

Gaining Carbon

*A report on reaching net-zero emissions by 2050
while protecting our precious forests, farmlands, and wetlands*

Massachusetts is a leader in addressing two global crises – climate change and loss of biodiversity. To meet the state’s goal to reach net-zero greenhouse gas emissions by 2050, a rapid and equitable transition to clean, renewable energy is crucial. The state’s own analyses estimate that Massachusetts will need to deploy **27 gigawatts (GW)** of solar photovoltaic (PV) systems **by 2050**. Currently, installed solar is nearly 4 GW.

Mass Audubon strongly supports rapid deployment of wind and solar – both are critical for decarbonizing electric power in time to meet our climate goals. However, to date over 10,000 acres of Massachusetts lands host ground-mounted solar PV systems, **roughly half of which were originally forests** cleared specifically for these systems.



An example of large ground-mounted solar in central Massachusetts. Here about 50 acres of forest have been lost, and this is just one of hundreds of such projects across the state. Image source via Google Maps

To avoid further compromising our long-term goals for natural carbon removal, biodiversity, and maintaining our resilience to climate change, we need a better approach to planning for and incentivizing these systems to minimize impacts on natural and working lands. **Our forests, farmlands, and wetlands provide essential ecosystem services:** sequestering and storing carbon, serving as native plant and animal habitat, local food production, clean air and water, outdoor recreation, and buffering against climate change impacts like flooding and drought. Careful site selection for renewable facilities of all types is critical to minimizing the loss and fragmentation of wildlife habitat and ecosystems.

In short, the pace of solar development needs to rapidly increase, with the deployment of ground-mount systems shifting toward already-developed lands rather than greenfields, prime farmland, and forests. Locating ground-mount systems as close to energy demand as is feasible will help reduce the costs of transmitting and distributing this clean energy .

The good news from *Gaining Carbon*? **We know it’s possible.**

The Report

In *Gaining Carbon*, Mass Audubon and Harvard Forest researchers identify pathways for solar development that fully meet our state's ambitious goals for clean energy for 2030, 2040, and 2050, while also minimizing losses of carbon, biodiversity, climate resiliency, and other values of our natural and working lands.

Gaining Carbon will demonstrate, using detailed geospatial and carbon mapping combined with best-in-class energy modeling by Evolved Energy Research, that **Massachusetts can reach our solar goals for 2030 and 2050, with more installations being located on buildings, parking lots, and already-developed lands rather than through converting forests, farms and other natural lands.**

In addition to creating detailed maps and results that show changes in energy costs, carbon, biodiversity, and climate resilience under different scenarios, our work will provide insights and recommendations for policy changes – for both the energy and land sectors – with broader climate planning.

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Gaining Carbon will be released in early Summer 2023.

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