With its vast stores of ancient organic matter, the fate of permafrost in the Arctic is a critical but underappreciated element in the future trajectory of Earth’s climate system. This presentation will explore the potential magnitude of carbon loss from thawing permafrost, and consider the possible impacts of wildfire on the fate of carbon in the Arctic. The role of changing river discharge and chemistry on the terrestrial carbon balance of the Arctic will also be addressed. The presentation will be pan-arctic in scale, reflecting the fact that the vast majority of the Arctic landmass is outside of the United States. It will also feature discussion of the Polaris Project (thepolarisproject.org), which for the past eight years has engaged undergraduate students and others in global change research in the Siberian and Alaskan Arctic.