

New York Forests Provide a Natural Solution to Climate Change

KEY POINTS

1. Practical solutions that reduce global CO₂ levels are needed to address climate change.
2. Forests provide a natural climate solution by removing CO₂ from the atmosphere and storing carbon for long periods of time – these ‘negative emissions’ directly reduce climate risk.
3. Reforestation, avoided forest conversion, and natural forest management are proven strategies to reduce CO₂ while providing many other ecosystem services.
4. Forest lands in New York State have a greater capacity to reduce CO₂ than all of the state’s other natural and working lands combined.¹
5. SUNY ESF is leading efforts to assess the climate benefits of New York State’s forests.

HOW DO FORESTS PROVIDE CLIMATE SOLUTIONS?

- Carbon dioxide (CO₂) is the primary greenhouse gas responsible for climate change.
- Forests actively remove CO₂ from the atmosphere in a process called sequestration.
- Forests store this carbon in living trees, dead wood, leaf litter and soils. Carbon remains stored in these different forms for different lengths of time, from years to centuries.
- Carbon removed from the atmosphere and stored in forests does not contribute to rising CO₂ levels and climate change.
- By removing and storing carbon, forests provide ‘negative emissions’ that directly reduce climate risk.
- The amount of carbon sequestered and stored by a forest is determined by local conditions, including forest age, site quality, types of trees present, and disturbance history.
- Forest carbon benefits can be measured based on (1) changes in amount of forest land and (2) estimates of carbon sequestration and storage on those lands.
- Forests converted to other land uses (housing, agriculture) will lose carbon stored in soils and have less capacity for sequestration.
- In most cases, the conversion of forests to other land uses will create positive emissions of CO₂ to the atmosphere, contributing to climate change.

Negative emissions of
US Forests offset

15%

of US annual carbon emissions
from fossil fuels²



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NATURAL CLIMATE SOLUTIONS: FOREST-BASED STRATEGIES

Natural climate solutions are conservation, restoration, and management actions that increase carbon storage and avoid greenhouse emissions from forests, farms and wetlands.³

- **Reforestation** can have very large climate benefits over long time periods, but high costs and societal obstacles make creating new forests challenging, especially in densely populated areas. The lowest cost reforestation options in New York are on marginal and abandoned agricultural lands.
- **Avoided forest conversion** can be achieved with a variety of measures, including conservation easements, land trusts, and tax incentives. Small parcels of private forest land — which comprise 75% of New York State forest lands — should be prioritized as they are most vulnerable to conversion.
- **Natural forest management** options are relatively low cost and can be adapted to local conditions and landowner objectives. Many NY forest lands need active intervention to meet their potential as sustainable carbon sinks, due to insects, diseases, deer browsing and past land use. Managed forests provide carbon benefits along with wood products and other services to NYS residents, including air purification, water filtration, wildlife habitat, recreation, and personal health benefits.



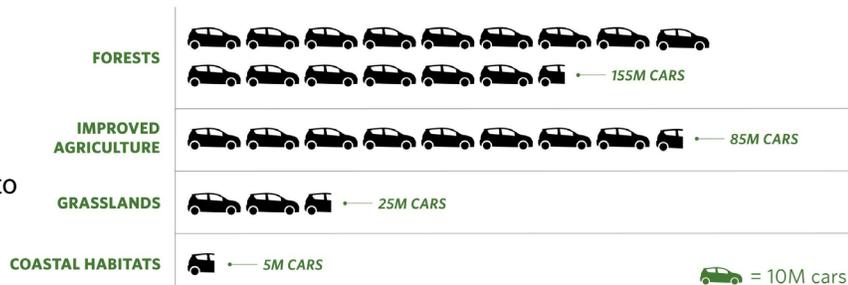
Reforestation
Establish more forested land through passive and active measures



Avoided Forest Conversion
Prevent conversion of existing forest lands to other land use types



Natural Forest Management
Enhance carbon benefits on working forest lands and help forests adapt to changing environment



U.S. Mitigation Potential: Approximate Number of Cars Removed Each Year in Millions

Forests in the US have the potential to remove more carbon from the atmosphere than all other natural climate solutions combined. Graphic courtesy of The Nature Conservancy.⁴

How much climate benefit is provided by NY forests?

CAFRI is mapping and monitoring forests, carbon, and land use change to support statewide greenhouse gas accounting, in partnership with NYSDEC and US Forest Service. Parcel-level maps and data on the past, current and potential future carbon benefits of forests can directly support public and private sector decision-making.

Contact CAFRI experts on the **natural climate solutions** provided by New York's forests:

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References:

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2. Woodall et al. 2015. The U.S. Forest Carbon Accounting Framework: Stocks and Stock Change, 1990-2016. US Forest Service Technical Report NRS-154.
3. Fargione et al. 2018. Science Advances 4: eaat1869.
4. The Nature Conservancy, www.naturalclimatesolutions.org, accessed 15 January 2020.