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Down-to-earth fix for the carbon crisis

02 December 2006

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THERE might just be a dirt cheap solution to global warming - dirt itself. Contrary to expectations, the amount of carbon locked away in the world's soils appears to have been increasing for at least 6000 years. If a way could be found to squirrel away even more carbon, it might solve the problem of what to do with the carbon released into the atmosphere as greenhouse gases.

Soil is the second-largest reservoir of carbon compounds on the planet, exceeded only by the oceans. However, the dynamics of how carbon enters and leaves the soil, and how long it stays there once it's locked up by growing plants and microbes, has been difficult to study. Most of the little research so far has focused on the short-term carbon cycling going on in forests or farmland over a period of years or decades.

Now a new study by Rienk Smittenberg of the Royal Netherlands Institute for Sea Research and his colleagues has examined the stability of carbon in soils over millennia.

The team looked at the build-up of soil washed into the sea by rivers in the Canadian Arctic. In the anoxic waters of a fjord called Saanich Inlet, the sediments form distinctive layered beds, with a layer of dark soil laid down in the fall and winter, followed by a whitish layer deposited each spring and summer because of calcifying algae that add carbonates and silicates to the mix, Smittenberg says.

That makes annual layers as easy to count as tree rings, Smittenberg told *New Scientist*, and bits of wood incorporated in the layers can be carbon-dated to verify the layers' ages. Land soil is almost impossible to date this way because it is moved and reprocessed by living organisms, which do not survive in the oxygen-deprived inlet sediments.

The layers revealed that carbon has been building up in the soil over the past 6000 years. While most climate models assume the carbon remains in equilibrium, constantly absorbed from the air by growing plants and then given off again as the plants decompose, the new work suggests these models might need adjusting.

It also suggests that changing agricultural practices to increase the rate at which the soil absorbs carbon could help offset what is released into the atmosphere from burning fossil fuels, an idea proposed by physicist Freeman Dyson of the Institute for Advanced Study in Princeton, New Jersey. The process would take a long time to spread enough to make a difference, Smittenberg admits. "It's definitely not a silver bullet," he says, "but it's definitely worth doing."

From issue 2580 of New Scientist magazine, 02 December 2006, page 13

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