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Colorado Forest Service measures forest carbon emissions

Rebekah Barry, Staff Reporter

March 27, 2025



Collegian | Trin Bonner

A recent study published by the Colorado State Forest Service took a deeper look into the impact of Colorado's trees and how they store carbon. The findings reported that some of Colorado's forests release more carbon than they draw due to dying trees that are actively decomposing.

Trees naturally store carbon in their bark, but the amount and the impact vary, especially when the trees decompose or are impacted by diseases or insects.

"In recent decades, those forests are where you are seeing that more carbon is being released than it's being added," said Tony Vorster, a research scientist and study lead at Colorado State University. "And what happens in those places is that as the trees decompose and break down, that carbon that's stored in the wood of the tree, it's broken down. So it goes in soil, but a lot of it goes into the atmosphere."

The study's geographical area is wide. Even with this information, it should be kept in mind that this data applies to recent years, and results fluctuate and can be nuanced.

"(The) bigger picture of this report found that Colorado's forests hold a lot of carbon, and that continues to this day, and it's just in recent years that it's releasing slightly more carbon than it adds," Vorster said. "But when you just put it in perspective, if you were to compare the amount of carbon that it holds compared to what it releases, it's like 0.06%, so a very tiny fraction of it at least every year. ... It's pretty close to a balance."

The data used in this study was collected between 2002 to 2019.

"(We're) using a dataset called the Forest Inventory and Analysis program," Vorster said. "(It) is a set of locations across the U.S. where the Forest Service goes out and remeasures those locations in the forest — in Colorado, it's every 10 years. ... So all in all, we use over 250,000 tree measurements — single tree measurements."

"It's interesting to know that when you look out in the forest, half of that weight of the trees that you're seeing out there is carbon. You see a beautiful view. You also see a huge carbon reservoir that sucks carbon out of the atmosphere and holds it." -Tony Vorster, Colorado State University research scientist

The results show that a variety of specific trees hold more carbon than others. Some trees act as **carbon sinks**, meaning they hold more carbon than they actually release into the atmosphere.

"(It's) one kind of snapshot in time where we can use the best available information that's available to us to say that, right now, we know from the last 20 years we're a carbon source," said Ashley Prentice, a forest carbon specialist and co-author of the study. "But if we compared it to 10, 100, 200, even 500 years ago, we could have a very different outcome. So the context and kind of the magnitude that we look at these things (with) is really important."

Specific species of trees that hold more carbon than others include spruce and fir. Some forests as a whole may also absorb more carbon than others, which can also be attributed to the individual species of trees found in specific areas of land.

"(In) terms of carbon emissions and our carbon flux or our carbon sequestration, those same forest types of spruce, fir, aspen, pinyon, juniper and lodgepole pine were the ... largest sources of carbon, but the ponderosa pine and woodland hardwoods forest types were actual carbon approximate estimated to be carbon sinks, though very weak carbon sinks, so they're sequestering more than they are releasing," Prentice said.

While this study focuses on Colorado's forests, there are many other studies being conducted about the impact carbon has on forests in America. The research ranges from state and national parks to public and private areas, hosting a wide range of data to be analyzed.

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"It's a very active area of research," Prentice said. "There's a lot of geospatial analyses that can be done to tie geospatial products to field-based data. I would just say it's a very exciting realm of research as we're all kind of, you know, trying to figure out what's the best course of action and what we should be doing, what areas should we be prioritizing (and) what types of management treatment should we be doing."

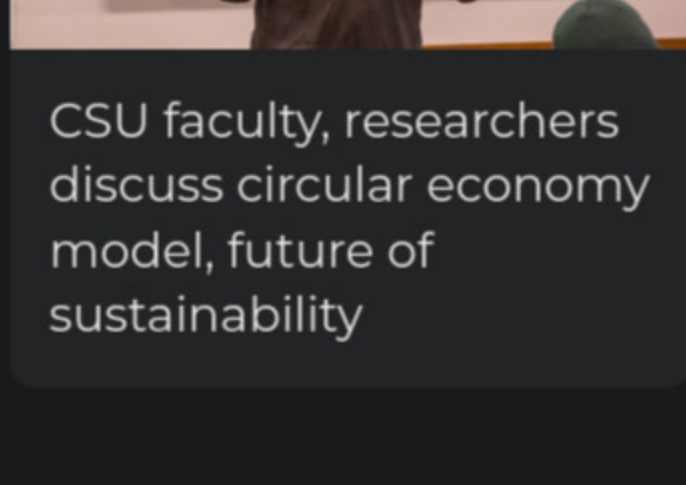
Even for those who do not have a background in research or forestry, there is a different perspective to consider.

"It's interesting to know that when you look out in the forest, half of that weight of the trees that you're seeing out there is carbon," Vorster said. "You see a beautiful view. You also see a huge carbon reservoir that sucks carbon out of the atmosphere and holds it. ... While these forests hold lots of carbon, they also cycle through times when they're adding carbon, when they're releasing carbon."

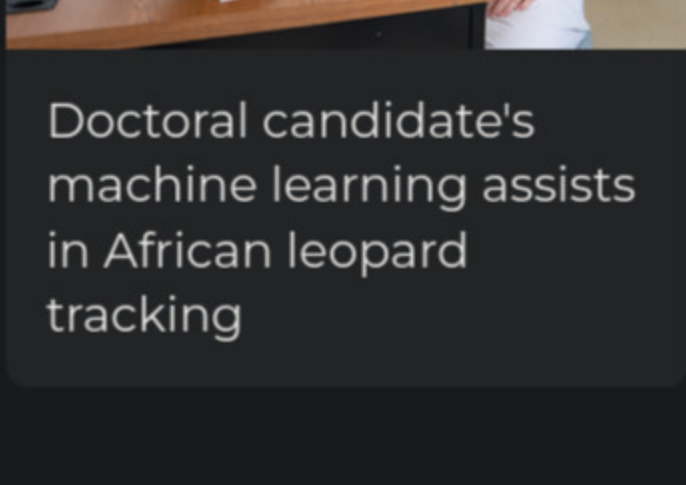
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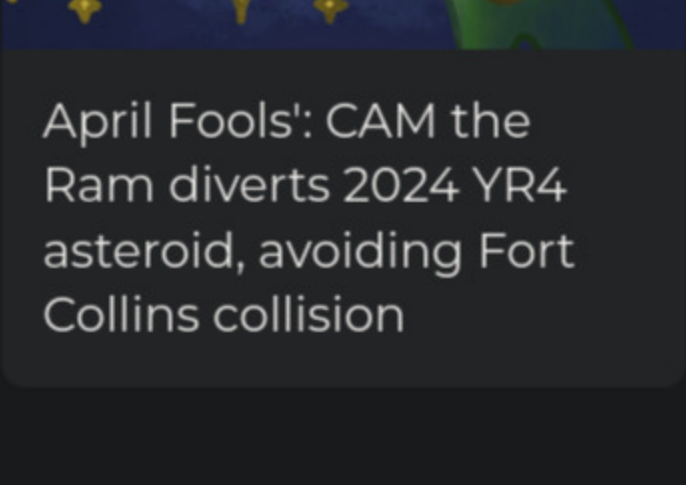
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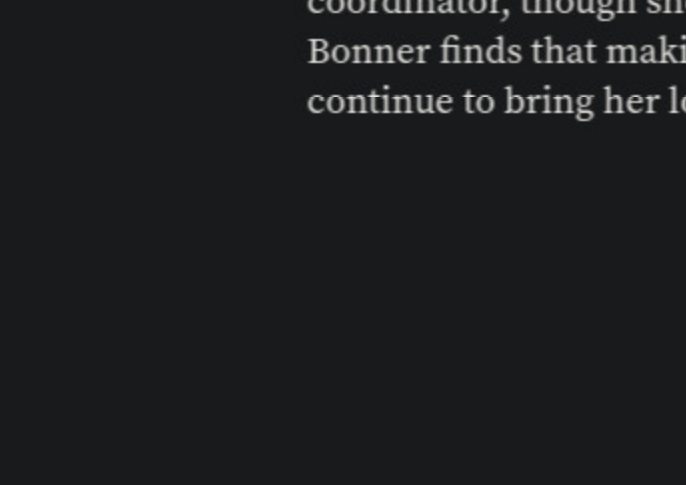


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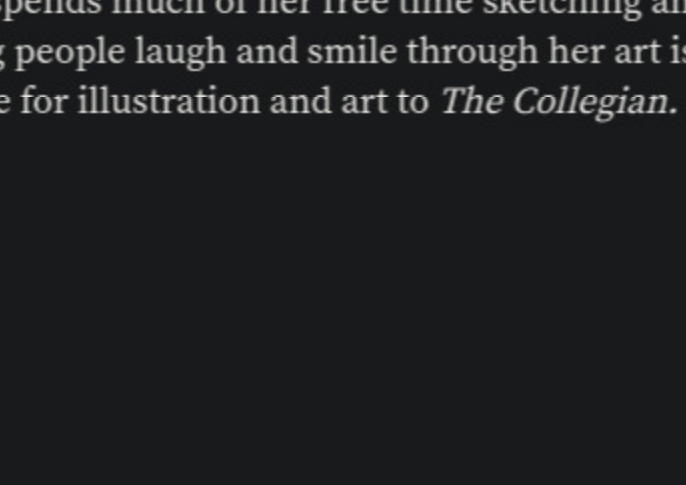


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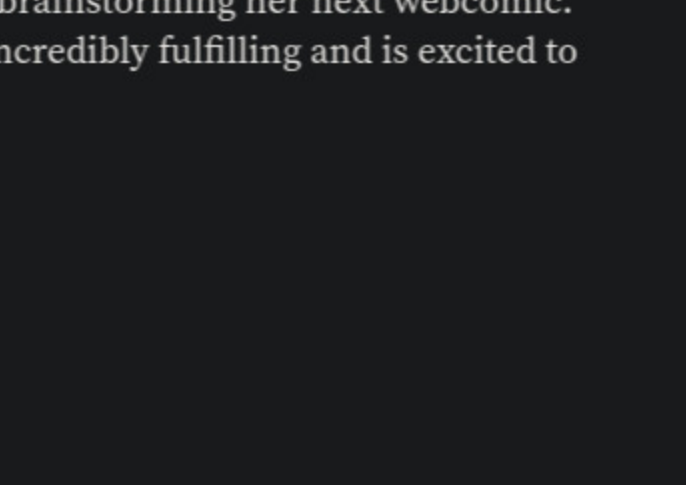
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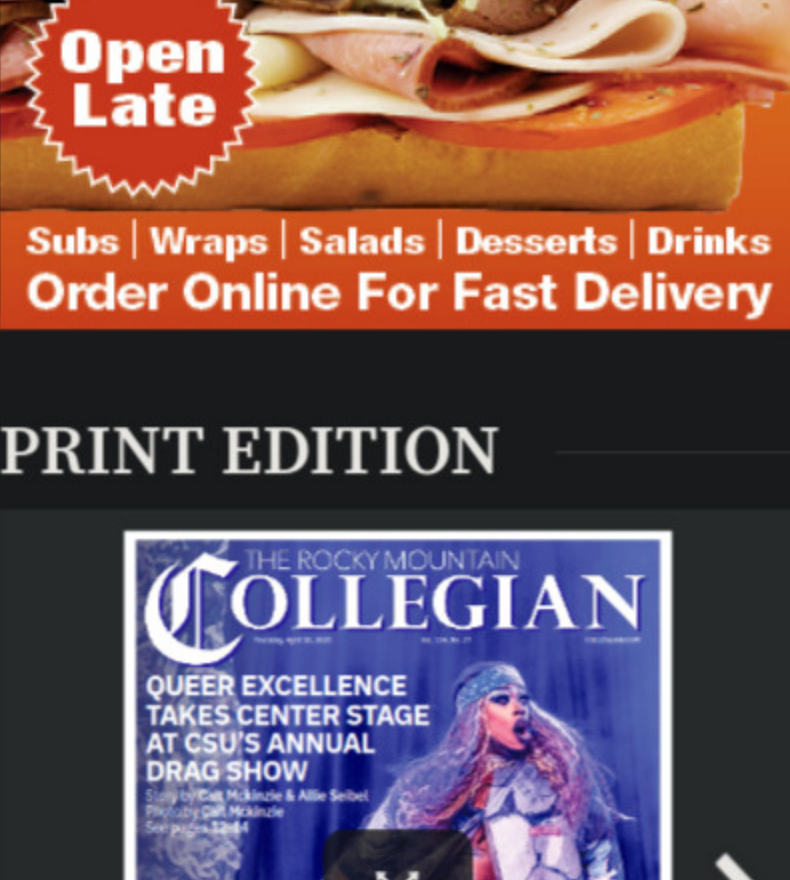


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About the Contributor



Trin Bonner, Illustration Director & Assistant Print Editor
Trin Bonner is the illustration editor for *The Collegian* newspaper. This will be her fourth year in the position, and she loves being a part of the creative and amazing design team of *The Collegian*. As the illustration editor, Bonner provides creative insight and ideas that bring the newspaper the best graphics and illustrations possible. She loves working with artists to develop fun and unique weekly illustrations for readers. She enjoys helping the illustrators on her desk explore and expand their artistic abilities as well as challenge their skills with every edition. Bonner is a senior studying graphic design and electronic art and is also a community coordinator for Aggie Village Apartments on Colorado State University's campus. She finds immense joy in illustration and comic creation. She hopes to explore more in the realm of graphic design and video game design as she approaches the end of her undergraduate experience. Trin spends her free time crocheting, doing beadwork and playing guitar when she's not working on illustrations or acting as community coordinator, though she spends much of her free time sketching and brainstorming her next webcomic. Bonner finds that making people laugh and smile through her art is incredibly fulfilling and is excited to continue to bring her love for illustration and art to *The Collegian*.



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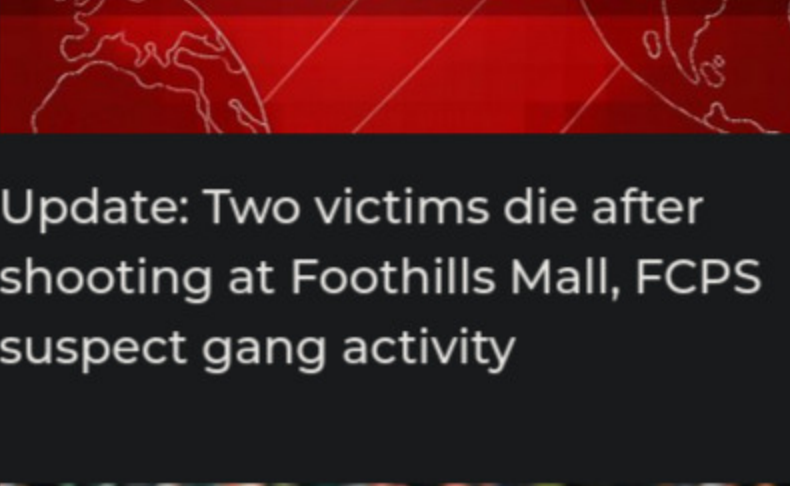


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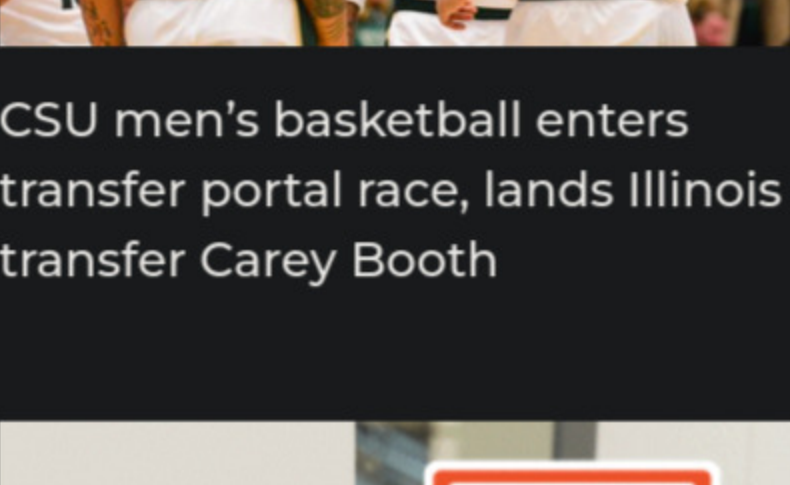


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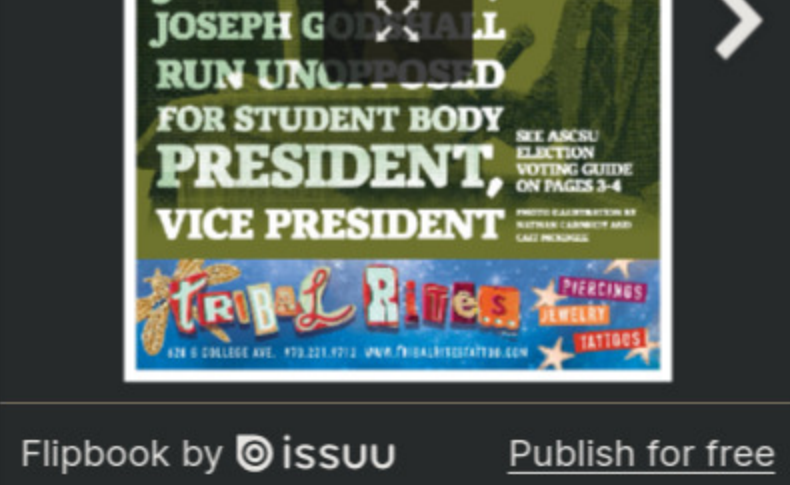
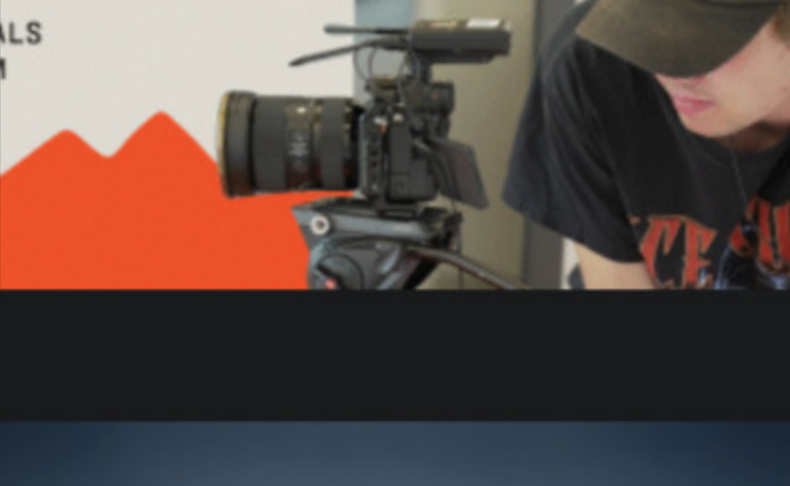
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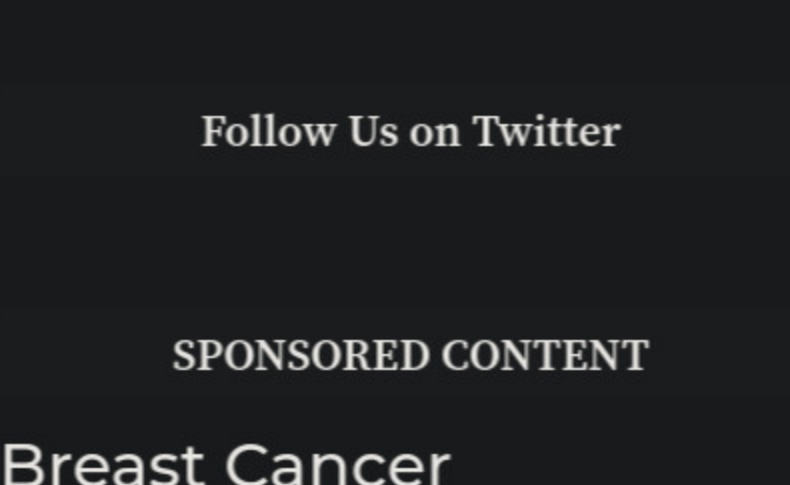
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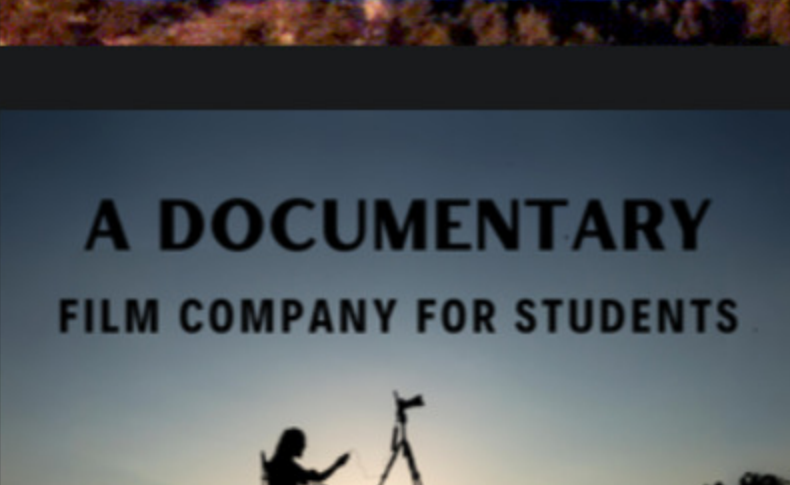
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