Title: Perceptions of naturalness predict U.S. public support for soil carbon storage as a climate solution

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Supplementary Material

This supplement contains: 1) Supplemental Table S1, which depicts results of expanded regression models containing additional predictor variables (Belief in Anthropogenic Climate Change and select interaction terms); 2) Supplemental Table S2, which depicts a correlation matrix for key study variables; and 3) Supplemental A, which depicts the descriptions of the Carbon Dioxide Removal strategies presented to respondents.

Following prior research (e.g., Wolske et al. 2019), some of text and images comprising the descriptions shown in Supplemental A were adapted from an article by Meko (2016) appearing in The Washington Post (https://www.washingtonpost.com/graphics/national/carboncapture/), namely those for Afforestation and Reforestation, Bioenergy plus Carbon Capture and Storage, and Direct Air Capture, as well as from Campbell-Arvai et al. (2017). Descriptions and images for Soil Carbon Storage and Soil Carbon Storage with Biochar were created to match that format, in consultation with members of our authorship team with expertise in soil carbon sequestration.

Supplemental Table S1. Summary of weighted regression coefficients (Beta (*B*) and Standard Errors (*SE*)) depicting significant predictors (*$p \leq .05$; **$p \leq .01$; ***$p \leq .001$) for Support for Carbon Dioxide Removal (CDR) strategies: Afforestation and Reforestation (AR); Bioenergy plus Carbon Capture and Storage (BECCS); Direct Air Capture (DAC); Soil Carbon Storage (SCS); and Soil Carbon Storage with Biochar (SCSB). In addition to the predictors appearing in the main regression models (see Table 3 of main text), this model incorporates Belief in Anthropogenic Climate Change (with "more by natural changes in the environment" treated as the referent category) as well as select interaction terms. PNAT, ATN, and Pol Ideo were mean-centered prior to computing interaction terms.

	AR		**BECCS**		**DAC**		**SCS**		**SCSB**	
Main Effects	***B***	***SE***	***B***	***SE***	***B***	***SE***	***B***	***SE***	***B***	***SE***
Perceived Naturalness (PNAT)	**.222****	.080	**.168***	.082	**.371*****	.097	**.434*****	.091	**.243***	.105
Aversion to Tampering with Nature (ATN)	.019	.036	-.064	.038	**-.105****	.040	**-.097***	.039	**-.127****	.041
Political ideology (Pol Ideo)	**.261*****	.077	-.113	.068	-.022	.108	.043	.091	-.002	.083
Belief in Anthropogenic Climate Change										
Caused more by humans	**.482*****	.125	.142	.104	.222	.121	**.490*****	.120	**.329****	.116
Caused by humans and nature equally	**.323***	.130	**.246***	.109	.119	.124	**.497*****	.128	**.314****	.120
Education (EDU)										
High school degree/GED	.264	.150	-.137	.137	.194	.172	.381	.17	**.438****	.148
Some college	.144	.155	**-.323***	.138	-.137	.173	.199	.17	**.359***	.153
Bachelor degree or above	**.308***	.152	**-.339***	.137	-.066	.170	.404	.167	**.358***	.151
Sex	-.039	.072	-.025	.072	-.019	.079	.017	.079	**.166***	.079
Age	-.001	.002	**-.011*****	.002	**-.008*****	.002	-.005	.002	-.004	.002
Interaction Effects										
PNAT x ATN	.011	.027	-.002	.023	-.04	.029	.053	.026	.035	.029
PNAT x Pol Ideo	.008	.020	**.067*****	.019	-.004	.023	-.005	.022	-.021	.023
PNAT x Mostly humans	.095	.091	**.324*****	.090	.025	.108	-.066	.100	.106	.115
PNAT x Both equally	.112	.097	**.357*****	.101	-.035	.110	-.021	.112	-.049	.124
EDU x Pol Ideo										
HS/GED x Pol Ideo	**-.263****	.087	-.012	.082	-.026	.116	-.038	.108	-.075	.092
Some college x Pol Ideo	**-.312*****	.088	-.003	.082	.002	.118	-.107	.103	-.079	.097
BA or above x Pol Ideo	**-.242****	.088	.055	.080	-.124	.115	-.099	.101	-.010	.093

Supplemental Table S2. Kendall's Tau rank correlation coefficients for key study variables.

Variable	1.	2.	3.	4.	5.	6.	7.	8.	9.	1.	11.	12.	13.	14.	15.	16.
1. AR Support	–															
2. BECCS Support	-.033	–														
3. DAC Support	-.055	**.329****	–													
4. SCS Support	**.280****	**.145****	**.204****	–												
5. SCSB Support	**.223****	**.254****	**.133****	–	–											
6. AR Perc. Nat.	**.405****	-.076	**-.104****	**.100****	**.134****	–										
7. BECCS Perc. Nat.	-.067	**.405****	**.121****	.047	**.078***	.039	–									
8. DAC Perc. Nat.	**-.127****	**.233****	**.309****	.062	**.130****	.004	**.429****	–								
9. SCS Perc. Nat.	**.147****	**.087***	**.083***	**.418****	–	**.230****	**.201****	**.148****	–							
10. SCSB Perc. Nat.	**.103***	**.150****	.023	–	**.332****	**.193****	**.271****	**.202****	–	–						
11. ATN	-.032	**-.165****	**-.145****	**-.107****	**-.209****	**-.088****	**-.222****	**-.221****	**-.136****	**-.315****	–					
12. Anthro. CC Belief	**.232****	.042	**.132****	**.203****	**.183****	**.235****	-.004	.019	**.155****	.061	**-.053***	–				
13. Political Ideology	**-.068***	**-.143****	**-.165****	**-.147****	**-.139****	**-.066***	**-.076****	-.05	**-.116****	**-.078***	**.128****	**-.326****	–			
14. Education	**.163****	-.028	-.047	**.166****	**.109****	**.195****	.024	-.007	**.176****	**.138****	**-.143****	**.152****	**-.118****	–		
15. Sex	**-.066***	-.033	**-.079***	-.062	.062	-.046	-.035	**-.157****	**-.082***	-.007	**.103****	-.026	-.043	.034	–	
16. Age	.017	**-.089****	**-.115****	-.015	.005	**.093****	.022	-.048	.019	**.077****	-.039	**-.127****	**.081****	**.090****	.037	–

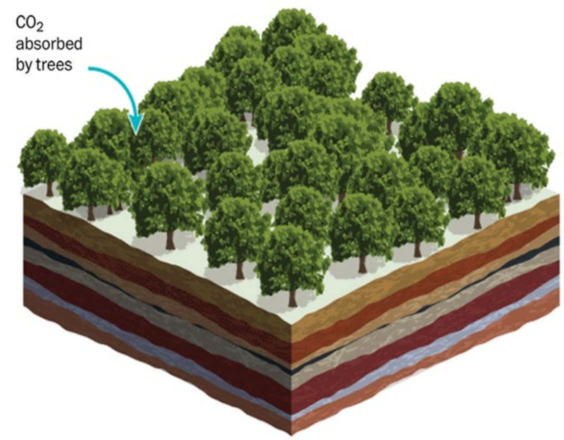
Note: Significant associations are denoted at the $^{*}p < .05$ and $^{**}p < .01$ levels (two-tailed). For Support, Perceived Naturalness, Anthropogenic Climate Change Belief, and Aversion to Tampering with Nature (ATN) Score, higher values correspond to stronger levels of the construct. Political ideology is coded 1=Very liberal to 7=Very conservative; Education (4-category) is coded 1=Less than high school, 2=High school equivalent, 3=Some college, 4=Bachelor degree or above; Sex is coded 1=Male, 2=Female; Age is reported in years. Weighted coefficients.

Supplemental A

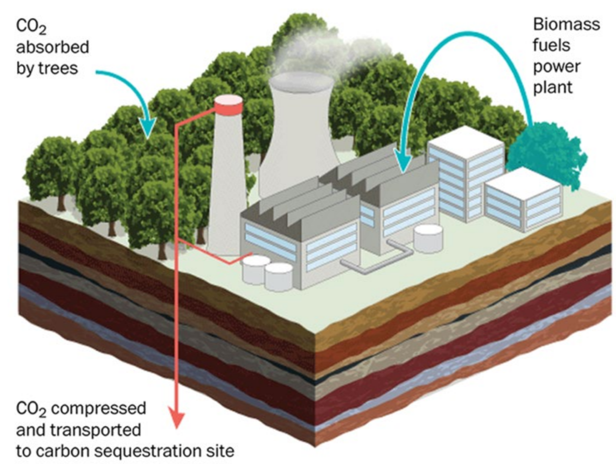
This section contains the brief descriptions of the carbon dioxide removal strategies, which were presented to respondents before they answered the questions comprising the key study measures of perceptions of naturalness and policy support. Respondents saw one of the two versions of the soil carbon storage strategies and two out of the remaining three strategies, selected at random and presented in a random order.

"Because climate change is caused mainly by too much carbon dioxide in the atmosphere, scientists and policy makers are interested in "carbon dioxide removal" strategies, which aim to slow or reverse climate change. A number of such strategies have been proposed. Next, we will describe three carbon dioxide removal strategies and ask for your opinions about each one."

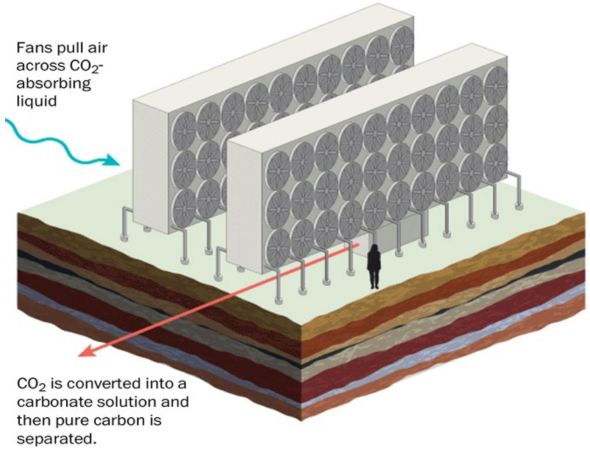
Afforestation and Reforestation:
Afforestation means planting trees where there were none before and reforestation means replanting trees where forests have been cut down or damaged. As trees grow they absorb carbon dioxide from the air and can store it for decades. Because mature trees absorb less carbon than young ones, trees would continuously be planted in new locations. This strategy can also improve water and air quality and has biodiversity benefits. However, afforestation and reforestation require a lot of land, which could compete with agricultural production.



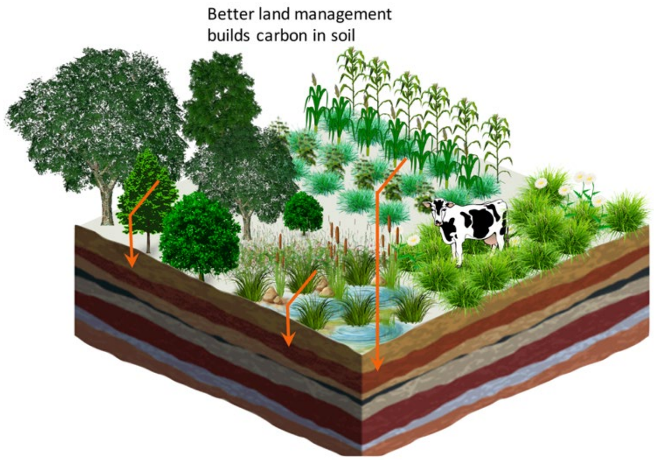
Bioenergy plus carbon capture and storage:
Bioenergy plus carbon capture and storage involves growing and harvesting plants for a fuel source. As the plants grow, they absorb carbon dioxide from the air. When the plants are harvested and burned the carbon released is captured through carbon capture and storage. Carbon capture and storage absorbs the carbon dioxide through a chemical process and the carbon is then piped deep underground where it can be stored indefinitely. This strategy can provide energy for homes and businesses. However, bioenergy and carbon capture will require a lot of land and water, which could compete with agricultural production.



Direct Air Capture:
Direct air capture works by passing air through a number of very large fans where carbon dioxide sticks to a special liquid and is absorbed through a chemical process. The carbon is then piped deep underground where it can be stored indefinitely. This strategy can also use the captured carbon in chemical processes to make products like plastics. Though direct air capture does not require a lot of land, it will require a lot of energy and is a high cost carbon dioxide removal strategy.



Soil Carbon Storage:
Soil carbon storage uses land management techniques to store carbon dioxide in Earth's soils. One soil carbon storage strategy is to manage land, such as farm and grazing lands, forests, and wetlands, in ways that store more carbon in the soil and keep it out of the atmosphere. This strategy also improves water quality and is good for growing crops because it improves soil quality. Though soil carbon storage will not require more land or water, it will require investments in technologies that will help manage land better.



Soil Carbon Storage with Biochar:
Soil carbon storage uses land management techniques to store carbon dioxide in Earth's soils. One soil carbon storage strategy is to manage land, such as farm and grazing lands, forests, and wetlands, in ways that store more carbon in the soil and keep it out of the atmosphere. Another strategy for storing soil carbon is to use heat to convert unused plant material or manure into a form of charcoal called biochar. Biochar is then mixed into the soil, which stores the carbon for a long time. These strategies also improve water quality and are good for growing crops because they improve soil quality. Though soil carbon storage will not require more land or water, it will require investments in technologies that will help manage land better and facilitate the creation of biochar.