Wetland experts explain role of vital carbon sinks carbon cycle in new report

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Evan Kane is an associate professor in Michigan Tech's School of Forest Resources and Environmental Science. Credit: Michigan Tech

The Second State of the Carbon Cycle Report (SOCCR2), released simultaneously with the fourth U.S. National Climate Assessment

(NCA4), puts needed numbers to the rates of carbon loss and accumulation in North American terrestrial, aquatic and atmospheric systems.

According to the report, 11 to 13 percent of global ecosystem carbon removal can be attributed to North American ecosystems. Land use changes to these ecosystems can release more carbon into the atmosphere. For this reason, wetlands and their huge carbon sequestering power play a crucial role in preventing atmospheric carbon levels from rising.

Evan Kane, associate professor, and Rodney Chimner, professor, in Michigan Tech's School of Forest Resources and Environmental Science, are contributing authors to Chapter 13 of the report, which focuses on terrestrial wetlands.

Globally, wetlands represent just three percent of total land area, but sequester 30 percent of all soil carbon. North American wetlands comprise 37 percent of all wetland area globally, so their value to carbon accounting cannot be overstated. North American terrestrial wetlands currently are a carbon dioxide sink of about 123 teragrams of carbon per year, with approximately 53 percent occurring in forested wetland systems.

"This demonstrates how important wetlands are to the North American carbon cycle, because despite the fact that a small percentage of the landscape is wetlands, they store a huge percentage of the soil carbon," Chimner said.

Rodney Chimner is a professor in Michigan Tech's School of Forest Resources and Environmental Science. Credit: Michigan Tech

Maintaining existing wetlands, restoring damaged wetlands, and replacing wetlands removed for development are necessary to ensure soil carbon remains in soil, and is not released into the atmosphere. Though the number of wetlands restored or created anew is increasing in North America, these ecosystems remain threatened by changing precipitation patterns and wildfire.

"It's no surprise that changing hydrology changes the abilities of wetlands to hold carbon," Kane said. "It's no surprise that wetlands that are dry are different—they're more susceptible to vegetation changes—and when dry, they are more susceptible to burning. It's a feedback loop."

More information: N. Cavallaro et al, Second State of the Carbon Cycle Report, (2018). DOI: 10.7930/SOCCR2.2018

The Second State of the Carbon Cycle Report (SOCCR2) is available via carbon2018.globalchange.gov

The 4th U.S. National Climate Assessment was also released simultaneously via nca2018.globalchange.gov

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