New York Forests Provide a Natural Solution to Climate Change

**KEY POINTS**

1. Practical solutions that reduce global CO\(_2\) levels are needed to address climate change.

2. Forests provide a natural climate solution by removing CO\(_2\) from the atmosphere and storing carbon for long periods of time — and these ‘negative emissions’ directly reduce climate risk.

3. Reforestation, avoided forest conversion, and natural forest management are proven strategies to reduce CO\(_2\) while providing many other ecosystem services.

4. Forest lands in New York State have a greater capacity to reduce CO\(_2\) 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 (CO\(_2\)) is the primary greenhouse gas responsible for climate change.
- Forests actively remove CO\(_2\) 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 CO\(_2\) 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.
- At larger scales, forest carbon benefits are 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 (e.g., housing, agriculture) will lose carbon stored in soils and have much less capacity for sequestration.
- In most cases, the conversion of forests to other land uses will create positive emissions of CO\(_2\) to the atmosphere, contributing to climate change.

---

Negative emissions of US forests offset 15% of US annual carbon emissions from fossil fuels\(^2\)
Natural climate solutions are conservation, restoration, and management actions that increase carbon storage and avoid greenhouse emissions from forests, farms and wetlands.\(^3\)

- **Reforestation** has very large climate benefits, but high costs and societal obstacles make creating new forests challenging, especially in densely populated areas. The lowest cost reforestation options in NYS 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 NYS 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 landowners’ objectives. Managed forests can provide carbon benefits along with wood products and other services to New York State, such as air and water filtration, wildlife habitat and recreation opportunities.

### What are the climate benefits of New York forests?

SUNY ESF is conducting a statewide assessment and developing a carbon accounting protocol in partnership with NYSDEC. This work will provide regulatory and policy guidance related to the emissions reductions and offsets mandated by the CLCPA legislation.

### Natural Forest Management

<table>
<thead>
<tr>
<th>U.S. Mitigation Potential: Approximate Number of Cars Removed Each Year in Millions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>FORESTS</strong></td>
</tr>
<tr>
<td><strong>IMPROVED AGRICULTURE</strong></td>
</tr>
<tr>
<td><strong>GRASSLANDS</strong></td>
</tr>
<tr>
<td><strong>COASTAL HABITATS</strong></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

For more information on natural climate solutions provided by NYS forests, contact:

- **Dr. Colin Beier, Associate Professor of Ecology**
  cbeier@esf.edu | (315) 470 6578
- **Dr. Robert Malmshheimer, Professor of Forest Policy and Law**
  rwmalmsh@esf.edu | (315) 470-6909

References:

---

**ABOUT THE CLIMATE & APPLIED FOREST RESEARCH INSTITUTE**

CAFRI is a multi-disciplinary team of forest, energy and climate experts based at SUNY ESF who provide policymakers and the public with science-based and practical solutions to address climate change.