Northern peatlands a misunderstood player in climate change

March 15 2011

University of Alberta researchers have determined that the influence of northern peatlands on the prehistorical record of climate change has been over estimated, but the vast northern wetlands must still be watched closely as the planet grapples with its current global warming trend.

Northern peatlands, which are a boggy mixture of dead organic material and water, cover more than four million square kilometers. The largest northern peatlands occur in the subarctic regions of Canada and Russia. As peatlands grow they sequester carbon (in the form of carbon dioxide from the atmosphere. However, as old peat is buried and begins to decompose it emits large amounts of methane, a potent greenhouse gas.

Alberto Reyes and Colin Cooke were PhD students in the U of A's Department of Earth and Atmospheric Sciences when they began their research into the response of northern peatlands to climate change.

They began their research by studying radiocarbon dates of ancient peatlands to examine how peatlands first colonized northern regions at the end of the last ice age, a period of rapid global warming. Using this technique, they compared the expansion of northern peatlands to ice-core records of past climate, including carbon dioxide and methane.

Atmospheric carbon dioxide and methane rose dramatically 10,000 years ago at the end of the last ice age. In the past, scientists had suggested that northern peatlands were a large, if not the principle, source of the dramatic increase in atmospheric methane.

But the U of A team revealed that the peatlands did not colonize the north until 500-1000 years after the abrupt increases in atmospheric methane. These results show that other methane sources, such as tropical wetlands, were the likely drivers of the initial rises in methane levels at the end of the last ice age.

The research by Reyes and Cooke points to the miscalculation of the role of northern peatlands and wetlands in the methane rise 10,000 years ago as an example of how complex and easily these huge areas of the planet can be misunderstood. The researchers say future work will focus on the northern peatlands as nature's own carbon-capture mechanism and on their flipside role an emitter of carbon in the form of methane.

The research was published online last month in *Proceedings of the National Academy of Sciences.*

Provided by University of Alberta