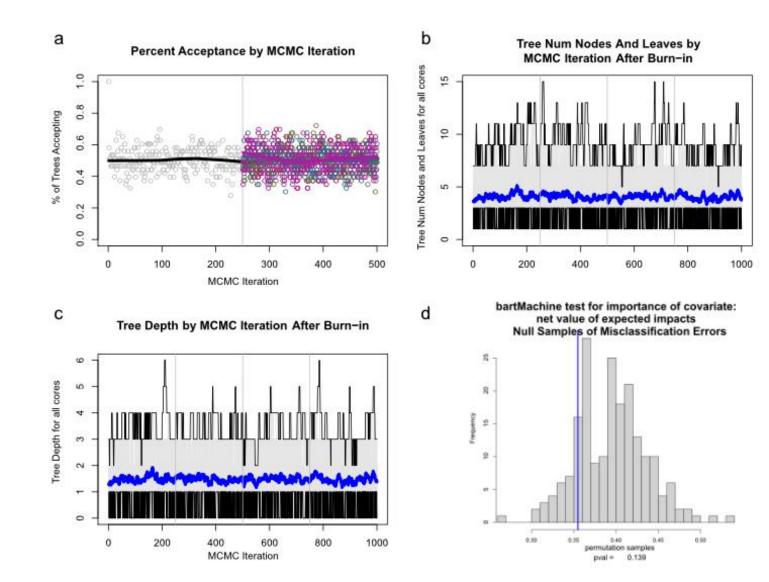Supporting Information for

To mitigate or adapt? Explaining why citizens responding to climate change favour the former

Authors: Kristina Blennow [1,*] and Johannes Persson [2]

[1] Department of Landscape architecture, Planning and Management, SLU Alnarp, Swedish University of Agricultural Sciences

[2] Department of Philosophy, Lund University

[*] Correspondence: Kristina.Blennow@slu.se

Figure S1. Convergence diagnostics and test of covariate importance for a BART model of the probability of having decided in favour of adaptation (taken as the equivalent of the expected utility value of adaptation). Per cent Metropolis-Hastings proposals accepted across the 43 trees with one point per iteration (a); average number of leaves across the trees by iteration (b); average tree depth across the trees used by iteration (c); test results for the importance of the covariate net value of expected impacts (d). The grey vertical line separates burn-in iterations and post-burn-in iterations and colours of dots illustrate the different computing cores used (a). The p-value is the fraction of permutation-sampled total misclassification errors less than the observed total misclassification error (d).

a

Percent Acceptance by MCMC Iteration

% of Trees Accepting

MCMC Iteration

b

Tree Num Nodes And Leaves by MCMC Iteration After Burn−in

Tree Num Nodes and Leaves for all cores

MCMC Iteration

c

Tree Depth by MCMC Iteration After Burn−in

Tree Depth for all cores

MCMC Iteration

d

bartMachine test for importance of covariate: net value of expected impacts

Null Samples of Misclassification Errors

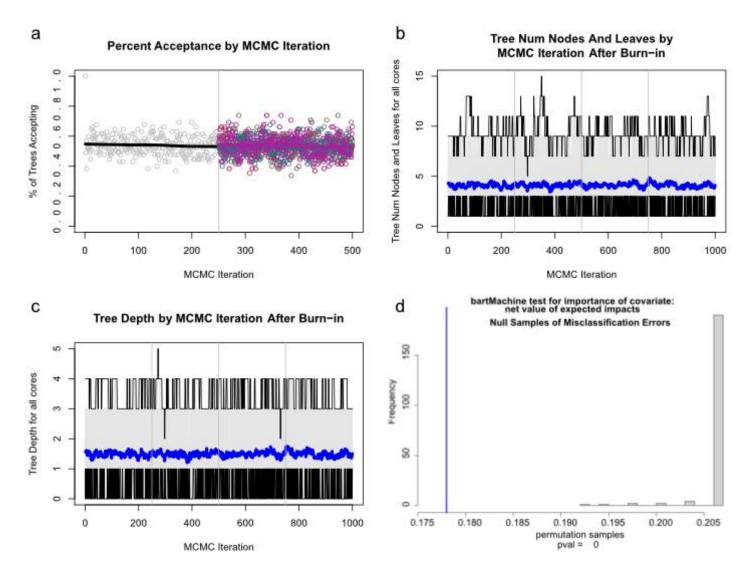Frequency

permutation samples
pval = 0

Figure S2. Convergence diagnostics and test of covariate importance for a BART model of the probability of having decided in favour of mitigation (taken as the equivalent of the expected utility value of mitigation). Per cent Metropolis-Hastings proposals accepted across the 65 trees with one point per iteration (a); average number of leaves across the trees by iteration (b); average tree depth across the trees used by iteration (c); test results for the importance of the covariate net value of expected impacts (d). The grey vertical line separates burn-in iterations and post-burn-in iterations and colours of dots illustrate the different computing cores used (a). The p-value is the fraction of permutation-sampled total misclassification errors less than the observed total misclassification error (d).

Table S1. Responses to survey questions by response level split between those who have/have not decided in favour of adaptation and mitigation of climate change, respectively (Q7 and Q8 in Table 1).

Number	Question	Response option	Has decided in favour of adaptation (n=70) 0.21 [0.17, 0.25]	Has not decided in favour of adaptation (n=268) 0.79 [0.76, 0.83]	Significant difference in estimated relative proportion of having decided in favour of adaptation - not having decided in favour of adaptation per response option and 90% CI	Has decided in favour of mitigation (n=268) 0.79 [0.75, 0.83]	Has not decided in favour of mitigation (n=70) 0.21 [0.17, 0.24]	Significant difference in estimated relative proportion of having decided in favour of mitigation - not having decided in favour of mitigation per response option and 90% CI
1	Do you believe that the climate is changing because of human causes to the extent that it will affect you and/or your environment negatively?	Yes, definitely Yes, probably I do not know Probably not Definitely not	57 9 4 0 0	196 56 7 8 1	- - - - -	214 45 6 3 0	39 20 5 5 1	0.24 [0.14, 0.35] -0.12 [-0.21, -0.024] -0.05 [-0.11, -0.004] -0.07 [-0.12, -0.016] -
2	Do you believe that the climate is changing because of human causes to the extent that it will affect you and/or your environment positively?	Yes, definitely Yes, probably I do not know Probably not Definitely not	11 6 10 26 17	34 36 22 123 53	- - - - -	36 31 22 121 58	9 11 10 28 12	- - - - -
3	Have you yourself experienced that sudden extreme situations or gradual changes have occurred in the municipality that you interpret as caused by long-term and global climate change and that has negative impacts?	Yes, definitely Yes, probably I do not know Probably not Definitely not	23 25 16 6 0	51 95 82 32 8	0.14 [0.044, 0.24] - - - -	68 100 74 22 4	6 20 90 16 4	0.16 [0.088, 0.23] - - -0.15 [-0.24, -0.066] -0.050 [-0.10, -0.0029]
4	Have you yourself experienced that sudden	Yes, definitely Yes, probably	5 9	7 29	- -	36 31	9 11	- -

	extreme situations or gradual changes have occurred in the municipality that you interpret as caused by long-term and global climate change and that has positive impacts?	I do not know Probably not Definitely not	22 25 9	95 88 49	- - -	22 121 58	10 28 12	- - -
5	Do you expect that long-term and global climate changes will lead to negative impacts in Malmö on:							
a	Transport	Yes, always Often Rarely No, never I do not know[b]	15 24 15 2 14	41 107 40 17 63	- - - - -	42 104 43 14 65	14 27 12 5 12	- - - - -
b	Beaches	Yes, always Often Rarely No, never I do not know[b]	27 29 10 2 2	93 102 39 9 25	- - - - -0.06 [-0.10, -0.0079]	106 113 29 5 15	14 18 20 6 12	0.19 [0.098, 0.28] 0.16 [0.060, 0.26] -0.18 [-0.27, -0.085] -0.070 [-0.13, -0.018] -0.12 [-0.20, -0.043]
c	The coast	Yes, always Often Rarely No, never I do not know[b]	30 26 9 1 4	101 101 29 10 27	- - - - -0.060 [-0.11, -0.015]	116 107 25 4 16	15 20 13 7 15	0.21 [0.12, 0.31] 0.11 [0.0072, 0.21] -0.10 [-0.18, -0.016] -0.090 [-0.15, -0,030] -0.17 [-0.26, -0.092]
d	The value of my property	Yes, always Often Rarely No, never I do not know[b]	4 12 23 12 19	18 37 67 46 100	- - - - -	19 40 71 46 92	3 9 19 12 27	- - - - -
e	The value of others´ property	Yes, always Often Rarely	7 24 19	24 71 67	- - -	27 85 64	4 10 22	- 0.17 [0.082, 0.25] -

		No, never	1	14	-	9	6	-0.060 [-0.12, -0.0013]
		I do not know[b]	19	92	-	83	28	-
f	Damage to my property	Yes, always	9	20	-	25	4	-
		Often	16	50	-	54	12	-
		Rarely	21	81	-	82	20	-
		No, never	9	40	-	37	12	-
		I do not know[b]	15	77	-	70	22	-
g	Damage to others´ property	Yes, always	11	25	-	32	4	-
		Often	23	90	-	98	15	0.15 [0.054, 0.24]
		Rarely	20	75	-	74	21	-
		No, never	1	16	-	7	10	-0.12 [-0.19, -0.052]
		I do not know[b]	15	62	-	57	20	-
h	Nature/fauna/flora	Yes, always	31	105	-	123	13	0.27 [0.17, 0.36]
		Often	28	110	-	112	26	-
		Rarely	8	21	-	18	11	-0.090 [-0.17, -0.020]
		No, never	1	12	-	4	9	-0.12 [-0.18, -0.052]
		I do not know[b]	2	20	-	11	11	-0.12 [-0.20, -0.048]
i	Spread of alien species	Yes, always	22	66	-	79	9	0.16 [0.076, 0.24]
		Often	22	94	-	95	21	-
		Rarely	12	36	-	35	13	-
		No, never	1	13	-	6	8	-0.10 [-0.16, -0.034]
		I do not know[b]	13	59	-	53	19	-
j	Permanent inundation of coastal areas	Yes, always	20	77	-	85	12	0.14 [0.053, 0.23]
		Often	27	93	-	104	16	0.15 [0.058, 0.25]
		Rarely	16	44	-	44	16	-
		No, never	0	14	-0.040 [-0.074, -0.011]	6	8	-0.10 [-0.16, -0.034]
		I do not know[b]	7	40	-	29	18	-0.15 [-0.24, -0.060]
k	Opportunities for outdoor swimming	Yes, always	14	51	-	55	10	-
		Often	20	86	-	90	16	0.10 [0.0081, 0.20]
		Rarely	27	58	0.17 [0.067, 0.27]	70	15	-
		No, never	1	28	-0.080 [-0.12, -0.036]	15	14	-0.15 [-0.23, -0.067]
		I do not know[b]	8	45	-	38	15	-
l	The temperature climate	Yes, always	27	93	-	110	10	0.26 [0.17, 0.34]
		Often	33	113	-	119	27	-
		Rarely	6	20	-	15	11	-0.10 [-0.18, -0.032]

		No, never	2	16	-	9	9	-0.10 [-0.17, -0.033]
		I do not know[b]	2	26	-0.060 [-0.11, -0.011]	15	13	-0.13 [-0.21, -0.053]
m	Insects indoors	Yes, always	11	33	-	38	6	-
		Often	21	61	-	64	18	-
		Rarely	19	43	0.11 [0.020, 0.21]	51	11	-
		No, never	1	29	-0.080 [-0.13, -0.040]	17	13	-0.13 [-0.21, -0.049]
		I do not know[b]	18	102	-0.12 [-0.22, -0.021]	98	22	-
n	Health	Yes, always	14	50	-	55	9	-
		Often	36	104	0.12 [0.014, 0.23]	118	22	0.12 [0.018, 0.22]
		Rarely	16	50	-	54	12	-
		No, never	0	18	-0.060 [-0.091, -0.024]	8	10	-0.12 [-0.19, -0.047]
		I do not know[b]	4	46	-0.11 [-0.17, -0.043]	33	17	-0.12 [-0.21, -0.034]
o	Expenses for the municipality	Yes, always	33	98	-	112	19	0.14 [0.041, 0.24]
		Often	23	107	-	113	17	0.17 [0.075, 0.27]
		Rarely	8	23	-	21	10	-
		No, never	2	8	-	4	6	-0.070 [-0.13, -0.021]
		I do not know[b]	4	32	-	18	18	-0.19 [-0.28, -0.10]
p	Heating	Yes, always	16	55	-	65	6	0.15 [0.077, 0.22]
		Often	26	83	-	89	20	-
		Rarely	17	54	-	57	14	-
		No, never	1	25	-0.070 [-0.11, -0.027]	16	10	-0.090 [-0.16, -0.015]
		I do not know[b]	10	51	-	41	20	-0.13 [-0.23, 0.042]
q	Taxes	Yes, always	20	54	-	60	14	-
		Often	21	83	-	88	16	0.10 [0.00083, 0.19]
		Rarely	13	35	-	40	8	-
		No, never	0	13	-0.040 [-0.070, -0.0074]	5	8	-0.10 [-0.17, -0.039]
		I do not know[b]	16	83	-	75	24	-
r	Winter sports	Yes, always	15	58	-	69	4	0.19 [0.13, 0.26]
		Often	27	93	-	97	23	-
		Rarely	6	37	-	31	12	-
		No, never	6	28	-	21	13	-0.11 [-0.19, -0.031]
		I do not know[b]	16	52	-	50	18	-
s	Agriculture	Yes, always	23	94	-	107	10	0.25 [0.16, 0.33]
		Often	30	103	-	114	19	0.15 [0.052, 0.25]
		Rarely	10	21	-	20	11	-0.09 [-0.16, -0.012]

		No, never	2	15	-	4	13	-0.17 [-0.25, -0.099]
		I do not know[b]	5	35	-	23	17	-0.16 [-0.25, -0.073]
t	Tourism	Yes, always	13	31	-	38	6	-
		Often	19	70	-	72	17	-
		Rarely	19	63	-	66	16	-
		No, never	5	22	-	18	9	-
		I do not know[b]	14	82	-0.10 [-0.19, -0.0095]	74	22	-
u	Drinking water	Yes, always	18	72	-	82	8	0.18 [0.11, 0.26]
		Often	28	86	-	92	22	-
		Rarely	15	36	-	41	10	-
		No, never	1	14	-	5	10	-0.13 [-0.20, -0.061]
		I do not know[b]	8	60	-0.10 [-0.18, -0.025]	48	20	-0.11 [-0.2, -0.013]
v	The precipitation climate	Yes, always	25	90	-	108	7	0.29 [0.22, 0.37]
		Often	32	101	-	105	28	-
		Rarely	7	25	-	22	10	-
		No, never	1	13	-	5	9	-0.11 [-0.18, -0.047]
		I do not know[b]	5	39	-0.07 [-0.13, -0.0033]	28	16	-0.13 [-0.22, -0.044]
x	The wind climate	Yes, always	24	76	-	96	4	0.29 [0.22, 0.36]
		Often	30	99	-	101	28	-
		Rarely	8	26	-	24	10	-
		No, never	2	9	-	4	7	-0.09 [-0.15, -0.03]
		I do not know[b]	6	58	-0.12 [-0.19, -0.052]	43	21	-0.14 [-0.24, -0.043]
6	Do you expect long-term and global climate changes will lead to positive impacts in Malmö on:							
a	Transports	Yes, always	0	7	-	4	3	-
		Often	2	17	-	16	3	-
		Rarely	21	53	0.10 [0.0072, 0.20]	56	18	-
		No, never	25	116	-	116	25	-
		I do not know[b]	22	75	-	76	21	-
b	Beaches	Yes, always	1	7	-	4	4	-0.05 [-0.10, -0.0029]
		Often	10	14	0.090 [0.023, 0.17]	18	6	-
		Rarely	23	64	-	71	16	-

		No, never	29	139	-	143	25	0.17 [0.071, 0.28]
		I do not know[b]	7	44	-	32	19	-0.15 [-0.24, -0.061]
c	The coast	Yes, always	0	4	-	2	2	-
		Often	7	10	0.070 [0.0073, 0.13]	10	7	-0.21 [-0.29, -0.12]
		Rarely	19	63	-	64	18	-
		No, never	36	141	-	154	23	0.24 [0.14, 0.35]
		I do not know[b]	8	50	-	38	20	-0.15 [-0.24, -0.051]
d	The value of my property	Yes, always	0	2	-	1	1	-
		Often	3	9	-	7	5	-
		Rarely	19	45	0.11 [0.013, 0.21]	49	15	-
		No, never	25	110	-	110	25	-
		I do not know[b]	23	102	-	101	24	-
e	The value of others´ property	Yes, always	0	4	-	2	2	-
		Often	5	11	-	11	5	-
		Rarely	19	51	-	56	14	-
		No, never	22	98	-	96	24	-
		I do not know[b]	24	104	-	103	25	-
f	Damage to my property	Yes, always	1	2	-	1	2	-
		Often	1	5	-	1	5	-0.07 [-0.13, -0.022]
		Rarely	18	34	0.13 [0.097, 0.16]	38	14	-
		No, never	29	135	-	138	26	0.14 [0.035, 0.25]
		I do not know[b]	21	92	-	90	23	-
g	Damage to others´ property	Yes, always	1	5	-	3	3	-
		Often	3	5	-	3	5	-0.07 [-0.12, -0.016]
		Rarely	16	38	0.090 [0.0045, 0.18]	39	15	-
		No, never	29	124	-	131	22	0.17 [0.069, 0.27]
		I do not know[b]	21	96	-	92	25	-
h	Nature/fauna/flora	Yes, always	0	8	-	3	5	-0.07 [-0.12, -0.016]
		Often	7	18	-	18	7	-
		Rarely	28	62	0.17 [0.068, 0.27]	73	17	-
		No, never	26	129	-	133	22	0.18 [0.077, 0.28]
		I do not know[b]	9	51	-	41	19	-0.12 [-0.22, -0.029]
i	Spread of alien species	Yes, always	0	4	-	2	2	-
		Often	6	26	-	26	6	-
		Rarely	21	45	0.13 [0.035, 0.23]	51	15	-

		No, never	27	118	-	122	23	0.12 [0.020, 0.23]
		I do not know[b]	16	75	-	67	24	-
j	Permanent inundation of coastal areas	Yes, always	0	5	-	3	2	-
		Often	5	9	-	9	5	-
		Rarely	14	35	-	38	11	-
		No, never	34	160	-0.11 [-0.22, -0.0044]	161	33	0.13 [0.02, 0.24]
		I do not know[b]	17	59	-	57	19	-
k	Opportunities for outdoor swimming	Yes, always	1	8	-	6	3	-
		Often	9	31	-	31	9	-
		Rarely	20	57	-	64	13	-
		No, never	28	102	-	108	22	-
		I do not know[b]	12	70	-	59	23	-0.11 [-0.21, -0.011]
l	The temperature climate	Yes, always	3	7	-	7	3	-
		Often	15	30	0.10 [0.017, 0.19]	35	10	-
		Rarely	15	82	-	80	17	-
		No, never	29	103	-	108	24	-
		I do not know[b]	8	46	-	38	16	-0.09 [-0.18, -0.0031]
m	Insects indoors	Yes, always	0	4	-	1	3	-0.04 [-0.089, -0.0056]
		Often	6	4	0.080 [0.022, 0.14]	9	1	-
		Rarely	10	33	-	31	12	-
		No, never	34	110	-	123	21	0.15 [0.050, 0.25]
		I do not know[b]	20	117	-0.15 [-0.25, -0.046]	104	33	-
n	Health	Yes, always	1	7	-	4	4	-0.05 [-0.10, -0.0029]
		Often	5	14	-	16	3	-
		Rarely	19	53	-	59	13	-
		No, never	32	121	-	129	24	0.14 [0.032, 0.24]
		I do not know[b]	13	73	-	60	26	-0.15 [-0.25, -0.044]
o	Expenses for the municipality	Yes, always	2	8	-	5	5	-0.06 [-0.11, -0.007]
		Often	4	7	-	6	5	-0.05 [-0.11, -0.004]
		Rarely	19	50	-	56	13	-
		No, never	34	129	-	144	19	0.26 [0.16, 0.36]
		I do not know[b]	11	74	-0.11 [-0.20, -0.029]	57	28	-0.19 [-0.29, -0.085]
p	Heating	Yes, always	2	11	-	8	5	-
		Often	8	26	-	31	3	0.06 [0.0083, 0.12]
		Rarely	15	60	-	59	16	-

		No, never	27	100	-	108	19	0.13 [0.029, 0.23]
		I do not know[b]	18	71	-	62	27	-0.16 [-0.26, -0.052]
q	Taxes	Yes, always	2	10	-	3	9	-0.12 [-0.19, -0.056]
		Often	2	10	-	8	4	-
		Rarely	12	37	-	41	8	-
		No, never	34	122	-	137	19	0.24 [0.13, 0.33]
		I do not know[b]	20	89	-	79	30	-0.13 [-0.24, -0.028]
r	Winter sports	Yes, always	3	4	-	4	3	-
		Often	5	17	-	19	3	-
		Rarely	14	50	-	42	22	-0.16 [-0.26, -0.061]
		No, never	31	135	-	147	19	0.27 [0.17, 0.37]
		I do not know[b]	17	62	-	56	23	-0.12 [-0.22, -0.021]
s	Agriculture	Yes, always	3	6	-	5	4	-
		Often	11	26	-	32	5	-
		Rarely	15	72	-	69	18	-
		No, never	28	107	-	119	16	0.21 [0.11, 0.30]
		I do not know[b]	13	57	-	43	27	-0.23 [-0.33, -0.13]
t	Tourism	Yes, always	1	9	-	7	3	-
		Often	16	31	0.12 [0.030, 0.20]	38	9	-
		Rarely	17	58	-	62	13	-
		No, never	21	84	-	85	20	-
		I do not know[b]	15	86	-0.10 [-0.19, -0.0079]	76	25	-
u	Drinking water	Yes, always	1	6	-	5	2	-
		Often	3	10	-	9	4	-
		Rarely	21	51	0.11 [0.017, 0.21]	59	13	-
		No, never	25	127	-0.11 [-0.22, -0.0089]	129	23	0.15 [0.048, 0.25]
		I do not know[b]	20	74	-	66	28	-0.15 [-0.26, -0.051]
v	The precipitation climate	Yes, always	2	5	-	4	3	-
		Often	3	11	-	12	2	-
		Rarely	17	54	-	55	16	-
		No, never	35	133	-	146	22	0.23 [0.12, 0.33]
		I do not know[b]	13	65	-	51	27	-0.20 [-0.30, -0.095]
x	The wind climate	Yes, always	1	6	-	4	3	-
		Often	3	12	-	13	2	-
		Rarely	18	51	-	55	14	-

		No, never	32	123	-	133	22	0.18 [0.077, 0.28]
		I do not know[b]	16	76	-	63	29	-0.18 [-0.28, -0.077]

Table S2. Model errors of univariate BART models of decisions in favour of adaptation to the impacts of climate change and mitigation of climate change. Each model is based on 250 burn-in and 1 000 posterior samples.

BART model of decisions in favour of adaptation	Adaptation predicted	No adaptation predicted	Model errors
Has adapted	48	22	0.314
Has not adapted	98	170	0.366
	0.671	0.115	0.355
BART model of decisions in favour of mitigation	Mitigation predicted	No mitigation predicted	
Has mitigated	241	27	0.101
Has not mitigated	39	31	0.557
	0.139	0.466	0.195