

ATS/CIRA Colloquium

Kevin Schaefer

National Snow & Ice Data Center, NOAA/CIRES

**The impact of the permafrost carbon feedback
on global climate**

Hosted by Scott Denning

Friday, November 6, 2015

**ATS room 101; Discussion will begin at 11:15am
Refreshments will be served at 10:45am in the weather lab**

Permafrost is permanently frozen ground covering 24% of the northern hemisphere land surface and contains 1100 Gt of carbon in the form of frozen organic matter. Temperatures in the high northern latitudes are increasing twice as fast as the global average. As temperatures continue to increase and the permafrost begins to thaw, the organic matter will also thaw. Once thawed, the organic matter will decay, releasing carbon dioxide (CO₂) and methane (CH₄) into the atmosphere. The permafrost carbon feedback (PCF) is the amplification of surface warming due to CO₂ and CH₄ emissions from thawing permafrost. Here we will provide basic background on permafrost dynamics in the northern hemisphere, show where the frozen carbon is located, and explain how it got there. We will summarize the latest research on when the permafrost will begin to thaw, how much carbon could be released and when, and the impact of the PCF on global temperature. We conclude with a discussion of the economic impacts of permafrost emissions and the political implications relative to the negotiation of the Global climate Change Treaty.

Link to colloquium videos and announcement page: <http://www.atmos.colostate.edu/dept/colloquia.php>