Supporting Information

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This section contains additional details about survey implementation and statistical analyses, SI figures, and Table S1. The *SI Appendix* contains JAGS (Just Another Gibbs Sampler) code for statistical models and the survey materials (mail questionnaire, cover letters, and the pretest interview script).

Survey Design and Implementation

We based the value of the incentive for easements on the median value per acre of easements enacted in our study area from 1998–2016 (58). The scenario for future interest agreements was based on land-protection strategies currently being explored by land trusts and town conservation commissions in our study area. We also solicited input from a conservation practitioner who works with landowners in our study area to identify potential practical concerns that could influence landowner intentions.

Climate-change belief questions were presented after we stated that landowners were selected to participate in our survey because research suggested that water levels would rise on their property (the questionnaire included a link to this research). We adapted questions from public opinion surveys of climate-change beliefs and attitudes (59) to solicit beliefs about sea-level rise and coastal flooding specifically. We coded beliefs about sea-level rise as a 10-part scale from very sure that sea-level rise is not happening to very sure that it is happening (see question 14 of the questionnaire, *SI Appendix*). We also quantified the effects of political, geographic, and demographic factors that might need to be accounted for to recover unbiased estimates of the effects of interest (Table S1 and *SI Appendix*).

We randomly assigned landowners to one of three survey versions that differed only by a one-page education message that came after all questions about behavioral intentions, attitudes, norms, or perceived control but before questions about the importance of tidal marsh attributes (the questionnaire in the *SI Appendix* contains all three education messages).

To pretest the survey, we conducted interviews with six coastal landowners (who were not in the survey sample) by telephone and in person to discuss their understanding of draft questions and relevant terminology as well as social psychological variables that are beyond the scope of this paper.

We randomly selected streets from within the marsh migration zone and for each looked up associated noncommercial properties from town tax assessor's databases. For 3,050 properties, we recorded the assessed value, owner's name and address, and property size. We obtained approximate coordinates for each property, in World Geodetic System 1984 (WGS84) decimal degrees, from www.gpsvisualizer.com/geocoder/ and calculated the distance of each property to current tidal marsh (from ref. 23) in ArcGIS (60). We conducted the survey in four waves as follows: (*i*) between 13 February 2015 and 13 March 2015 we sent out the initial cover letter and a 5.5 in × 8.5 in color questionnaire; (*ii*) 1 wk later we sent a reminder postcard; (*iii*) 1 wk later we sent a reminder letter with a second copy of the questionnaire; and (*iv*) 2 wk later we sent a final reminder postcard. Our questionnaire included a cover letter that explained the purpose of the study, how the recipient was selected to participate, that all questions are voluntary, and that the respondent may stop participation at any time. Participants consented by returning the completed questionnaire. Each postcard or letter informed participants that by returning their questionnaire they would be entered into a raffle to win one of two $250 Amazon.com gift cards (see *SI Appendix* for text of letters and postcards). Approximately 1 wk after the final postcard was sent, we called nonrespondents who were listed in public records (n = 2,185) to encourage them to return the questionnaire. We made all calls between 09:00 and 21:00, making as many as possible after 17:00 or on weekends. We were able to reach 612 landowners via telephone and left messages with 645 others. Cornell Survey Research Institute administered the mail questionnaire and conducted the nonresponse telephone calls. We closed the survey period on 15 June 2015.

Statistical Methods

We conducted independent sample t tests to quantify any nonresponse bias by property size and distance to current marsh, the variables that we considered most likely to be affected. The difference between the means of respondents and nonrespondents was small for both variables (property size: 0.04 ha; distance to marsh: 6.5 m). Only the effect of distance to marsh on response rate was positive and statistically significant (using α = 0.05), but the effect size was too small to warrant nonresponse weighting (η = 0.06) (61).

We quantified behavioral intentions and the effects of independent variables using a hierarchical Bayesian approach for combined variable estimation and selection in a generalized linear modeling framework (62, 63). By specifying that a group of three or more related independent variables (e.g., climate-change beliefs) arise from a common distribution that is centered on zero, we represented the prior knowledge that most independent variables are likely to have a small effect on the response variables but some might have moderate to large effects. This prior specification pulls estimates toward each other, which leads to better estimates of the vector of regression coefficients, avoids over-fitting, and estimates the uncertainty of each variable while accounting for the uncertainty of every other variable in the model (62). We represented the relationship between variable groups using a normal distribution centered on zero with unknown variance. To ensure that independent variables were on comparable scales, we divided all variables that were not already Likert- or indicator-scale by two SDs (64). We ruled out the presence of problematic correlation between independent variables by calculating variance inflation factors, which were less than three for all variables (Table S1).

We accounted for any missing responses to questions using a data augmentation structure that allows for uncertainty in independent variables by specifying a parent distribution for each (see refs. 65 and 66). The percent of missing responses for each variable is shown in Table S1. We used a Bernoulli distribution as the parent distribution for indicator variables (using a uniform prior on the Bernoulli parameter), a normal distribution for continuous variables (using a normal prior on its mean and a uniform prior on its variance), and a categorical distribution for Likert items (using a Dirichlet prior; see model code in *SI Appendix*).

We used a Bernoulli distribution to describe variation in a landowner's intention to participate in any conservation agreement and a multinomial distribution with ordered logistic regression for Likert-scale responses (see model code in *SI Appendix*). We coded Likert-scale responses as one through five, representing strongly unlikely, unlikely, neutral, likely, and strongly likely, respectively. We also modeled respondents' first choice of conservation agreement, including the option of not participating in any of the given agreements, using a multinomial distribution.

We quantified spatial variation in behavioral intentions across a hexagonal grid of planning units from the Environmental Protection Agency's Environmental Monitoring and Assessment

Program (https://archive.epa.gov/emap/archive-emap/web/html/). The hexagons in this grid are similar in size to the marsh complexes in our study area and have previously been used to design sampling for studies of tidal marsh birds (43) and conservation planning (44). The statistical model of spatial variation was based on a hexagon-level random effect (see model code in *SI Appendix*). We then used the results of the model to correct hexagon-specific projections of the extent of the marsh migration zone by the proportion of landowners in those hexagons who reported being likely to participate in one of the conservation agreements (question 16 of the survey, *SI Appendix*), propagating uncertainty from estimating behavioral intentions.

We fit models using JAGS (67) in R (68) with the R2jags package (69). Besides the priors described above, we used uninformative priors for all variables (see model code in *SI Appendix*). We ran three chains for 500,000 iterations after a 25,000-iteration burn-in; the potential scale reduction factors (70) for all parameters were less than 1.01.

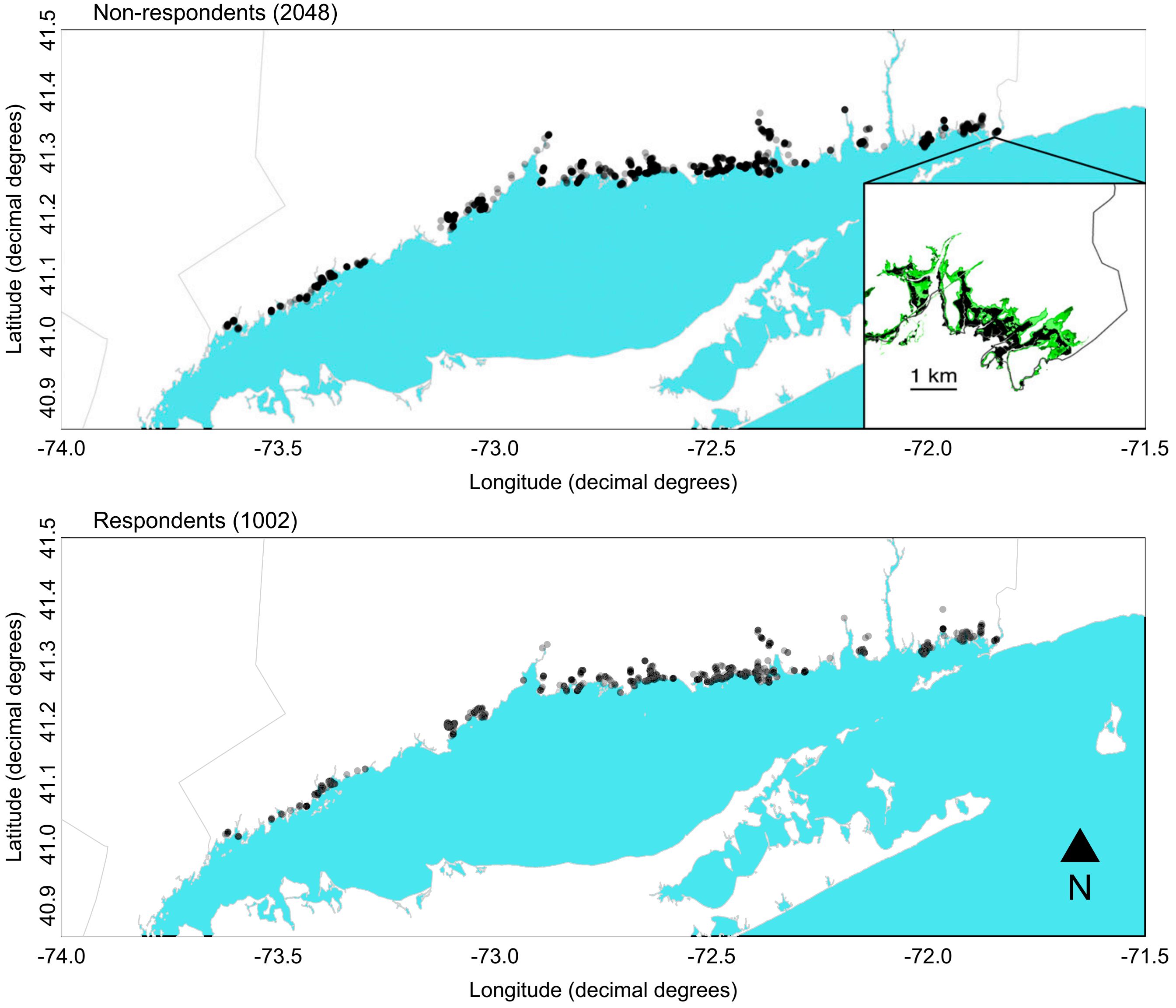

Fig. S1. Locations of the coastal properties of survey respondents (*Lower*) and nonrespondents (*Upper*). We defined our study population as people who own land along the Connecticut coastline within the zone that is projected to become tidal marsh by 2100. Each property is shown as a transparent black dot so that darker areas show greater concentrations of properties. The *Inset* shows an example of the marsh migration zone; the projected extent of tidal marsh in 2100 is shown in green, and current marsh is shown in black. These projections show the maximum potential for migration under 1.2 m of sea-level rise and assume no additional human barriers (i.e., rolling easements as water levels rise).

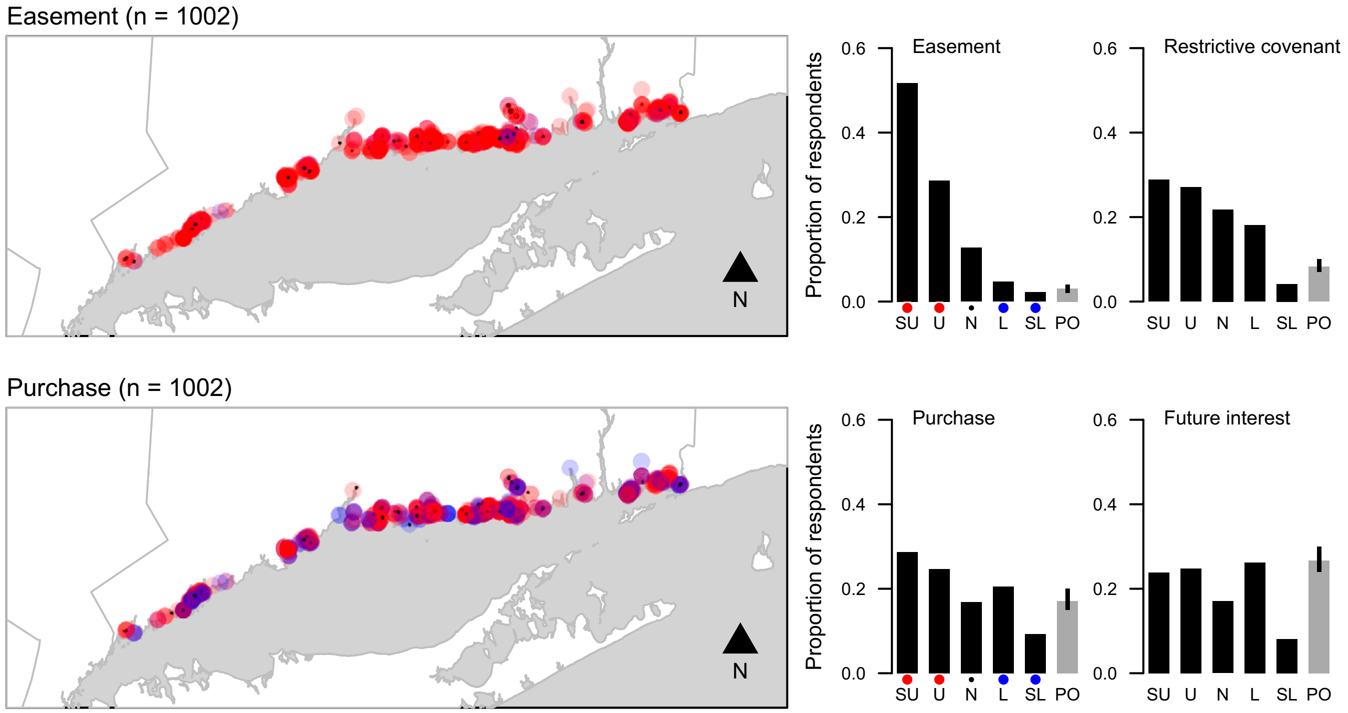

Fig. S2. The stated behavioral intentions of landowners with respect to conservation easements, outright purchases, restrictive covenants, and future interest agreements (n = 1,002). Responses are on a Likert scale, and the spatial distribution of intentions is shown for the two methods widely used in conservation, easement and purchase: strongly unlikely (SU; red circle), unlikely (U; red circle), neutral (N; small black circle), likely (L; blue circle), and strongly likely (SL; blue circle). The gray bars show landowners' most preferred option (PO) and the associated 95% credible intervals (black whiskers).

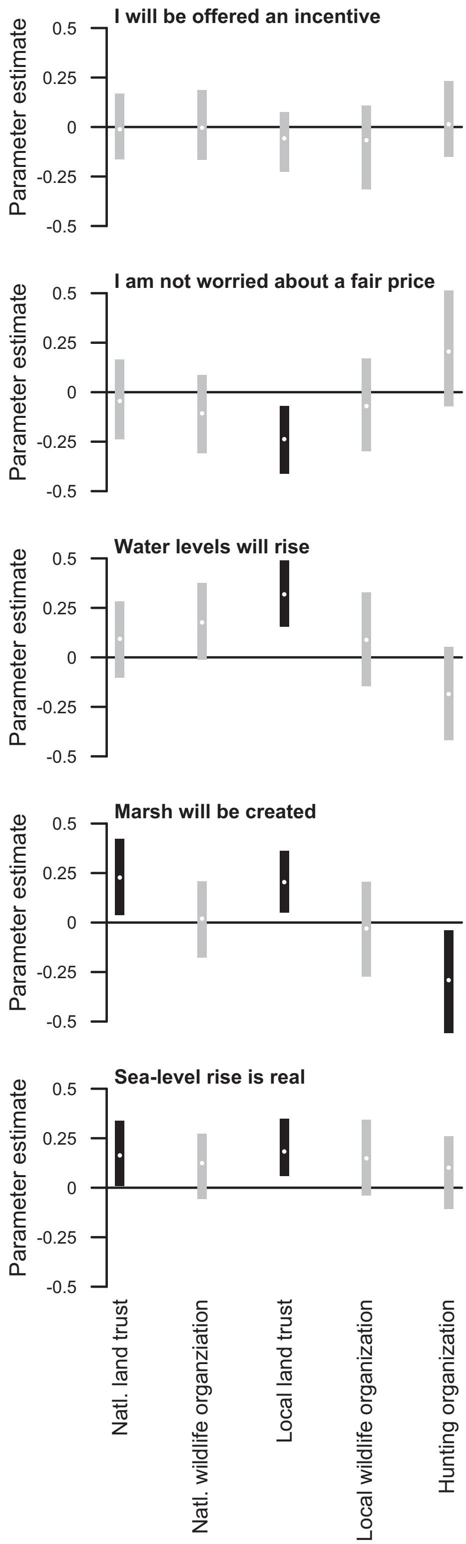

Fig. S3. The influence of environmental group membership on (from *Top* to *Bottom*) landowners' perceived likelihood of receiving an incentive, concern about receiving a fair price, belief that water levels will rise on their properties, belief that marsh will be created on their property, and belief that sea-level rise is real. Bars are 95% credible intervals, and white dots are posterior means. Credible intervals that do not overlap zero indicate an effect of group membership and are shown in black.

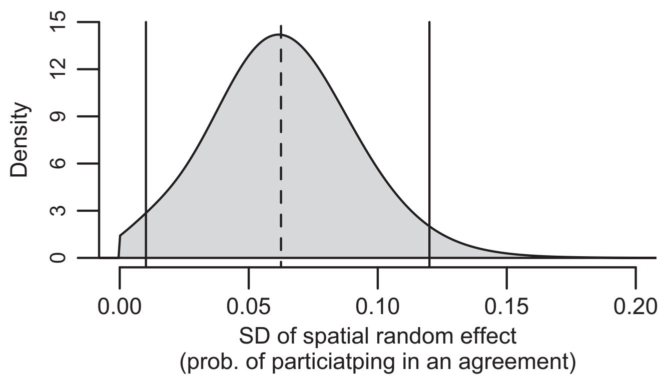

Fig. S4. Statistical evidence for spatial variation in landowner intentions to participate in one of the conservation agreements presented vs. not participating in any. The plot shows the SD of the variation among respondents in different geographic locations (i.e., the SD of the spatial random effect). The distance of the peak (dotted vertical line) and 95% credible intervals (solid vertical lines) of this distribution provide a measure of the strength of spatial variation.

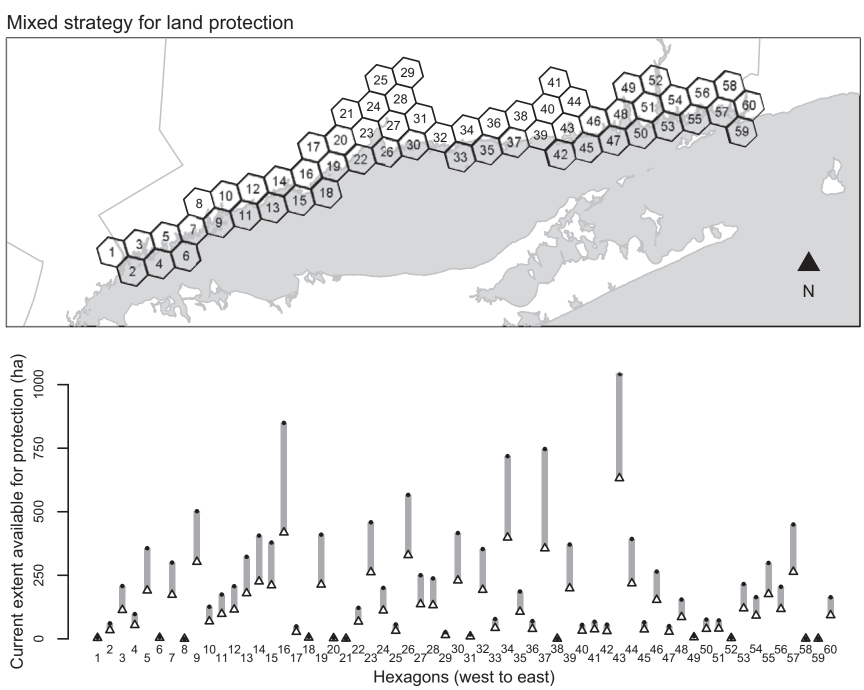

Fig. S5. The estimated effect of behavioral intentions on the extent of the marsh migration zone that is available using a mixed strategy in which every landowner is offered their most preferred agreement. (*Upper*) The locations of hexagonal planning units that were used to summarize the spatial extent of the marsh transgression zone and spatial variation in behavioral intentions. Numbers reference the bars in the lower panel. (*Lower*) The estimated extent of the marsh migration zone that is available for land protection. Closed circles show the hexagon-specific extent of the marsh migration zone. Open triangles show the extent after accounting for the proportion of landowners who reported being likely to participate in one of the agreements presented. The scenarios are connected by gray bars to aid in visualizing the differences between them. Numbers below the points refer to the hexagon numbers in the upper panel.

Table S1. Independent variables for analyses of behavioral intentions

Question	Question shorthand	Variable scale	Variable name	VIF	Proportion missing
Q24A	National land trust member	Indicator	natland	1.46	0.00
Q24B	National wildlife conservation organization member	Indicator	natwild	1.32	0.00
Q24C	Local land trust member	Indicator	localland	1.35	0.00
Q24D	Local wildlife conservation organization member	Indicator	localwild	1.18	0.00
Q24E	Hunting/fishing organization	Indicator	hunt	1.13	0.00
A	Assessed property value	Continuous	assval	1.15	0.04
Q1	Is property primary residence?	Yes/no	primres	1.15	0.07
Q21	Gender	Indicator	gend	1.24	0.08
Q22	Age	Continuous	age	1.23	0.10
Q23	Level of formal education	Ordinal	edu	1.25	0.04
Q25A	Republican	Indicator	repub	1.28	0.08
Q25B	Democrat	Indicator	dem	1.36	0.08
Q6A	Water levels will rise on property	SU–SL (1–5)	floodbelief	2.26	0.07
Q6B	Marsh will be created on property	SU–SL (1–5)	newmarshbelief	2.13	0.08
Q14B	Sea-level rise is happening	VSN–VSY (1–10)	SLRisreal	1.16	0.03
Q10A	I will receive an incentive	SA–SD (1–5)	incent	1.11	0.10
Q17	Worried about receiving fair price	SA–SD (1–5)	fairprice	1.14	0.13
B	Property size	Continuous	acresGIS	1.27	0.43
C	Distance to current tidal marsh	Continuous	marshdist	1.27	0.00
Q4	Flooded during Hurricane Sandy?	Indicator	sandy	1.22	0.08
Q12	Current shoreline protection	Yes/No	protected	1.54	0.08
Q20F	A home for wildlife is important	NI–EI (1–5)	wildlifehome	1.69	0.09
Q20A	Marshes providing protection is important	NI–EI (1–5)	floodprotect	1.45	0.09

From left to right, the associated survey question number, shorthand for the question that was asked, the type of scale used to measure the variable, the name used to refer to the variable in the model code, variance inflation factors (VIF), and the percent of respondents who did not answer the question. Complete questions are given in the questionnaire (*SI Appendix*). EI, extremely important; NI, not at all important; SA, strongly agree; SD, strongly disagree; SL, strongly likely; SU, strongly unlikely; VSN, very sure it is not happening; VSY, very sure it is happening.

Other Supporting Information Files

SI Appendix (PDF)
Dataset S1 (DOCX)