



**COLGATE UNIVERSITY**

## **A University Creates Land Use Tools to Promote Conservation and Archive Carbon Neutrality**

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## **Academic Conservation Briefs**



An aerial view of Colgate University. Credit: Colgate University

### **At a glance:**

- 1,059-acre Colgate Forest
- Stewardship plan
- Forest climate action plan
- Carbon neutrality



***“Colgate Forest demonstrates how university properties can satisfy multiple functions at the same time, without forfeiting the overarching principle of sustainability.”***

**F**ounded in 1819, Colgate University is a private liberal arts university located in Hamilton, New York, with about 3,000 undergraduate students. Colgate University has expanded its land holdings over time through a number of land deeds and donations. It now holds a total of 1,675 acres across several parcels that include the 575-acre campus and 1,059 acres of forested land that is called the Colgate Forest.

The creation of the Colgate Forest, as well as two key land use management tools, has helped the university preserve its undeveloped land and to reach carbon neutrality. These outcomes fit well with Colgate University’s current strategic plan. The plan includes an important objective: to “contribute research, foster innovation, and model environmental sustainability to the community and beyond . . .” The plan goes on to read, “Colgate must continue to mitigate its impact on the climate and to strive to be a model of environmental responsibility.”<sup>1</sup>

### **Forest Conservation Tools**

Colgate University’s forested land was not acquired in one single transaction, but instead these parcels were donated in various transactions throughout the past 70 years. Now, the university’s entire acreage spans nine parcels, including a campus parcel, Hamilton Street (South and North), the Beattie Reserve, Bonney Hill, Parker Farm, Bewkes Center, Johnnycake Hill, Turkey Hill, and Upper Saranac Lake (Figure 1).

<sup>1</sup> Colgate University, “The Third Century Plan,” 2019.

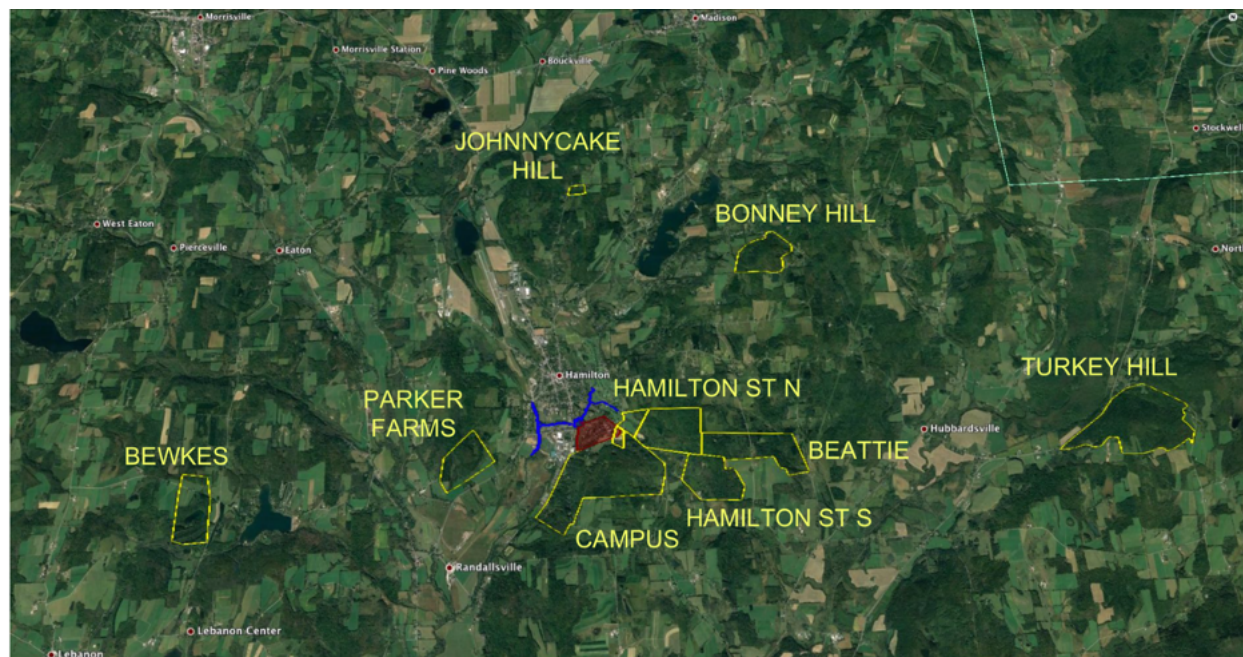


Figure 1. A map showing the parcels that together form Colgate Forest. Credit: John Pumilio

None of Colgate University's land is formally conserved with a conservation easement, but a stewardship plan is in place that encompasses the 1,059 acres owned by the university, known collectively as Colgate Forest. The plan is designed to be a tool for land use planning and careful decision making that promotes conservation, education, and compatible uses, such as low-impact recreation and sustainable harvesting.

In addition to the stewardship plan, Colgate University also initiated the Colgate Forest Climate Project as a carbon offset mechanism, and also a way to measure and recognize the health and sustainability of forest management within Colgate Forest. This approach has several purposes. Most importantly, by adding value to the university-owned forest land, it disincentivizes land conversion and creates an incentive for conservation. With these tools, Colgate University demonstrates how decision makers can meet multiple objectives without sacrificing sustainability.

## Forest Stewardship Plan

Colgate University manages its forest to meet two objectives, as outlined in the 2007 Colgate Forest Stewardship Plan:

- 1) ensure a sustainable flow of benefits to the university's community and
- 2) support the health and diversity of the flora and fauna that inhabit these lands and contiguous areas.<sup>2</sup>

In the process of satisfying these objectives, Colgate University seeks to follow the overriding priority of sustainable practice so that the lands may "retain their inherent function and capacity to produce benefits into the future." In short, Colgate University values the ecological importance of the land as much as its importance to the educational community.

Based on these objectives, the stewardship plan divided Colgate Forest into 65 management units and categorized them based on 4 classifications, which are listed here and then described in more detail, below.

- Preservation
- Research and teaching
- Recreation and aesthetics
- Timber management

In most cases, each land unit is capable of supporting two functions, and each unit is assigned primary and secondary classifications. In case of conflict, the primary classification overrides the secondary classification and dictates the main function of the management unit.

**Preservation:** This classification applies to land with distinct ecological characters or of cultural importance. In these areas, natural processes of the land are desired. When preservation is the primary classification, low-impact recreation and non-obtrusive teaching and research are all viable secondary classifications. However, timber management is not a compatible secondary classification.

<sup>2</sup> Steven Bick, "Colgate University Forest and Open Lands Stewardship Plan," Colgate University, 2007.



**Research and teaching:** This classification applies to land with established and on-going research and teaching activities. This is a secondary classification for all units, except for a few that are inaccessible. Students and faculty can apply for research projects on any unit or any portion of the land and the applications are reviewed based on specific cases. A few examples of research projects include the impacts of deer browsing on forest regeneration, acid rain and soil health, earthworm surveys, soundscape recordings, and bird banding and avian migration.

**Recreation and aesthetics:** This classification applies to land that is suitable for low-impact recreational activities or land that provides a scenic view. Sites with established recreational activities such as a trap range and snowmobile trail have this as their primary classification.

**Timber management:** This classification applies to land that has the potential for sustainable harvesting of wood for forest products or biomass energy feedstocks. Such sites are usually located away from campus in areas with traditional silvicultural practices. Because harvesting processes are usually temporary, recreation and research and teaching are all viable secondary classifications for land with timber management as their primary classification.

This approach to land classification and use demonstrates how university properties can satisfy multiple functions at the same time, without forfeiting the overarching principle of sustainability.



Colgate students hiking in the Colgate Forest. Credit: Colgate University

## Colgate Forest Climate Project

In addition to the four classifications of land use designated in the stewardship plan, carbon sequestration became another classification of Colgate Forest, added in 2013. As a part of the global effort in combating climate change, Colgate University published the Sustainability and Climate Action Plan, in which decision makers set a goal to reach carbon neutrality in 2019. Colgate University was successful in reaching this goal, and has become the first institution in New York State to do so. An important piece of reaching this goal was the carbon benefit of Colgate Forest.

Colgate University has reduced its carbon emissions by 40% through on-campus initiatives, an effort that began in 2009. However, it was clear from the beginning that for the university to reach carbon neutrality, it would require carbon offset projects. Therefore, Colgate invested in a number of off-campus and on-campus projects to offset carbon emissions. As a part of its Sustainability and Climate Action Plan, Colgate University recognized the ecological service of forests as important carbon sinks and established the Colgate Forest Carbon Project.

Under this plan, university decision makers began exploring the concept of including the university's forests as a part of its approach to climate neutrality and considered selling carbon offsets through a third-party organization. However, given that the Colgate Forest was only 1,000 acres—a relatively small amount for selling on the carbon market, which requires at least 5,000 acres—this was not an option for Colgate Forest. In addition, establishing a carbon sale requires a large initial cost and a commitment of no management or development of the forest land for 100 years. For these reasons combined, Colgate's Board of Trustees and administration chose not to sell carbon from its forests.

Instead of selling carbon offsets, Colgate University decided to undertake the Colgate Forest Carbon Project, which created a system of using the Colgate Forest to offset the university's own carbon emissions. The plan keeps track of the carbon stored in the Colgate Forest, and uses that amount to offset the overall carbon emissions from the university.

In 2013, the University conducted a carbon inventory on its forest. The purpose of the inventory was to “establish a baseline for forest carbon accounting and to determine the actual rates of forest carbon sequestration through the re-measurement of forest carbon in future

<sup>3</sup> Steven Bick, “Forest Carbon Inventory & Projections 2013,” Colgate University, 2013.



Taylor Lake. Credit: Colgate University

years.<sup>3</sup> Estimated annual forest sequestration showcases the contribution of Colgate Forest towards the overall carbon neutrality of the College.

The total acreage included in the carbon inventory included all 9 parcels and encompassed 1,059 acres (Figure 2). Using the U.S. Forest Service's carbon sequestration measurement guidelines,<sup>4</sup> Colgate University selected 174 sample plots, each one-tenth of an acre in size, to estimate the carbon stored in Colgate Forest. Then, carbon sequestration was re-measured after five years to evaluate the change in carbon over that time period. Recently, stored tree carbon was re-

calculated to measure annual carbon sequestration, and the result indicated that annual carbon sequestration was equivalent to 3,776 tons of carbon dioxide, or is about 4% of Colgate University's total carbon footprint of 15,216 MTeCO<sub>2</sub> annually.

The Colgate Forest Climate Project allowed Colgate University to achieve carbon neutrality, while also establishing a carbon baseline that serves as an incentive to avoid land development and land conversion. This is important, because, currently, none of the land discussed in the stewardship plan is under permanent conservation easements. Together, the Colgate Forest Climate Project and the Colgate Forest Stewardship Plan are meaningful tools to plan for and incentivize the conservation of the university's land and the natural processes occurring on it, while also allowing for compatible uses. The success of these tools was underscored when, in 2014, the American Tree Farm System certified Colgate Forest "for long-term sustainable management, with the goal to maintain the forest so that it can exist indefinitely."<sup>5</sup>

PARCEL	FOREST ACREAGE
Campus	337.7
Hamilton Street (north & south)	199.8
Beattie Reserve	130.8
Bonney Hill	61.3
Parker Farm	73.1
Bewkes Center	116.2
Johnnycake Hill	12.0
Turkey Hill	116.4
Upper Saranac	11.4
<b>Total Forest Acreage</b>	<b>1,058.7</b>

**Figure 2.** A table showing forest acreage included in the carbon inventory of 2013. Source: Colgate University.

<sup>4</sup> Timothy R. H. Pearson, Sandra L. Brown, and Richard A. Birdsey, "Measurement Guidelines for the Sequestration of Forest Carbon," USDA Forest Service, 2007.

<sup>5</sup> K. Hayes, "Managing University's Forests is Another Key Piece of Carbon Neutrality Goal," Colgate University News (blog), December 2, 2014.



## Lessons Learned

The Colgate Forest, and its stewardship plan and carbon project, highlights the significant role university forests can have in conserving forest land and combatting climate change. By establishing a forest carbon offset project, Colgate University brought light to the tremendous ecological service provided by their forests and elevated their importance in the campus-wide climate plan. For other institutions looking to do the same, there are several key takeaways from the management strategies of Colgate Forest. One element of this work that can potentially transfer to other institutions is using an approach to land conservation other than an easement. According to Director Pumilio, Colgate University might consider placing properties under conservation easements in the future. However, placing land under conservation easements is a difficult decision for the university to make since it would exclude the land from alternative uses in perpetuity. Instead, the university created a stewardship plan that designated land units and allowable uses, and that creates a system for compatibility among the different uses. This is an important decision-making tool for any university forest.

Another takeaway is the use of carbon inventorying to add value to the university's forest land. Establishing a carbon baseline, and monitoring carbon storage as a means to offset the university's emissions so that they may reach their goal of carbon neutrality, all serves to add weight when making land-use decisions. As Director Pumilio explains, this skews decision making towards responsible uses, such as timber management activities and silviculture that have minimal impact on carbon storage, and away from drastic changes in the landscape, such as converting forests into buildings, that would reduce carbon storage in the forest drastically.

Overall, the planning of Colgate Forest demonstrates that a forest carbon project is compatible with a wide range of land management activities. It also shows that land management strategies used by institutions can play a paramount role in addressing land conservation and climate change.

## References

Bick, Steven. "Colgate University Forest and Open Lands Stewardship Plan." Colgate University, 2007.

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Pearson, Timothy R.H., Sandra L. Brown, and Richard A. Birdsey. "Measurement Guidelines for the Sequestration of Forest Carbon, General Technical Report NRS-18." USDA Forest Service, Northern Research Station, 2007. <https://www.nrs.fs.fed.us/pubs/3292>

## More Information

Colgate University: Land and Forest Stewardship: <https://www.colgate.edu/about/sustainability/land-forest-stewardship>

Colgate University: Action Plan for a Sustainable Campus: <https://www.colgate.edu/about/third-century-plan/bicentennial-plan-sustainable-and-carbon-neutral-campus>



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