness: only Major Disaster Declarations.
- Also info on wind speed, to create “objective” measure of hurricane incidence.

Randomness of Hurricanes

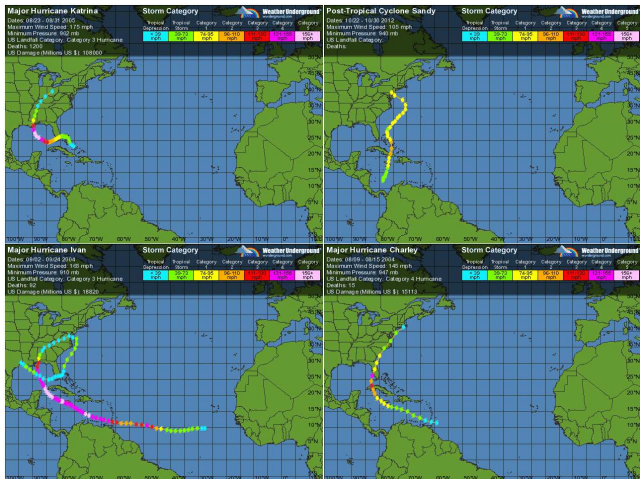


Table 1: Balancing Tests

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
District:	Pop. (log)	Income (log)	Land area (log)	Over 65 (share)	Black (share)	Foreign (share)	Urban (share)	Fossil (share)	Rep. Share
Hit by hurricane	-0.001 (0.004)	0.005 (0.011)	0.018 (0.047)	-0.000 (0.001)	0.007 (0.005)	0.007* (0.004)	0.004 (0.008)	0.083 (0.050)	-0.119 (0.882)
Avg. outcome	13.30	10.19	14.23	0.133	0.118	0.0915	0.723	-2.680	46.42
Individual:	House leader	Rep.	Majority	Unsafe	Female	Tenure (terms)	Age (years)		
Hit by hurricane	0.006 (0.007)	-0.024 (0.021)	0.032 (0.033)	-0.010 (0.015)	-0.010 (0.011)	0.121 (0.183)	0.631* (0.369)		
Avg. outcome	0.0416	0.487	0.555	0.130	0.132	4.496	55.06		
N. year/districts	11,087								
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes. Standard errors clustered by state in brackets. ***, **, *: denote significant at 1, 5 and 10 percent level respectively.

- Hurricane trajectory is **essentially random**.
- Our measure of hurricane incidence is essentially uncorrelated with any of district or Congress member characteristics.
- Lends support to causal interpretation of the estimates.

Table 2: Baseline Estimates

	(1)	(2)	(3)	(4)	(5)
	N. of green bills				
Hit by hurricane	-0.250*** (0.077)	0.072 (0.084)	0.110 (0.076)	0.111* (0.066)	0.109 (0.080)
Avg. outcome	1.321				
N. year/districts	11,087	11,047	11,044	11,029	11,044
Hit by hurricane (t-1)	0.051 (0.098)	0.389*** (0.063)	0.419*** (0.083)	0.443*** (0.081)	0.423*** (0.086)
Avg. outcome	1.249				
N. year/districts	10,658	10,618	10,611	10,563	10,611
Year FE	Yes	Yes	Yes	Yes	Yes
State FE	No	Yes	No	No	No
District FE	No	No	Yes	No	Yes
Individual FE	No	No	No	Yes	No
State trends	No	No	No	No	Yes
Controls	No	Yes	Yes	Yes	Yes

Notes. State linear trends in column (5). *N. of green bills* sponsored and cosponsored, as defined by the CBP. *Controls* includes the n. of non green bills sponsored/cosponsored; the share of the Green and the Republican party in the previous election; the log of population, area, and per capita income; the share of population over 65, black, foreign born, and urban; the log of the ratio between national share of coal/oil production and the national share population (from *U.S. EIA*), at state level; a dummy for belonging in the House minority party; being House leader (speaker, minority/majority leader/whip, standing committee chair), republican, in the first session, female, and elected in an unsafe district (less than 10% margin of victory); tenure (terms) and age (years). Standard errors clustered by state in brackets. ***, **, * denote significant at 1, 5 and 10 percent level respectively.

Baseline Results

- Without conditioning on geographic effects, negative relationship between green bills and hurricanes → hurricanes happen in districts less likely to support environmental regulation.
- Strong evidence that hurricanes in year $t - 1$ raise number of green bills in year t .
- Magnitude of the effect not negligible: about 30% of the mean.
- Robust to specification of fixed effects, inclusion of state-specific trends.

Table 3: Alternative Measures

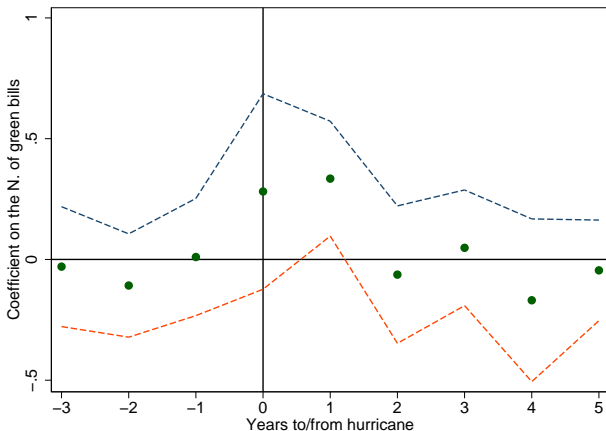
	(1)	(2)	(3)	(4)	(5)	(6)
	N. of green bills					N. of green bills (C2ES)
Hit by hurricane (t-1)						0.187** (0.070)
Share counties (t-1)	0.440*** (0.086)					
Share pop. (t-1)		0.446*** (0.082)				
Max wind (mph/100) (t-1)			0.247*** (0.060)			
N. hurricanes (t-1)				0.263*** (0.055)		
Major disasters					0.217*** (0.050)	
Avg. outcome	1.250					0.638
N. year/districts	10,611	10,611	10,611	10,611	10,611	8,527
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
District FE	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes

Notes. *Major disasters* declarations only (not Emergency). *N. of green bills* sponsored and cosponsored, as defined by the CBP. *Controls* see Table 2. Standard errors clustered by state in brackets. ***, **, *: denote significant at 1, 5 and 10 percent level respectively.

- Results robust to:
 - different measures of hurricane incidence.
 - restricting attention to Major Disasters only.
 - different definition of green bills.

- We are fairly confident that the main result holds true.

Event Study Analysis



Notes. The figure displays the estimated number of green bills sponsored/cosponsored at different lags and leads since a hurricane hit the district (denoted by a vertical line). All estimates include year and district fixed-effects, plus all the controls as in Column (3) of Table 2. *N. of green bills* sponsored and cosponsored, as defined by the *CBP*. Sample: districts with at most two hurricane events during the decade, and all lags and leads available (6,166 year/district observations). 95 percent confidence intervals reported (standard errors clustered by state).

- No differences in green legislation in the years before the hurricane.
- Increase in years t and $t + 1$, drops back to normal in year after that.
- **Salience?**

Table 4: Placebo Tests

	(1)	(2)	(3)	(4)	(5)
	N. of other non-env. bills	N. of other env. bills		N. of green bills	
Hit by hurricane (t-1)	-2.024 (1.470)	-0.253 (0.156)			
Hit by snow (t-1)			0.056 (0.066)		
Hit by storm (t-1)				-0.063 (0.054)	
Hit by tornado (t-1)					0.103 (0.114)
Avg. outcome	104.6	7.445	1.250	1.250	1.250
N. year/districts	10,611	10,611	10,611	10,611	10,611
Year FE	Yes	Yes	Yes	Yes	Yes
District FE	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes

Notes. Controls see Table 2. *N. of green bills*, *N. of other non-env. bills* and *N. of other env. bills* sponsored and cosponsored, as defined by the CBP. *Snow* includes snowfalls, freezings and severe ice storms. *Storm* includes severe storms and coastal storms. Standard errors clustered by state in brackets. ***, **, *: denote significant at 1, 5 and 10 percent level respectively.

Placebo Tests

- No evidence that other environmental bills, or any other bills are affected by hurricanes.
 - Not the case that hurricanes increase politician's visibility and spurs activity.
- Response of climate change bills only to hurricanes, not to other types of disasters.
 - Climate change legislation only in response to disasters that public opinion most associate with climate change.

Table 5: Heterogeneous Estimates

	(1)	(2)	(3)	(4)	(5)	(6)
	N. of green bills					
Hit by hurricane (t-1)	0.706*** (0.116)	-0.065 (0.078)	0.442*** (0.084)	0.441*** (0.083)	0.462*** (0.093)	0.462*** (0.088)
X Republican	-0.571** (0.222)					
X Minority House		0.979*** (0.187)				
X House leader			-0.483** (0.192)			
X Tenure				0.017 (0.013)		
X Tenure sq.				-0.001 (0.002)		
X MV					0.005** (0.002)	
X MV sq.					-0.000 (0.000)	
X Env. bills (t-2)						0.022** (0.010)
Avg. outcome	1.250	1.250	1.250	1.250	1.250	1.283
N. year/districts	10,612	10,612	10,612	10,612	10,612	8,401
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
District FE	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes

Notes. Controls see Table 2. N. of green bills sponsored and cosponsored, as defined by the CBP. All continuous interaction variables demeaned. Standard errors clustered by state in brackets. ***, **, *: denote significant at 1, 5 and 10 percent level respectively.

- Response to hurricanes less strong in districts where Republicans won.
- Stronger when representative is in minority party, and less strong when in House leadership. Focus on national agenda?
- Also stronger for those with previous record on environmental issues, and in safer districts.

Table 6: Bill Outcomes

	(1)	(2)	(3)	(4)
	N. of green bills that:			
	Passed the House		Became Public Law	
Hit by hurricane (t-1)	0.076** (0.031)	-0.171*** (0.050)	-0.003 (0.006)	-0.024*** (0.005)
X Minority House		0.496*** (0.094)		
X Minority Congress				0.034*** (0.010)
Avg. outcome	0.203	0.203	0.0295	0.0295
N. year/districts	10,611	10,611	10,611	10,611
Year FE	Yes	Yes	Yes	Yes
District FE	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes

Notes. Controls see Table 2. N. of green bills sponsored and cosponsored, as defined by the CBP. Minority Congress equal to 1 if the party has no majority in both the House and the Senate. Standard errors clustered by state in brackets. ***, **, * denote significant at 1, 5 and 10 percent level respectively.

- Hurricanes raise number of green bills that pass the House, no effect on probability of becoming law (but very few bills become law).
- However, positive effect also on the probability of becoming law if in the minority, the opposite if in the majority:
 - More party discipline.
 - Focus on national agenda.
- Suggests that response by politicians is real, not just making noise.

Table 7: Neighboring Districts

	(1)	(2)
	N. of green bills	
Hit by hurricane (t-1)	0.444*** (0.095)	0.454*** (0.089)
Neighboring district hit by hurricane (t-1)	0.178 (0.135)	
District in state hit by hurricane (t-1)		0.069 (0.082)
Avg. outcome	1.250	1.250
N. year/districts	10,611	10,611
Year FE	Yes	Yes
District FE	Yes	Yes
Controls	Yes	Yes

Notes. Controls see Table 2. *N. of green bills* sponsored and cosponsored, as defined by the CBP. *Neighboring district* and *District in state* are dummies equal to 1 if the district is not hit but at least one close to it. Standard errors clustered by state in brackets. ***, **, *. denote significant at 1, 5 and 10 percent level respectively.

- No significant response to hurricanes in neighboring districts:
 - **Information less important** than expected.
 - What matters is experiencing damages.

- So far, implicitly assumed politicians aligned to voters' interest. Is that correct?
- Analyze if voters reward politicians' actions by looking at reelection probability and campaign contributions:
 - Collapse yearly data by Congress.
 - Separate green bills before (or in the absence of) a hurricane, and after.
 - Also include **congress member fixed effects** to account for endogeneity of green bills.

Table 8: Electoral Outcomes

	(1)	(2)	(3)	(4)
	Run Next	Share Next	MV Next	Win Next
Hit by hurricane	0.009 (0.043)	-0.884 (0.698)	-0.015 (0.016)	-0.000 (0.013)
N. green bills	0.006 (0.005)	0.032 (0.055)	0.001 (0.001)	0.001 (0.002)
N. green bills after a hurricane	-0.023 (0.017)	-0.758*** (0.189)	-0.018*** (0.005)	-0.002 (0.005)
Avg. outcome	0.806	65.08	0.467	0.967
N. congress/districts	4,091	3,036	3,031	3,045
Congress FE	Yes	Yes	Yes	Yes
District FE	Yes	Yes	Yes	Yes
Individual FE	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes

Notes. Uncontested races excluded. *Margin Victory Next* defined as the relative margin with respect to the second candidate. *Margin Victory Next* and *Win Next* only defined if running for re-election. Controls see Table 2. Standard errors clustered by state in brackets. ***, **, *: denote significant at 1, 5 and 10 percent level respectively.

Table 9: Individual Campaign Contributions (log 1,000 \$)

	(1)	(2)	(3)	(4)	(5)	(6)
	Oil	Automotive	Union	Ideology	Public	Other
Hit by hurricane	0.411** (0.184)	-0.091 (0.071)	-0.049 (0.196)	0.057 (0.222)	-0.086 (0.075)	-0.026 (0.064)
N. green bills	0.017 (0.024)	-0.021 (0.016)	-0.029 (0.034)	-0.008 (0.028)	-0.009 (0.009)	-0.011* (0.006)
N. green bills after a hurricane	-0.231** (0.106)	-0.133** (0.051)	-0.010 (0.087)	-0.014 (0.123)	0.010 (0.025)	0.005 (0.020)
Avg. outcome	-0.124	1.566	-7.197	-0.344	2.906	5.399
N. congress/districts	3,045	3,045	3,045	3,045	3,045	3,045
Congress FE	Yes	Yes	Yes	Yes	Yes	Yes
District FE	Yes	Yes	Yes	Yes	Yes	Yes
Individual FE	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes

Notes. Uncontested races excluded. All outcomes only defined if running for re-election. *Controls* see Table 2. Standard errors clustered by state in brackets. ***, **, *: denote significant at 1, 5 and 10 percent level respectively.

- No direct effect of hurricanes on electoral outcomes.
 - **Doing more green bills** in response to a hurricane doesn't affect reelection, but **reduces support** especially from most damaged voters (oil/automotive):
 - Politicians' over-reaction/miscalculation.
 - Politicians' going against voters' will.
- ⇒ TODO: Look at who's more likely to confront voters (safer seats?)

Conclusion

- Shown evidence that US House members react to hurricanes affecting their districts by initiating more green legislation.
- Three novel insights w.r.t. literature:
 - Effect appears to be short-lived. Suggestive that **even global threats subject to inattention.**
 - Reaction kicks in only after experience. Suggestive that **information is not enough.**
 - Evidence of a penalty for supporting green legislation on re-election and campaign funds. Suggestive that **politicians make mistakes, or do the right thing.**

THANK YOU!

Why so little action on climate change?

- **Collective action failure:** incentive to free-ride on others' emissions reductions.
- **Misinformation:** public unaware/miscalculates costs and benefits.
- **Myopia:** kicking the can down the road.
- **Rational:** Future generations' welfare heavily discounted.
- **Inattention:** Does not put enough weight on costs unless salient.

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- How do voters respond to hurricanes?
 - Use survey data from the *Yale Program on Climate Change Communication* about voters' beliefs on climate change, aggregated from county to district level (*Climate Change in the American Mind*, 2014 and 2016).
 - Apply DiD (no hurricanes in 2014 and 2015) to estimate the response in voters' opinion.

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Table 10: Voters' Beliefs on Climate Change - Hurricanes

	(1)	(2)	(3)	(4)	(5)	(6)
	Pct. support limit fossil	Pct. support CO2 regulation	Pct. support renewables	Pct. believe is happening	Pct. believe is human	Pct. believe science
Hit by hurricane	5.352*** (1.066)	1.486*** (0.310)	2.128*** (0.397)	0.510 (0.656)	0.561 (0.425)	0.871* (0.472)
Avg. outcome	64.63	73.73	61.99	64.91	49.20	42.99
	Pct. worried	Pct. believe will harm				
		the U.S.	themselves	poor countries	future generations	in 10 years
Hit by hurricane	0.881 (0.703)	0.092 (0.476)	0.013 (0.508)	1.236** (0.528)	1.833*** (0.526)	0.760 (0.476)
Avg. outcome	53.74	53.21	36.17	56.14	64.45	45.31
N. year/counties	696					
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
District FE	Yes	Yes	Yes	Yes	Yes	Yes

Notes. Standard errors clustered by state in brackets. ***, **, *: denote significant at 1, 5 and 10 percent level respectively.

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Table 11: Voters' Beliefs on Climate Change - Snow

	(1)	(2)	(3)	(4)	(5)	(6)
	Pct. support limit fossil	Pct. support CO2 regulation	Pct. support renewables	Pct. believe is happening	Pct. believe is human	Pct. believe science
Hit by snow	-1.640 (1.221)	-0.567 (0.467)	-0.973* (0.523)	-0.786** (0.390)	-0.018 (0.366)	-1.136* (0.590)
Avg. outcome	64.63	73.73	61.99	64.91	49.20	42.99
	Pct. worried	Pct. believe will harm				
		the U.S.	themselves	poor countries	future generations	in 10 years
Hit by snow	-0.364 (0.618)	-0.209 (0.400)	0.155 (0.347)	-0.281 (0.546)	-0.766 (0.663)	-0.042 (0.417)
Avg. outcome	53.74	53.21	36.17	56.14	64.45	45.31
N. year/counties	696					
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
County FE	Yes	Yes	Yes	Yes	Yes	Yes

Notes. *Snow* includes snowfalls, freezings and severe ice storms. Standard errors clustered by state in brackets. ***, **, *: denote significant at 1, 5 and 10 percent level respectively.

Table 12: Voters' Beliefs on Climate Change - Storms

	(1)	(2)	(3)	(4)	(5)	(6)
	Pct. support limit fossil	Pct. support CO2 regulation	Pct. support renewables	Pct. believe is happening	Pct. believe is human	Pct. believe science
Hit by storm	-0.771 (0.749)	-0.250 (0.383)	-0.570 (0.390)	-0.667 (0.432)	-0.469 (0.372)	-0.833* (0.459)
Avg. outcome	64.63	73.73	61.99	64.91	49.20	42.99
	Pct. worried	Pct. believe will harm				
		the U.S.	themselves	poor countries	future generations	in 10 years
Hit by storm	-0.457 (0.312)	-0.272 (0.330)	-0.287 (0.325)	-0.299 (0.421)	-0.104 (0.444)	-0.455 (0.366)
Avg. outcome	53.74	53.21	36.17	56.14	64.45	45.31
N. year/counties	696					
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
County FE	Yes	Yes	Yes	Yes	Yes	Yes

Notes. Storm includes severe storms and coastal storms. Standard errors clustered by state in brackets. ***, **, *: denote significant at 1, 5 and 10 percent level respectively.

Table 13: Voters' Beliefs on Climate Change - Tornadoes

	(1)	(2)	(3)	(4)	(5)	(6)
	Pct. support limit fossil	Pct. support CO2 regulation	Pct. support renewables	Pct. believe is happening	Pct. believe is human	Pct. believe science
Hit by tornado	0.993 (1.413)	0.299 (0.378)	1.461 (0.895)	0.533 (0.677)	1.009 (0.715)	0.605 (0.908)
Avg. outcome	64.63	73.73	61.99	64.91	49.20	42.99
	Pct. worried	Pct. believe will harm				
		the U.S.	themselves	poor countries	future generations	in 10 years
Hit by tornado	1.236* (0.724)	0.142 (0.609)	0.521* (0.272)	0.503 (0.831)	0.566 (0.631)	1.434 (0.898)
Avg. outcome	53.74	53.21	36.17	56.14	64.45	45.31
N. year/counties	696					
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
County FE	Yes	Yes	Yes	Yes	Yes	Yes

Notes. Standard errors clustered by state in brackets. ***, **, *: denote significant at 1, 5 and 10 percent level respectively.

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- Hurricanes increase awareness about global warming and demand for regulation among voters.
- No relevant response to other natural disasters.
 - If anything, cold waves have the opposite effect.

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