American Conservation Coalition

FROM TREE TO SHINING SEA

The Enormous Potential of Natural Climate Change Solutions

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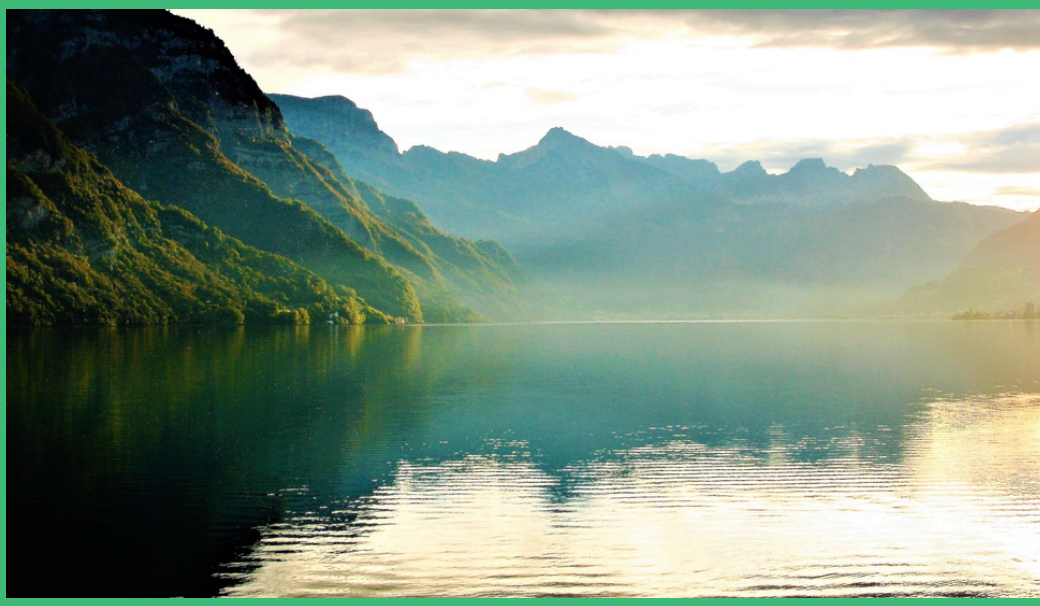

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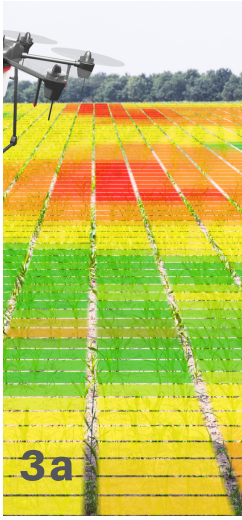
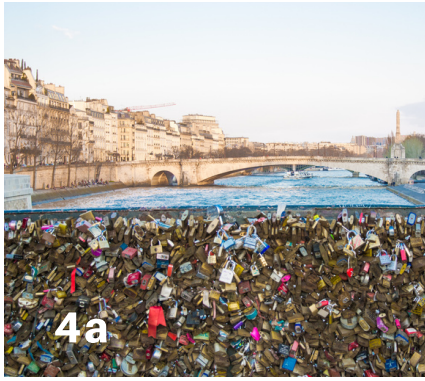




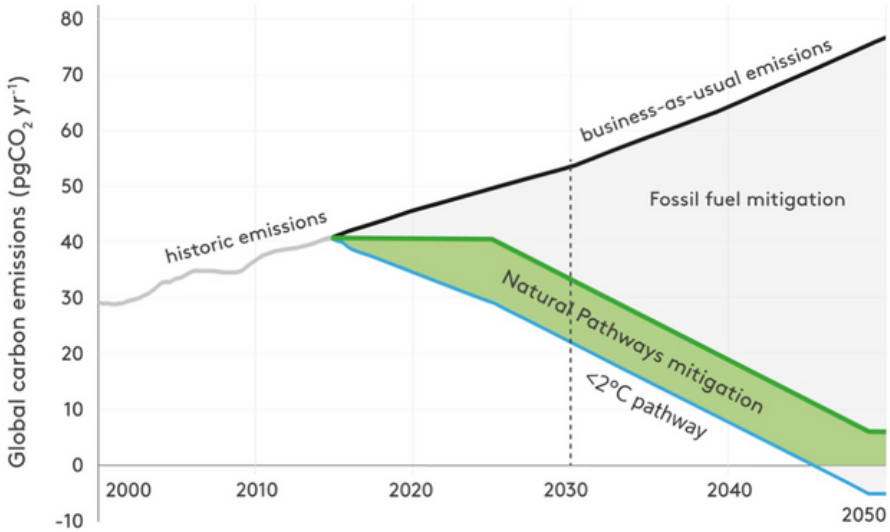
1. INTRODUCTION

Climate change is one of the most significant challenges of the 21st century. Due to greenhouse gas emissions, global temperatures are rising faster than normal, which will have far-reaching consequences for the planet. Increasingly erratic weather patterns, rising sea levels, failed harvests, and other climate-related issues will directly affect the health and prosperity of the United States and the world. The United Nations Intergovernmental Panel on Climate Change (IPCC) calls for global net zero greenhouse gas emissions by 2050 in order to limit global temperatures to 1.5 °C above pre-industrial temperatures.

Increasingly, governments around the world are looking for the best and most effective solutions to mitigate climate change; however, this debate often gets reduced to renewable energy vs. fossil fuels, electric cars vs. gasoline cars, or energy efficiency vs. energy waste.

While these are certainly crucial aspects of reducing our carbon emissions, we cannot overlook another strategy for significant emissions abatement: natural climate change solutions. Where energy solutions help us reduce the emissions we release into the atmosphere, nature can help us remove existing emissions directly from the atmosphere, a process called natural carbon sequestration. Indeed, nature is the original carbon capture machine, pulling CO2 out of the atmosphere and storing it in trees, oceans, soils, and many other natural resources. As such, the concept of natural climate change solutions refers to the enormous potential of natural landscapes to directly remove our carbon emissions from the atmosphere and the practices we can implement to harness this unique capability.

Currently, more than a quarter of global emissions come from forestry, agriculture, and land-use changes. Yet, according to a report published by the Proceedings of the Natural Academy of the Sciences (PNAS), nature-based solutions can account for 37% of all emissions reductions required by 2030, as called for by the IPCC.



Source: Contribution of natural climate solutions (NCS) to stabilizing warming below 2°C. © TNC

Whereas clean energy solutions, although absolutely vital, require enormous amounts of investment, construction, and modernization, natural climate solutions provide some of the most cost-effective means for rapidly reducing net greenhouse gas emissions.

As a result, these nature-based solutions can attract significant levels of bipartisan support. Apart from the climate benefits of reducing carbon emissions, natural solutions provide huge economic opportunity, leverage private-sector investment, engage rural communities, and conserve some of America's most beautiful landscapes and ecosystems.

This report will explore some of the natural climate change solutions present in different ecosystems, from forests to coastal areas. Each section breaks down the natural carbon sequestration characteristics of these different landscapes, outlines the measures we need to take in order to harness those characteristics, and addresses the ways in which this will enable us to both mitigate the worst effects of climate change and simultaneously adapt to some of its inevitable consequences. Furthermore, we will address the unique position of agriculture in this conversation, given its close interaction with natural ecosystems and subsequent potential for further carbon sequestration. Finally, we will explore the role that the United States can play on the international stage in order to incentivize more effective natural climate change solutions both at home and around the world.

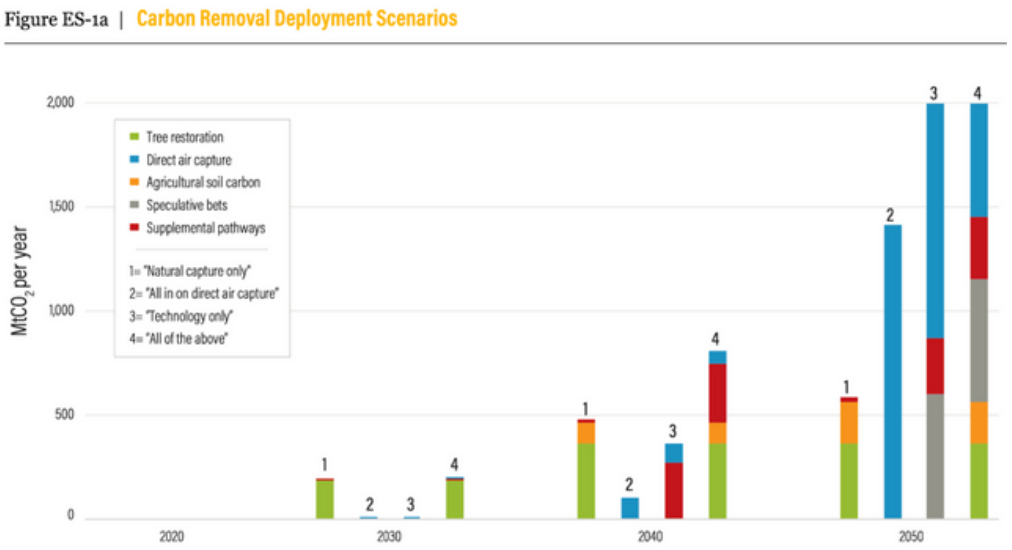
Ultimately, as policymakers explore policy avenues aimed at reducing our carbon footprint, natural climate solutions must be at the center of such efforts. Lying at the intersection of climate mitigation, climate adaptation, and ecosystem revitalization, the benefits of natural carbon sequestration are unparalleled.

2. ECOSYSTEM RESTORATION

a. Trees

Trees are the poster image of nature-based climate solutions for good reason. Forests are one of the first lines of defense in the battle against climate change because of their unique carbon sequestration potential. In 2018, global tree cover removed 37.1 metric tons of CO2 from the atmosphere, or around 30% of combined emissions that year. The United States' 766 million acres of forestland removes around 16% of American emissions per year. Yet simultaneously, deforestation accounts for 8 to 10% of CO2 emission increases globally. Reversing the trend of deforestation, and concerted efforts at afforestation – which is the process of planting more trees – will be crucial to reducing emissions both in the United States and abroad.

The potential is enormous. Apart from transitioning to cleaner energy sources, and taking into account current rates of natural carbon sequestration, the United States Mid-Century Strategy for Deep Decarbonization forecasts that a further two gigatons (two billion) metric tons of CO2 will have to be removed from the atmosphere each year by 2050 in order to hit net zero targets nationally. Fortunately, the World Resources Institute estimates that strategic tree restoration alone – without displacing agriculture – can meet roughly 20% of that target, or 360 million metric tons per year. In fact, actively pursuing afforestation and preventing deforestation accounts for more than two-thirds of "cost-effective" carbon reduction potential required to keep global temperatures below 2 °C, for as low as $10 per ton of carbon.



The figure above shows the need for tree restoration in the short term as newer carbon capture technology develops.

Source: WRI: Carbonshot: Federal Policy Options for Carbon Removal in the United States

i. Community Impact

The benefits of tree conservation and restoration projects are not limited only to positive climate impacts. In both cities and rural areas, they also foster closer community engagement, improve public health, encourage more outdoor recreation, stimulate social interaction, and beautify both urban and rural areas. Moreover, evidence shows that tree planting and forest maintenance could create up to 150,000 new jobs. That is three times as many jobs as the logging industry currently supports at a rate of forty jobs per $1 million investment, compared to five for oil and gas. The evidence also shows that an investment totaling around $4.5 billion would yield $6-$12 billion in annual economic growth, tripling the initial investment. Supporting and drawing attention to the economic prospects of tree restoration might already serve as a significant incentive for local communities to undertake such efforts. This high return on investment should also prompt federal policymakers to consider effective funding mechanisms for tree restoration, especially in light of putting Americans back to work amid the COVID-19 pandemic.

ii. Policy Avenues

While the federal government certainly plays a key role in a national tree strategy, it is important to recognize that 56% of forestland in the U.S. is privately owned, and that 90% of additional carbon sequestration potential from trees resides is on private land, with the remaining 10% on public land. As such, the most direct route to widespread reforestation starts in local communities and private capacities. It should be the primary goal of any policy on this matter to give as many resources to local communities as possible, and empower these communities to take ownership of their climate mitigation efforts. Policies must not only stimulate private and community investment and engagement, but also devolve authority for the execution of these projects to state and local governments, leveraging their on-the-ground knowledge.

Aside from direct federal investment, Congress should consider incentive-based tree restoration policies. For example, in the mold of currently existing conservation easements, which grant property owners significant tax deductions in return for conservation commitments, Congress should explore the possibility of an explicitly carbon-reduction-based tax easement. The current 45Q tax credit, which almost exclusively applies to Carbon Capture & Storage (CCS) equipment at facilities, could be extended to cover all carbon-reducing projects, including tree restoration. This would maximize the amount of privately-held land put toward carbon-reduction purposes, and actively encourage greater reforestation activities. More landowners opting for this path would therefore contribute not only to significant job creation, but also leverage widespread private-sector buy-in for tree restoration. Such an approach, however, must include careful consideration of verification mechanisms to ensure a transparent link between the amount of carbon abated and the size of the tax deduction.

Finally, the federal government should also consider creative alternatives such as a competitive grant program that requires federal tree restoration grants to be matched by private and local government investment. Such an approach would also leverage greater private-sector investment and promote fiscal sustainability since private and localized donors will ensure that any project they fund is both worthy of investment and as cost-efficient as possible.

As the World Resources Institute concludes: “A new tax credit, direct payment program, and/or state grant program to underwrite tree restoration in targeted areas over the next 20 years could be one of the most powerful carbon removal measures through 2050.”

iii. Wildfire Management

Wildfires and forest mismanagement are among the largest contributors to forest loss. In 2020, more than 10.3 million acres of forestland was lost to wildfires, more than double the rate of 2019. Apart from ravaging landscapes and communities, fires release carbon formerly stored in the forests. Last year, fires in California alone released 93 million metric tons of CO_2.

It is therefore necessary to not only restore and plant forests, but also to maintain them. The primary method by which wildfire management occurs is prescribed fires, also known as controlled burns. Many are skeptical of controlled burns, because they appear to "destroy" nature and release emissions that were formerly stored. However, scientific data indicates that in the summer immediately following prescribed spring burns, renewed carbon uptake was already 79% of pre-burn levels, and it only takes two to three years for the forest to re-accumulate the carbon that was released by the burn. In the meantime, much more serious fires are prevented that would potentially release far larger amounts of carbon in an uncontrolled manner. One study concludes that the "initial increase in emissions is more than offset over time by the avoided impacts of wildfires." Allowing such burns to clear away dead and old trees revitalizes the landscape and removes a significant wildfire hazard.

Underbrush removal is another strategy for wildfire management. Leaving underbrush uncontrolled not only increases the available fuel for wildfires, but also negatively impacts the health of forests that might become more susceptible to disease and infestation. Considering that 65% of wildfires occur on federal lands, federal policy must reflect a renewed commitment to removing excess underbrush and to carrying out controlled burns. Moreover, local and state governments must be given greater authority, responsibility, and resources to adequately manage the forests within their communities.

iii. Wildfire Management (cont.)

Climate mitigation impact: Tree restoration, forest conservation, and urban greening provide the largest combined source of potential natural carbon sequestration. By significantly reducing net carbon emissions, trees can therefore play a crucial role in mitigating the effects of climate change, both in the U.S. and globally.

Climate adaptation impact: Trees also play a significant role in helping us adapt to the effects of climate change. Planting tree species more acclimated to a warmer climate will increase our ecosystem resiliency and continue to provide habitat for many animal species. Moreover, trees in urban areas contribute to shading and reducing built-environment heat traps, thereby providing significant public health benefits.

Key forms of tree restoration and conservation:

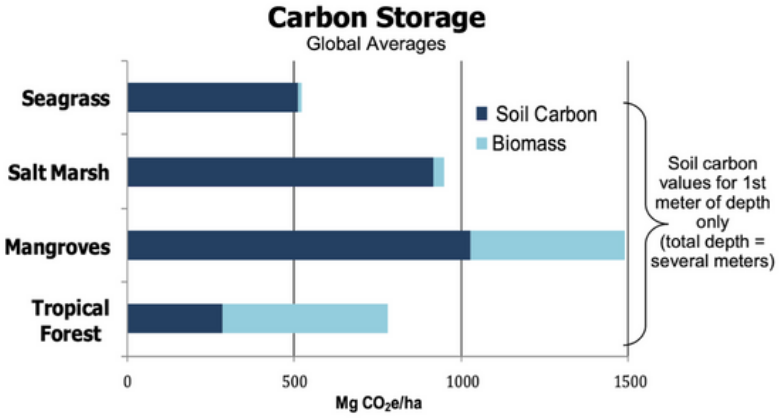
- Reforestation: planting trees where they were formerly present but were removed due to land-use changes, wildfires, or other reasons
- Conservation: protecting existing forests from deforestation
- Silvopasture and agroforestry: planting trees in livestock pastures without diminishing livestock production, and planting more trees on croplands such as between fields
- Urban reforestation: planting more trees in urban areas, such as along roads or in parks
- Natural forest management: pruning or removing some trees to encourage greater growth in the forest as a whole
- Wildfire management: clearing brush, implementing controlled burns, etc. specifically to prevent severe wildfires that ravage entire forests

B. BLUE CARBON

Blue carbon refers to the natural carbon sequestration potential of coastal and oceanic ecosystems. While most climate restoration efforts focus primarily on land and forest management, our oceans absorb about 25% of the world's carbon emissions. And while representing only 2% of total ocean surface area, coastal habitats account for half of that carbon sequestration. Unfortunately, these habitats are under threat, with up to 67% of some areas already lost around the world. Maintaining the current rates of loss could release up to one billion metric tons of CO2 per year, in a worst-case scenario, at a surface-to-carbon ratio between two and four times larger than that of tropical rainforests. A robust natural solutions framework must therefore include efforts to protect and restore oceanic habitats.

a. Coastal Landscapes

The potential of blue carbon lies in the nation's estuaries, salt marshes, and mangroves. According to Restore America's Estuaries (REA), these coastal landscapes have the capacity to store up to 233 million tons of CO2 per year, and have carbon sequestration rates that are ten times higher than forests on an acre-for-acre basis.



The graphic above visualizes the carbon sequestration potential of coastal ecosystems.

Source: Coastal Blue Carbon

To put this into perspective, losing 2.5 acres of coastal wetlands releases the same amount of carbon as losing 25 acres of native forest. For example, one study of the Snohomish estuary in Washington State found that full restoration of that single ecosystem could result in 8.9 million tons of CO2 sequestered over the course of 100 years. The importance of coastal ecosystems is immense in maximizing our natural carbon sequestration potential.

Moreover, coastal ecosystems play a crucial role in mediating the impacts of coastal erosion, extreme weather events, rising sea levels, and severe flooding, all of which are exacerbated by climate change. For example, mangrove forests reduce flooding in significant ways, and can reduce wave height by up to 66% per 100 metres of mangroves. A recent study shows that without mangroves in places such as Florida, the cost of flood damage would increase by $65 billion per year and directly expose an additional 15 million people to flooding hazards. Coastal prairies in Texas or wetlands in Louisiana have similar flooding mitigation impacts.

b. Research

One of the obstacles to fully harnessing the potential of blue carbon is the relative lack of expertise and available data on the issue. Expanding research into the natural carbon sequestration opportunities of these habitats is an important first step. Taking inventory of these ecosystems and creating a national database is an important prerequisite to any long-term conservation projects, as well as identifying where such restoration efforts would be most effective. Similarly, it will be important to produce economic analyses of how restoration programs will generate local economic activity and create new jobs. However, this is only the first step in protecting our crucial coastal and oceanic ecosystems and ensuring their maximum sequestration potential. Future policy priorities should prioritize the restoration and maintenance of coastal wetlands such as salt marshes, mangroves, and estuaries.

c. Policy Avenues

Like policies designed to address tree restoration, lawmakers should pursue an array of policies to restore our coastal ecosystems and ensure their maximal carbon sequestration potential. Aside from direct funding, policies such as competitive matching grants and conservation easements can leverage private investment and community engagement.

Ensuring private-sector input and buy-in is particularly important given the unique position of coastal communities in the fight against climate change. Housing associations, tourism agencies, insurance companies, and many other relevant stakeholders have a direct incentive to mitigate the impact of climate change on their communities, physical assets, and revenue streams. Any coastal restoration project must seek consultation with these stakeholders, leveraging maximum investment across all interested parties.

The preservation of coastal ecosystems is a policy issue particularly relevant to states such as Florida, Washington, Louisiana, California, and many more. As such, significant leadership must come from the state and local governments that are directly impacted by these issues. Any federal policy should therefore primarily seek to leverage the input and commitment of these regions.

Climate mitigation impact: Coastal landscapes represent a highly efficient form of natural carbon sequestration. With the ability to store ten times more CO2 than forests on an acre-for-acre basis, restoring the health of our coastal ecosystems is critical in reducing emissions to mitigate the worst impacts of climate change.

Climate adaptation impact: Coastal ecosystems also have significant climate adaptation benefits. They play a crucial role in protection from storm surges, flooding, rising sea levels, and coastal erosion - all issues that will become more prevalent as the climate continues to change over time. Protecting these landscapes will increase their resiliency under the threat of climate change, allowing them to continue providing habitat for wildlife, food security through fishing, and revenue for communities that rely on tourism.

C. OTHER ECOSYSTEMS

Efforts aimed at landscape restoration largely involve reforestation and protecting coastal ecosystems. However, numerous other landscapes also play a key role in natural carbon sequestration. Landscapes such as grasslands, peatlands and marshes (both forms of inland wetlands), moorlands, and tundra all store significant amounts of carbon. Rivers, streams, and lakes also play a crucial role because they collect much of the carbon that seeps from soils in places such as forests, fields, or grasslands into the nearest source of water. Researchers estimate that rivers and streams transport and store an average of 220 billion tons of CO2 every year, most of which ends up in the ocean.

Grasslands in particular represent a critical biome with significant carbon sequestration potential. Estimated to cover approximately 26% of the world's land surface, grassland soil stores 20% of the world's carbon. In the United States, grasslands covered around 60% of land acreage in 1948, but that has dropped precipitously to just 5% today due to development projects, encroachment of woody vegetation, and agricultural expansion. Currently, grassland loss in the U.S. is occurring at a greater rate than Amazon deforestation. In an effort to reclaim some of these lost grasslands, the 1985 Farm Bill established the Conservation Reserve Program (CRP). This program incentivized agricultural land owners to commit ecologically valuable plots of land toward the planting of long-term native grasses. Since then, the CRP has resulted in the planting of permanent grassland covers on over 32 million acres.

In order to build on the foundations laid by programs such as CRP, Congress should consider more ways to restore these various landscapes across the country. For example, any tax benefits that extend to forests and coastal ecosystems should equally apply to these other types of landscapes. This would ensure the leveraging of the natural carbon sequestration potential of America's diverse landscapes.

Climate mitigation impact: These types of landscapes play a crucial role in reducing our carbon footprint. Expanding the capacity of America's grasslands and wetlands as significant carbon sinks will further reduce emissions, while protecting waterways will ensure that a lot of this carbon is safely transported to the ocean rather than emitted into the atmosphere.

Climate adaptation impact: These landscapes also contribute to creating a complex network of ecosystems that stimulate biodiversity and wildlife conservation, as well as creating a more resilient environment capable of withstanding increasingly erratic weather conditions.

3. AGRICULTURE

The food and agriculture industry plays a vital role in meeting the nutritional needs of our nation, as well as supporting 22.8 million jobs (15% of total employment), and generating an economic output of over $2.1 trillion per year. By 2058, the U.S. population is expected to surpass 400 million people, which will require an increase in agricultural output rather than a decrease.

However, the agriculture industry also has a significant role to play in the fight against climate change as we target global net zero emissions by 2050. Through improvement and innovation in farming methods, agricultural land can become an increasingly important sink for natural carbon sequestration. While farmers have already developed and adopted many practices to increase yields while contributing to carbon sequestration, we must continue to support innovation. According to the U.S. Farmers & Ranchers Alliance, American agriculture could reduce emissions, with the appropriate investments, by up to 147%, thus becoming a significant net-negative carbon contributor.

Ultimately, agriculture has a central role to play in the fight against climate change, not only because of its natural carbon sequestration potential, but also because it is uniquely exposed to the consequences of a changing climate, from crop failures to erratic weather events. Agriculture should therefore be at the center of American mitigation and adaptation efforts to address climate change.

a. Agricultural Progress

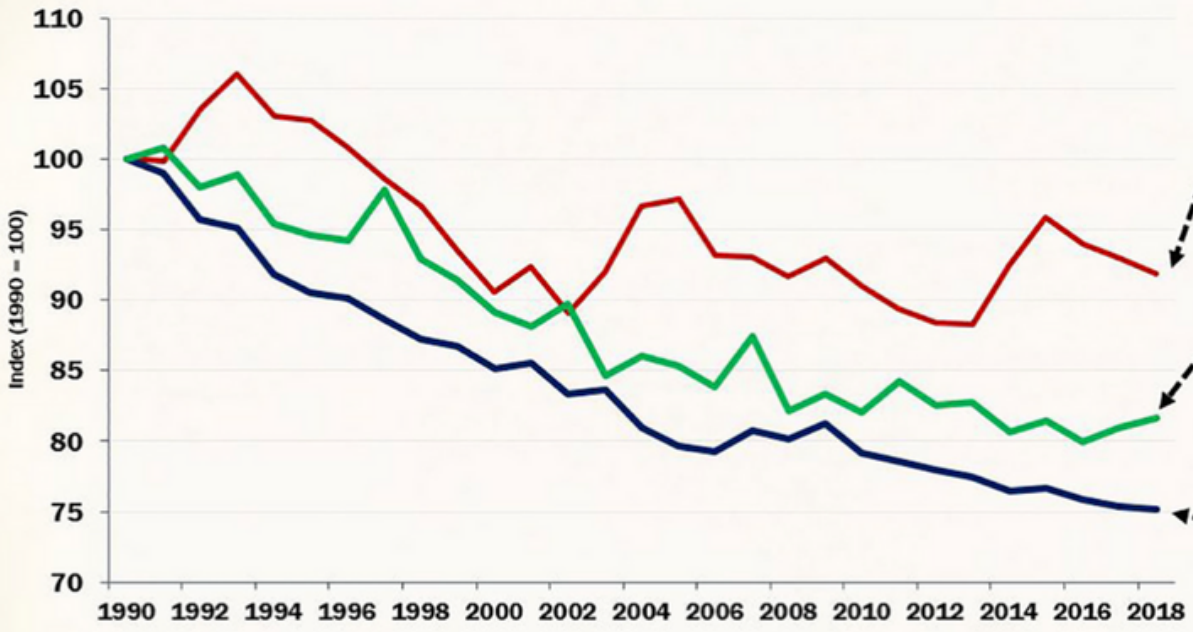
Agriculture has a direct environmental impact on soil health, water conservation, biodiversity, and greenhouse gas emissions. According to the Environmental Protection Agency, the industry accounts for roughly 10% of carbon emissions in the United States.

Today, significant progress has already been made. Emissions are decreasing as farmers and ranchers have shifted toward more efficient and sustainable practices. Since 1990, per-unit greenhouse gas emissions related to beef production have declined by 8%, milk-related product emissions have declined by 25%, and soybean-related product emissions are down nearly 20%.

Moreover, ranch and farm lands have seen a huge growth in renewable energy installations such as geothermal, solar panels, windmills, and methane digesters, with a more than 132% rise in clean installations over the last five years alone.

At this point, there are more than 130,000 farm and ranch operations in the U.S. that utilize some form of renewable energy. Additionally, as innovation and productivity continue accelerating, more land could become available for reforestation projects.

Figure 4. Index of Methane Emissions Per Unit of Production for Beef Cattle, Dairy Cattle and Swine, 1990 = 100



-8%
Beef
Emissions per unit of beef production have declined by nearly 8% since 1990, and was more than 10% lower in recent years

-18%
Swine
Emissions per unit of pork production have declined by more than 18% since 1990

-25%
Dairy
Emissions per unit of milk production have declined by nearly 25% since 1990

AMERICAN FARM BUREAU FEDERATION®

Source: Environmental Protection Agency, USDA FAS PSD Online, Farm Bureau Calculations

b. Natural Carbon Sequestration

The predominant method for improving sustainable agriculture is through alternative farming practices. As the United States Department of Agriculture states, "These practices include switching from conventional tillage to conservation tillage or no-till, reducing or eliminating fallow as part of planned crop rotations, switching from annual to perennial crops, increasing field residues through irrigation, fertilization, planting hay or cover crops, or using additional organic material, such as manure." In particular, supporting greater root health through improved tilling practices and planting crop varieties with larger root systems has the potential to remove up to 500 million tons of CO2 per year, although more research is needed to consider how practical this is and how it would impact yield.

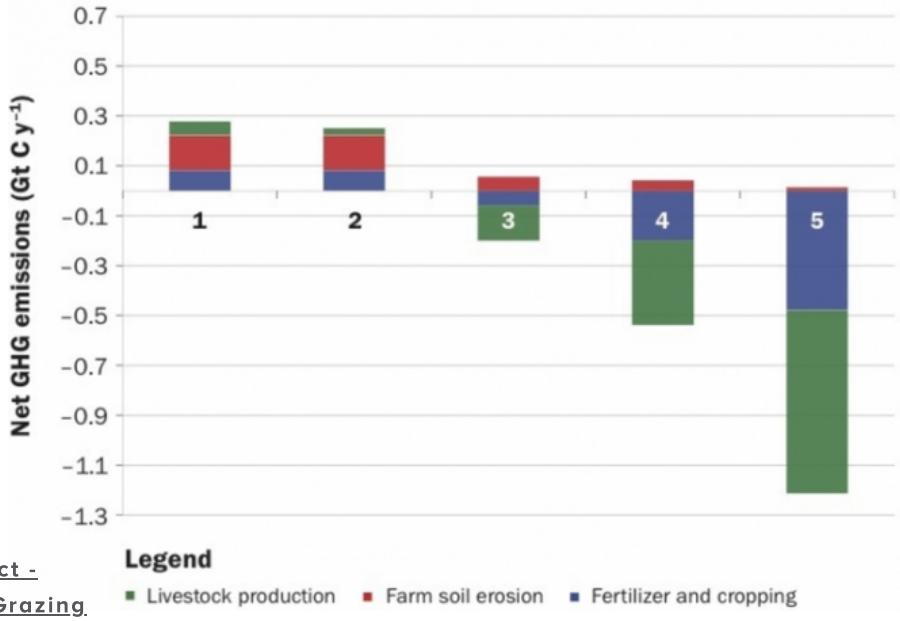
Importantly, these farming methods would not only benefit the climate by vastly expanding agriculture's carbon sequestration potential, but they would also significantly boost agricultural productivity and economic sustainability by ensuring long-term soil health, increasing crop resiliency, reducing erosion and runoff, and improving local water quality.

Aside from land use, the rearing of livestock, particularly sheep and cattle, also plays a significant role in greenhouse gas emissions, primarily through the animals' digestive processes and the decomposition of their manure, both of which release significant amounts of methane – a greenhouse gas 80 times more powerful than CO2 over a 20-year period. Together, these ruminants are responsible for 4% of all greenhouse gas emissions in the United States. One of the principal sources of livestock emissions is the large-scale concentrated animal feeding operations (CAFO). These operations emit air pollutants such as hydrogen sulfide, nitrogen, and phosphorus, as well as public health threats such as pathogens, nitrates, and heavy metals.

A fundamental change that can reduce livestock emissions is switching the feed given to the livestock. One example of this would be including additives such as seaweed or fats and oils, which can reduce methane emissions by 80% and 20% respectively. Another way that farmers can reduce livestock-emissions is by using manure digesters that capture the methane released during manure storage, and then using the methane to create renewable natural gas.

Figure 2

Hypothetical North American net greenhouse gas (GHG) emission scenarios for: (1) current agriculture; (2) current agriculture with 50% current ruminants; (3) 25% conservation cropping and adaptive multipaddock (AMP) grazing with current numbers of ruminants; (4) 50% conservation cropping and AMP grazing with current numbers of ruminants; and (5) 100% conservation cropping and AMP grazing with current numbers of ruminants.



Source: Land Stewardship Project - Carbon, Cattle & Conservation Grazing

c. Biotechnology

Biotechnology, which is the process of technologically altering biological organisms, presents significant opportunities to not only reduce the environmental impact of agriculture, but also vastly expand its productivity. Some of the benefits of biotechnology include:

- Designing crops that require no tillage, thus limiting carbon releases from the soil
- Enhancing the growth of crops with deeper root systems
- Creating products like the Impossible Burger that use up to 87% less water, 96% less land, and 89% fewer GHG emissions than a regular beef burger
- Engineering livestock feed that reduces methane emissions
- Altering plants to develop climate-adaptive traits, such as heat tolerance, drought tolerance, and salt tolerance

Moreover, there is a strong scientific consensus that these modified crops and organisms pose no negative health side-effects.

d. Policy Avenues

In order to fully maximize the natural carbon sequestration potential of agriculture, a variety of policy avenues must be considered. First, more research needs to be carried out to identify the most effective methods for carbon sequestration, and ensure that all agricultural practices rely on rigorous scientific data. In particular, farmers and ranchers will require significant technical assistance and expertise to capture these opportunities, and as such will benefit from government-commissioned research projects.

Second, policymakers should pursue incentive-based and voluntary tools for farmers and ranchers to implement innovative practices that reduce our carbon footprint, from tilling methods to on-farm renewable energy installations. Tax exemptions, competitive grants, and certification programs must be performance-based and aim to reward farmers who pursue such practices. Similarly to tree and coastal restoration projects, developing a mechanism for adequate verification of carbon-reduction activities will be crucial to attracting buy-in from the agricultural industry. Easier access to these potential revenue streams will better incentivize farmers and ranchers to further adopt sustainable practices.

Third, policymakers should embrace the transformative potential of technology. Investment in R&D, in the same mold as the Department of Energy's Advanced Research Projects Agency (ARPA-E), will unleash and fast-track further innovation in this area. Meanwhile, burdensome regulations and licensing processes should be streamlined in order to accommodate, rather than stifle, private-sector innovation.

Climate mitigation impact: By adopting the practices and policies described above, agriculture can act as a significant source of natural carbon sequestration. This will play a crucial role in fighting climate change, with evidence suggesting that nearly 6% of global carbon emissions and 50% of non-carbon emissions such as methane (which is far more powerful than CO2), could be abated as a result by 2050

Climate adaptation impact: Temperature and precipitation increases as a result of climate change will bring significant problems for agriculture and livestock farming. Crop failures, reduced yields, and diminishing food quality, alongside a growing population, will pose a large threat to our food security and supply chain. By implementing more sustainable practices that enhance soil heath, ensure maximal efficiency, and promote technological innovation, our agricultural systems can be made more resilient and able to withstand the effects of climate change.

4. GLOBAL ENGAGEMENT

The United States has a duty and responsibility to lead the world on climate action. Cutting our own emissions will not adequately address climate change if the rest of the world continues polluting. By leveraging diplomatic influence, economic clout, and cultural soft power, the United States can help set the world on a trajectory toward preventing the worst impacts of climate change, while increasing prosperity for all. Natural solutions must be a part of that diplomatic strategy, representing an area in which U.S. policy can significantly contribute to global emissions reductions. Indeed, ecosystems such as the Amazon Rainforest and coral reefs around the world act as significant carbon sinks with global significance for the fight against climate change. Protecting natural landscapes and restoring ecosystems has an important but limited impact on global warming if carried out by the United States alone. Scaling up nature-based solutions around the world will ensure that ecosystems beyond our borders are protected as well, and therefore capable of helping the U.S. in the global fight against climate change.

a. International Agreements & Beyond

While international treaties such as the Paris Climate Agreement act as a useful diplomatic forum for engagement with other countries, they often lack enforcement mechanisms and fail to hold other countries such as China accountable for their environmental practices. As the international community renegotiates the terms of global climate action, the U.S. can start by expanding bilateral and multilateral trade ties that incorporate a natural solutions focus. By leveraging trade talks to include natural carbon sequestration provisions, the U.S. would ensure that it uses its global economic clout to influence environmental policy in countries with significant potential for natural climate solutions. This would also encourage greater environmental standards in domestic markets.

Consider the following case study. In 2020, the European Union banned the use of palm oil in biofuels. In theory, this is a piece of green legislation, passed to reduce deforestation caused by palm oil production in countries such as Malaysia; in practice, however, the ban is likely to do more harm than good on an environmental level. By cutting the trade link, the EU is surrendering its influence over palm oil producers in other countries. Meanwhile, less environmentally-conscious markets such as India and China will ensure that palm oil production continues at high levels.

The U.S. decision, in contrast, should be to continue allowing the use of palm oil in biofuels, but only that which has been certified by the Roundtable on Sustainable Palm Oil (RSPO). The RSPO criteria forbid the clearing of primary forests or areas with significant concentrations of biodiversity, as well as requiring a reduction in pesticide use. This act would increase the value of sustainably-produced palm oil, creating a greater drive for farmers to be RSPO-certified, ultimately reducing the amount of deforestation caused by palm oil production.

b. The Environmental Track Record of U.S. Free Trade

Deforestation caused by palm oil is just one of a myriad of problems to be tackled. However, it demonstrates the value in engaging with these issues more carefully. Another example of free trade agreements and the environment being able to work together harmoniously was the signing of the Trade Act of 2002. This included comprehensive, legally-binding bilateral environmental provisions. For example, the US agreed to work with the government of Peru to address illegal logging, specifically mahogany harvesting. The U.S. used this framework to uphold and recommit to many previous successful conventions including the Convention on International Trade in Endangered Species, the Montreal Protocol on Ozone Depleting Substances, and the Ramsar Convention on Wetlands. Similar trade agreements with Panama, South Korea, and Colombia were put in place.

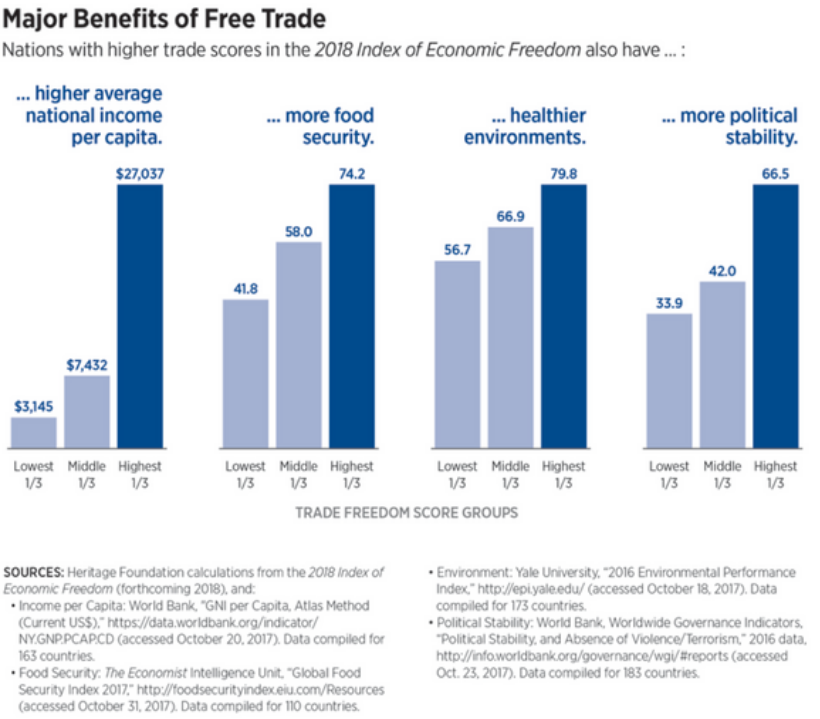
c. Case Study: Using Free Trade to Incentivize Natural Solution

A concrete example of how the U.S. could help foster natural climate solutions in other countries lies in Brazil, home to around 60% of the Amazon rainforest. Preserving the Amazon is crucial in the fight against climate change, considering its role as an enormous carbon sink that stores 5% of global carbon emissions annually. However, deforestation in the country is a growing concern, with the amount of rainforest lost accelerating by over 30% in recent years, while President Jair Bolsonaro has significantly loosened environmental regulations.

Naturally, the United States has an active interest in preventing deforestation of the Amazon rainforest, with its concomitant impacts on global climate change. The only way for the U.S. to exert any real influence over this, however, is through closer trade agreements and cooperation with Brazil.

The evidence is clear that free trade improves environmental outcomes, rather than worsens them. This is because richer nations tend to demand higher environmental standards, and the consumers from these countries increasingly seek out environmentally sustainable products. For example, Starbucks has responded to this consumer pressure by implementing blockchain technology that tracks the supply chain of coffee beans from farmer to customer, ensuring transparency and sustainability throughout the process. In this way, American consumers can apply pressure to Brazilian producers to source their products sustainably and without further deforestation as a result of free trade.

However, another more concrete way in which the United States can influence a country like Brazil to engage in natural solutions, such as rainforest conservation and reforestation, is by explicitly including these provisions in any trade agreement. For example, the U.S. could make rainforest conservation and reforestation projects a prerequisite for access to American markets, thus pressuring the Brazilian government to prioritize sustainability to reap the economic benefit of trade with America.



Source: Heritage Foundation - 2018 Index of Economic Freedom: Freedom to Trade is a Key to Pros

5. CONCLUSION

As the United States ramps up its efforts to fight climate change, natural solutions present some of the best opportunities for real progress. This report has emphasized the enormous potential for natural carbon sequestration within the landscapes, ecosystems, and waterways of the U.S. Moreover, the economic activity that would accompany such a natural solutions approach to climate change would create thousands of jobs, empower rural communities, and help the American economy recover from the devastation of the COVID-19 pandemic. This report has therefore explored several key issues.
First, trees present the single largest source of potential carbon sequestration, and forest conservation, restoration, and management are fundamental to a successful natural solutions strategy.

Second, coastal ecosystems also have significant sequestration potential, as well as occupying a unique role in our adaptation to the changing climate, by protecting coastal regions from flooding, erosion, sea-level rises, and unpredictable weather events.

Third, agriculture is not only a powerhouse of the American economy – and as a result a significant source of carbon emissions – but it also has the potential to become a net carbon-negative industry. By implementing practices such as planting cover crops, changing tilling methods, adding nutrients to livestock feed, and hosting clean energy installations,agriculture can play a central role in helping the U.S. reach net-zero. Moreover, advances in biotechnology can vastly reduce the ecological footprint of our food output, ramp up productivity, and increase the resilience of our supply chains in the face of a changing climate.

Fourth, natural solutions must be a feature of American climate diplomacy. While international agreements are far from perfect, they provide a platform for the U.S. to influence global policy-making, and raise the bar for solutions that actually work. Some of those solutions must take the form of natural carbon sequestration, and the U.S. can leverage bilateral and multilateral trade relationships to ensure high environmental standards across the world, consumer pressure for ecological sustainability, and close scientific partnerships. As we scale up natural climate solutions at home, we must export the best and most innovative practices to the rest of the world.

Furthermore, policymakers must pursue incentive-based, creatively-funded mechanisms that ensure stakeholder buy-in, leverage private investment, and devolve primary authority to state and local governments. While natural climate solutions are the most cost-effective tools in the fight against climate change, they must still be subject to fiscal scrutiny and responsibility. Building on the findings and conclusions of this report, a future policy framework should explore the viability of carbon markets. In short, carbon markets are voluntary platforms where businesses, consumers, or even governments can pay farmers, foresters, or other conservationists to implement projects that sequester carbon. In the context of the discussions contained within this report, establishing a revenue stream for natural carbon sequestration solutions would significantly boost U.S. efforts in the fight against climate change. Nevertheless, immediate steps can and must already be taken right now to harness the power of natural solutions.

Finally, nature-based climate solutions have garnered significant attention and support from lawmakers across the political spectrum. Indeed, as both Republicans and Democrats increasingly recognize the need for immediate action on climate change, natural solutions present a cost-effective, tangible, and promising avenue for bipartisan climate policy. Not only do they contribute significantly in the fight against climate change, but they also generate huge economic opportunity, engage both rural and urban communities, and protect America's beautiful landscapes.

Ultimately, the United States has a tremendous opportunity to tackle climate change in the very landscapes that define our country. By embracing the nature-based solutions described in this report, the U.S. can lead the world in reducing greenhouse gas emissions without sacrificing economic prosperity. Doing so will require concerted, bipartisan, and cooperative efforts from local communities all the way up to the federal government.N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