Campus Forests in Mitigating Climate Change & Meeting Carbon Goals

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Emergence: 2009-2015 Overview

January 2009: American College & University Presidents' Climate Commitment signed.

Fall 2009: Colgate's first comprehensive carbon inventory is completed. Total emissions = 17,353 tons.

July 2011: Sign 15-year agreement with Patagonia Sur to purchase 5,000 tons of carbon offsets per year.

Fall 2011: 2011-2015 Sustainability & Climate Action Plan approved after an 18-month effort led by members of the Sustainability Council.

- Input from seven subcommittees (30+ faculty/staff); students in CORE 128 (2009), F-SEM 124 (2010), ENST 480 (2009 and 2010), and ENST 390 (2011), engineering firms, and student interns.
- 27 projects
- Est. 2019 carbon neutrality date

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Projects Implemented:
(GHG Reductions)

- Forest Sequestration (~1,500 tons)
- Heating Plant Upgrade (~1,200 tons)
- Green Living (~300 tons)
- Green Office (~200 tons)
- Low-flow Showerheads (~150 tons)
- Geothermal Energy (~50 tons)
- Lighting Upgrades (~40 tons)
- Fume Hood Monitoring: (~35 tons)
- Onsite Pre-consumer Composting (~20 tons)
- Reforestation of 2 acres (~20 tons)
- No Idling Policy (~10 tons)
- Green Bike Program (~10 tons)
- Washer & Dryer Upgrades (~10 tons)
- Solar Thermal Energy 100 Broad St (~9 tons)
- Reduced Mowing on 30 acres (~6 tons)
- Electric & Hybrid Vehicles (~5 tons)
- Improved Recycling (~5 tons)
- Trayless Dining in Frank Dining Hall (~5 tons)
- Recycled Paper Purchasing (~3 tons)

Total GHG Reductions = 3,500 tons

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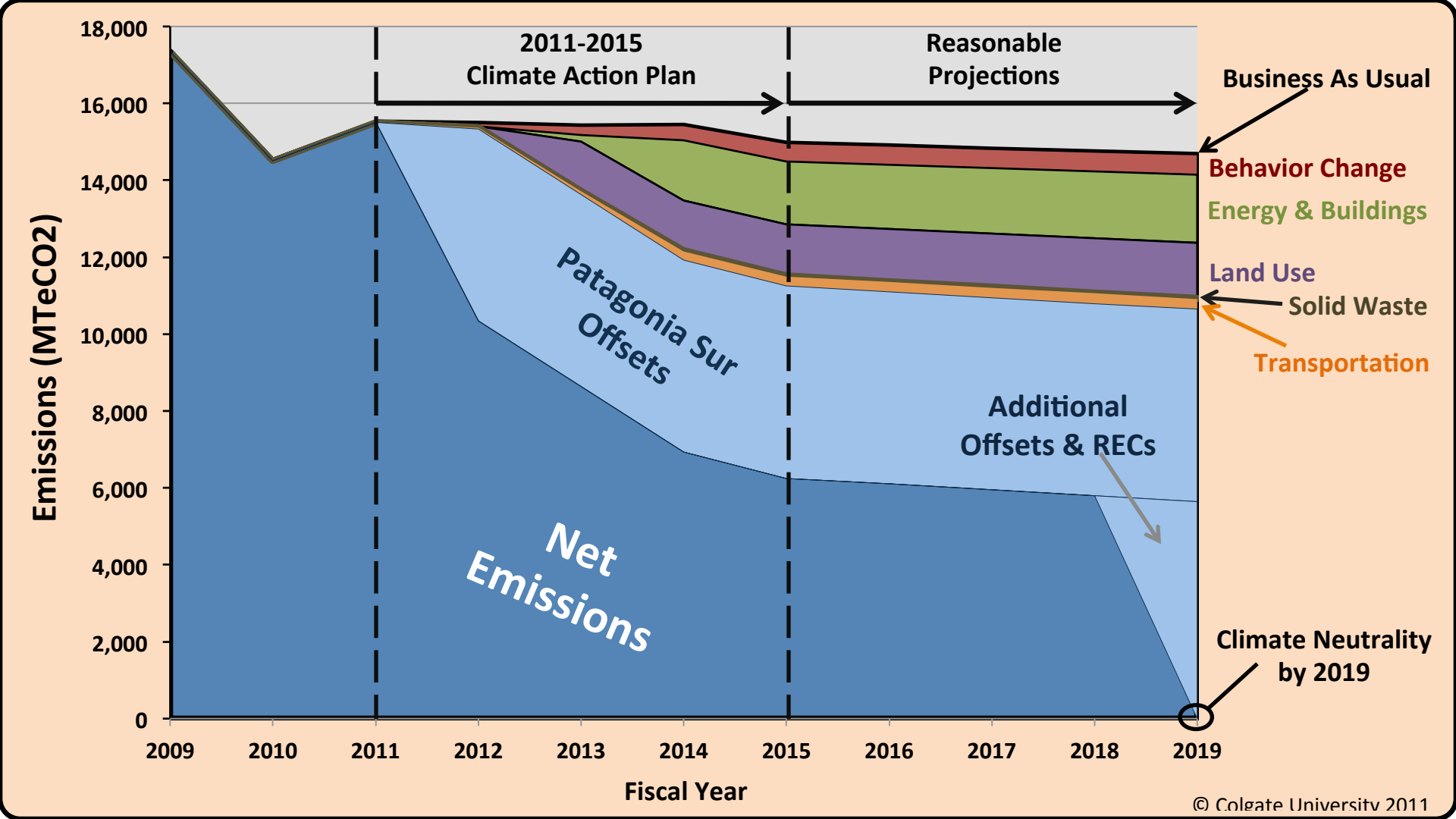

Forestry Based Climate Solutions

at Colgate University

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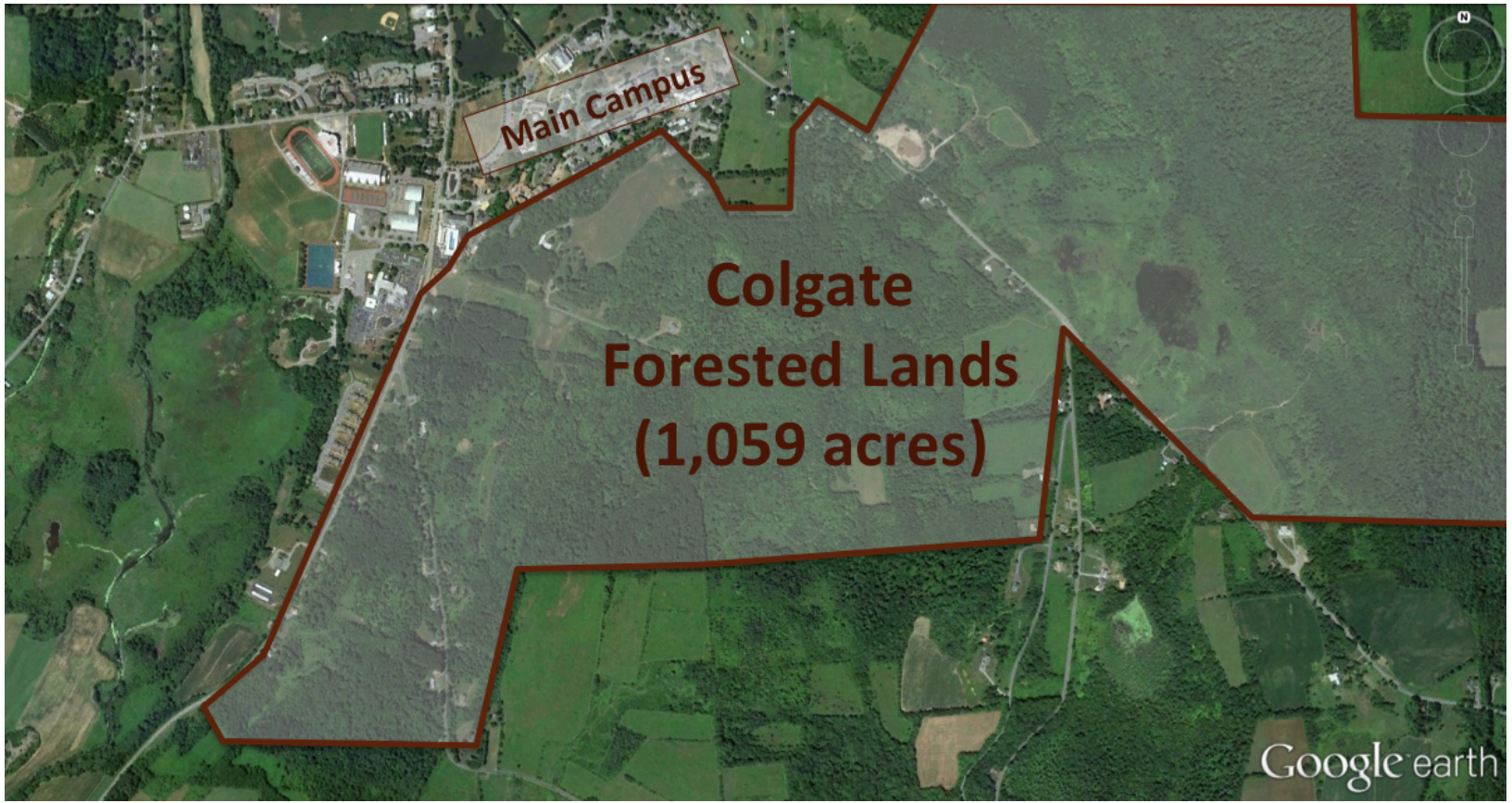
Two Programs:

1. Patagonia Sur Carbon Offset Program
2. ***Colgate Forest Sequestration Project***

“Should we count Colgate’s forest as a carbon sink?”



“Should we count Colgate’s forest as a carbon sink?”

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Why count forest carbon?

- Provides new teaching and research opportunities
- Elevates the important role of forest carbon in overcoming climate change
- Adds value and recognition to campus forests
- Provides incentive to reduce land conversion

Colgate's recommended approach to forest carbon accounting:

Condition #1:

Create a forest stewardship committee and long-term management plan

Four forest management objectives:

1. Teaching & research opportunities

2. Outdoor recreation & aesthetic value

3. Conservation of ecosystem services & biodiversity

4. Timber production

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Colgate's recommended approach to forest carbon accounting:

Condition #2:

Seek third-party certification for long-term sustainable management practices

In November 2013, Colgate's 1,059 acres of forested lands received certification from the American Tree Farm System for long-term sustainable management.

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Colgate's recommended approach to forest carbon accounting:

Condition #3:

Include carbon emissions from timber harvests

We track carbon emissions from harvested wood based on final product.

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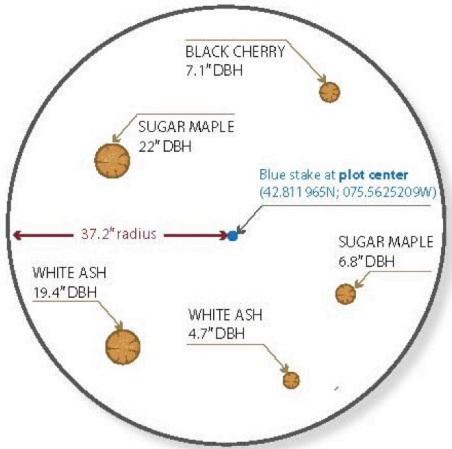
Creating a Baseline Forest Carbon Inventory

Step #1:

Field Measurements

- 174 sample plots (1/10 acre each)
- Measure woody stems 3” DBH and larger

FIGURE 2. DIAGRAM OF A 1/10 ACRE FOREST TREE CARBON SAMPLING PLOT



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Creating a Baseline Forest Carbon Inventory

Step #2:

Include carbon emissions from timber harvests

- Calculate above and below ground biomass
- Total tree biomass is converted to metric tons of CO2 (using a factor of 0.5)
- Sampling plots are extrapolated to estimate total tree carbon for each management unit

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Creating a Baseline Forest Carbon Inventory

Step #3:

Results

Colgate's forests contain **165,491 tons** of stored carbon while sequestering an additional **1,578 tons** of carbon.

This mitigates about 10 percent of our campus carbon emissions.

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Creating a Baseline Forest Carbon Inventory

Step #4:

Re-inventory

Every five years (beginning in 2018), Colgate will re-measure all trees to determine the total amount of stored carbon.

The annual rate of sequestration will equal the (2018 total) - (2013 total) divided by 5 years.

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Reforestation & Forest Stewardship as Climate Solutions

For more information and full reports visit:

colgate.edu/green

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