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CATHOLIC SCHOOL

HOW MUCH CARBON IS STORED IN THE TREES ON OUR CAMPUS?

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Introduction

We are **Henry, Anna, Juanita** and **Audrey**. We are in 7th grade at **Saint Rose School** in **Perrysburg, Ohio.**

It is important to study how much carbon is stored in trees because it could help with greenhouse gases and climate change.

Research Question

How much carbon is stored in the trees on our campus?

We studied the carbon cycle and learned about the importance of trees as carbon sinks to remove carbon dioxide from the atmosphere. Understanding the importance of trees in storing carbon will help us to be good stewards of our environment.

GLOBE Visualization System

Measurements | Data Counts

Select Language | Sign In

2025-03-27

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Research Methods

On March 27, 2025, we used the GLOBE Observer app to make tree observations on campus and we sent them to GLOBE.

Sites on Map: 15995

Legends

Research Methods

We measured the circumference of hardwood, deciduous trees and pine trees. And we counted the number of each type of tree.

We used a spreadsheet and graph to find the biomass and carbon content for an average hardwood and average pine tree. We multiplied these values to find the total carbon stored in the trees on campus.

Research Methods

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Circumference of St Rose Trees

	A	B	C	D	E
1	Circumference inches		**Circumference cm**		DBH cm
2	54		**137.2**		43.7
3	30		**76.2**		24.3
4	42		**106.7**		34.0
5	33		**83.8**		26.7
6	30.75		**78.1**		24.9
7	99.75		**253.4**		80.7
8	33		**83.8**		26.7
9	65		**165.1**		52.6
10	58.5		**148.6**		47.3
11	52		**132.1**		42.1
12	13		**33.0**		10.5
13	24		**61.0**		19.4
14	46		**116.8**		37.2
15	37		**94.0**		29.9
16	84		**213.4**		67.9
17	63		**160.0**		51.0
18	50		**127.0**		40.4
19	58		**147.3**		46.9
20	59		**149.9**		47.7
21	57.5		**146.1**		46.5
22	53.5		**135.9**		43.3
23	100		**254.0**		80.9
24	12.5		**31.8**		10.1
25	24		**61.0**		19.4
26	65		**165.1**		52.6
27	47		**119.4**		38.0
28	16		**40.6**		12.9
29	67		**170.2**		54.2
30	72		**182.9**		58.2
31	42		**106.7**		34.0
32	65		**165.1**		52.6
33	42		**106.7**		34.0
34	12		**30.5**		9.7
35	8		**20.3**		6.5
36					
37				Average DBH	38.4

Deciduous Hardwood Trees | Tree count | 7B Tree Count | Pine Trees Soft Wood | Total carbon

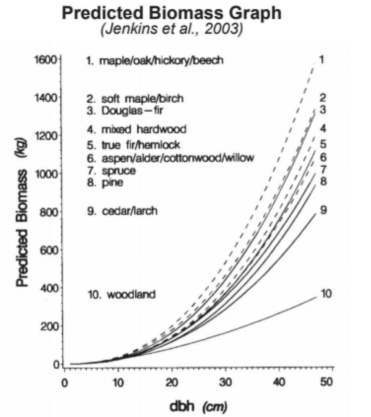

Figure 1. Graphs of ten equations for predicting total aboveground biomass by species group. Hardwoods are represented by dashed lines, softwoods by solid lines.

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Results: DBH

The average diameter at breast height (DBH) for the hardwood, deciduous trees was 38.4 cm

The average DBH for pine trees was 22.2 cm

.1		52.6
.4		38.0
.6		12.9
.2		54.2
.9		58.2
.7		34.0
.1		52.6
.7		34.0
.5		9.7
.3		
	Average DBH	38.4

AM Fri Apr 25

Circumference of St Rose Trees

A	B	C	D	E
Circumference inches		**Circumference cm**		DBH cm
47		**119.4**		38.0
30		**76.2**		24.3
18		**45.7**		14.6
84		**213.4**		67.9
38		**96.5**		30.7
15		**38.1**		12.1
24		**61.0**		19.4
28		**71.1**		22.6
8		**20.3**		6.5
33		**83.8**		26.7
7		**17.8**		5.7
10		**25.4**		8.1
15		**38.1**		12.1
	Average			**22.2**

DBH

Results: Biomass

The average biomass for hardwood, deciduous trees was approximately 1000 kg

The average biomass for pine trees was approximately 200 kg.

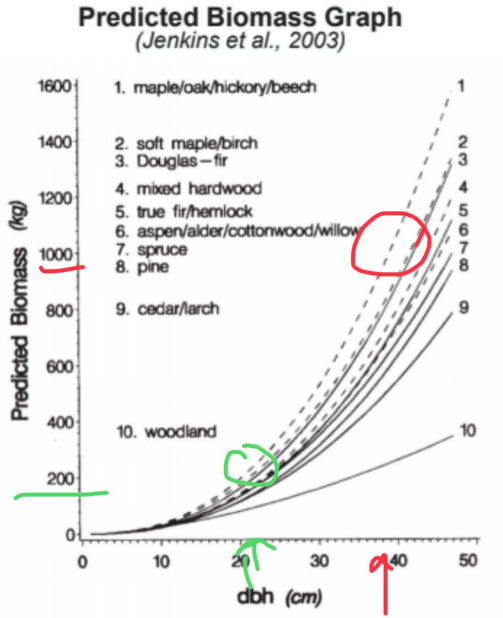

Figure 1. Graphs of ten equations for predicting total aboveground biomass by species group. Hardwoods are represented by dashed lines, softwoods by solid lines.

Results: Carbon Content

We counted 92 hardwood deciduous trees and 63 pine trees.

The model assumes 50% of the trees' biomass is carbon.

The trees on our campus store approximately 52,300 kg of carbon

	A	B
1	Deciduous	Pine
2	80	63
3	90	64
4	107	67
5	93	70
6	93	68
7	93	58
8	93	58
9	79	61
10	67	61
11	150	52
12	90	75
13	109	60
14	93	48
15	**95**	**62**
16	88	64
17	***92***	***63***

	A	B	C	D	E	F
1	Tree type	Biomass Kg	Carbon kg	Tree count	Total carbon kg	
2	Deciduous	1000	500	92	46000	
3	Pine	200	100	63	6300	
4						
5				Total	**52300**	**Kg**

Discussion

- The trees on our campus store over 50 tonnes of carbon, which helps to offset our carbon footprints.

- We learned that trees are an important part of the carbon cycle because they remove carbon from the atmosphere and store it like a sink.

- We evaluated our carbon footprints to understand how our lifestyle affects the carbon cycle. We also researched ways to reduce our carbon footprint and how to offset our carbon footprint by planting trees.

Limitations

We had some technical difficulties with using the GLOBE OBSERVER app to make tree observations. The app froze up in the middle of taking observations for about half of the students making observations.

Next Steps

In the future, we could investigate the carbon stored in other vegetation, such as shrubs and grasses.

In the future, we could learn to identify the trees more accurately than just as hardwood deciduous or pine trees.

References

“Biometry (Including Tree Height) - Biosphere - GLOBE.gov.” Globe.gov, 2025, www.globe.gov/web/biosphere/protocols/biometry-including-tree-height-.

“Carbon Cycle - Biosphere - GLOBE.gov.” Globe.gov, 2025, www.globe.gov/web/biosphere/protocols/carbon-cycle.

Jenkins, Jennifer C.; Chojnacky, David C.; Heath, Linda S.; Birdsey, Richard A. 2003. National scale biomass estimators for United States tree species. Forest Science. 49: 12-35

Sara Mierzwiak, University of Toledo, GLOBE MISSION EARTH, visited and encouraged the students throughout the year.

How Much Carbon is Stored in the Trees on Campus?
Saint Rose Catholic School, Perrysburg, Ohio

We learned trees are an important part of the carbon cycle because they remove carbon from the atmosphere and store it like a sink. The trees on our campus store over 50 tonnes of carbon, which helps to offset our carbon footprints.