SMART and NTU Singapore: Pioneering Peatland Rest

Alita Sharon March 15, 2024

Recognising the urgent need for effective restoration measures, researchers at the Singapore-MIT Alliance for Research and Technology (SMART Nanyang Technological University, Singapore (NTU Singapore) have pioneered a groundbreaking method that leverages satellite data and advanc mathematical modelling to accurately measure the carbon stored in bogs, thereby facilitating peatland restoration efforts and aiding in the fight ag change.

Often referred to as bogs, Peatlands are among the Earth's most valu ecosystems, serving as natural carbon storehouses crucial for regula climate. However, human activities such as drainage and deforestati severely impacted these fragile environments, leading to the release amounts of carbon dioxide and making them susceptible to devastat

Peatlands are renowned for their unparalleled capacity to sequester raised peatlands in particular acting as reservoirs for vast amounts o accumulated over thousands of years. However, the variable shape varying depths of their carbon-rich soil, known as peat, present sign challenges in accurately assessing their carbon storage potential.

Previous methods for measuring carbon stocks in peatlands often re intensive onsite sampling, which was impractical for the vast and in

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expanses of many tropical peatlands. This innovative approach redu
for onsite sampling and provides valuable insights into the morphol
allowing for more accurate assessments of their carbon storage capacity and water flow patterns.

The development of this new method represents a significant breakthrough in peatland research and conservation, offering a powerful tool for po
conservationists, and land managers to better understand and protect these critical ecosystems. By accurately quantifying the carbon stored in pea
governments can make informed decisions about land-use planning and prioritise conservation efforts to mitigate carbon emissions and prevent w

Moreover, the insights gained from this research have far-reaching implications for global climate change mitigation strategies. Peatlands cover o
three per cent of the Earth's land surface but store more carbon per area than any other terrestrial ecosystem.

Therefore, protecting and restoring peatlands through methods such as rewetting, which involves blocking drainage channels to maintain wet con
highly effective nature-based solution for reducing greenhouse gas emissions and preserving biodiversity.

Dr Alex Cobb, Senior Principal Research Scientist at SMART and the Lead Author of the Study emphasised the significance of the team's findin
"Peatlands have acted as huge stores of carbon since before the time of the dinosaurs. In fact, modern coal deposits started as peatlands. The findi
possible to describe and compare the shape of bogs anywhere, enabling us to protect and restore these vital ecosystems effectively."

Dr René Dommain, Senior Research Fellow at NTU's Earth Observatory of Singapore and co-author of the study underscored the practical appli
research, stating, "We can accurately measure the amount of carbon stored in peatlands and identify areas at risk of fire or degradation due to hun
This work lays the foundation for successful peatland restoration efforts and contributes to global climate change mitigation."

Published in the prestigious scientific journal Nature, this groundbreaking research represents a significant step forward in the understanding of p
their role in global carbon cycling.

Moving forward, the researchers plan to expand their analyses to remote peatland regions of the tropics and develop tools to estimate carbon stoc
precision, further advancing the ability to protect and restore these invaluable ecosystems for generations to come.