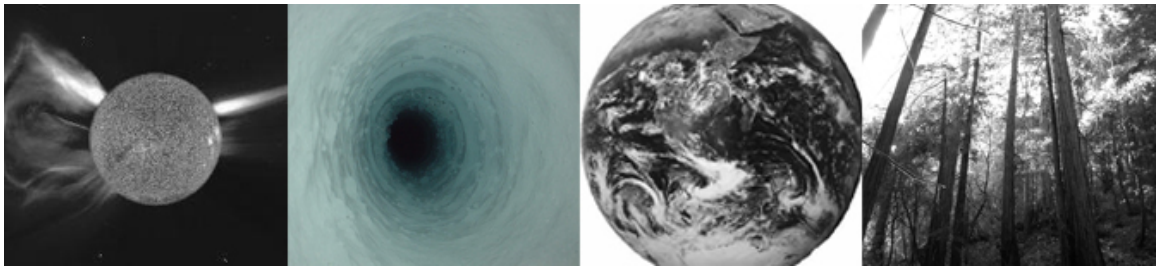
Environmental Sciences And CREATE Seminar Series



The strength, timing, and consequences of the permafrost carbon-cycle feedback to climate change

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Permafrost soils contain an estimated 1700 Pg of carbon, almost twice the current atmospheric carbon pool. As permafrost soils thaw due to climate warming, decay of organic matter within these soils will transfer carbon to the atmosphere, leading to a positive feedback to climate warming. This presentation summarizes model-based research to quantify to magnitude and wider consequences of this feedback to climate change. According to the simulations, permafrost soils will release between 68 and 508 Pg carbon by 2100. The model results suggest that the additional surface warming generated by the feedback between permafrost carbon and climate is independent of the pathway of human emissions followed in the twenty-first century. In addition, it is estimated that this feedback could result in an additional warming of 0.13 to 1.69°C by 2300. The addition of this previously neglected positive carbon cycle feedback to climate change leads to a simulated continued increase in atmospheric CO_2 concentration after total cessation of human CO_2 emissions. These model results suggest that, although slow, the permafrost carbon cycle feedback will have significant and long lasting effect on the magnitude of human induced climate change.

All are welcome.
Wednesday, **September 4th,** 2013
2:15 – 3:05PM
Physical Sciences Centre 2045

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