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Editorial

Mangrove Forests: Storage Houses of Carbon

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EDITORIAL

Mangroves are one of the world's most carbon-dense ecosystems. At regional, national, and global dimensions, the potential of mangroves to store and accumulate carbon has been measured and reported. Coastal mangrove forests are carbon storage powerhouses, storing massive amounts of organic matter in their tangled root webs beneath the surface. Even for mangroves, little pockets of forest growing around sinkholes on Mexico's Yucatan Peninsula contain an "amazing" amount of carbon. These woods have the ability to store more than five times the amount of carbon per hectare as most other terrestrial forests.

On the peninsula, there are dozens of mangrove-lined sinkholes. Carbon storage hotspots like these could help countries or businesses achieve carbon neutrality, where the amount of greenhouse gas emissions discharged into the atmosphere is balanced by the quantity of carbon trapped away. Researchers gathered soil samples from three cenotes at depths of up to 6 meters and used carbon-14 dating to determine how quickly the soil had accumulated at each location. The three cenotes had "huge" levels of soil organic carbon, averaging roughly 1,500 metric tons per hectare, according to the researchers. Casa Cenote, for example, stores up to 2,792 metric tons per hectare.

Mangrove roots are excellent organic material trappers. Submerged soils can aid in carbon conservation. Mangroves have maintained pace with rising sea levels for the previous 8,000 years, growing atop material carried in from rivers or moving inland. There are no rivers to feed sediment in the Yucatan Peninsula's cave-infested limestone landscape. Instead, “the mangroves create more roots to avoid drowning,” which aids tree growth and provides more area for organic materials to collect.

Sea levels may someday rise too swiftly for mangroves to keep up as global temperatures rise. Groundwater pollution, growing infrastructure, urbanization, and tourism are among the more immediate dangers to the peninsula's carbon-rich cenotes. Cenotes are important wetlands that provide habitat for migrating birds as well as a variety of endemic amphibians and freshwater fish, many of which are endangered. Despite their value, cenotes are under threat from a variety of sources, including groundwater extraction to sustain a fast-expanding tourism sector and pollution from agricultural and domestic activities.

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