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Towards a mechanistic understanding of current and future carbon dynamics in arctic tundra ecosystems

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As a result of disruptions to the global carbon cycle we are experiencing climatic warming. It is predicted that the effects of climate change will be greatest and fastest at high latitudes. Land-climate interactions in the Arctic could be critical in determining the extent of global climate change through biogeochemical and biophysical feedbacks. The aim of our study was to quantify differences in carbon uptake, respiration and allocation among key arctic vegetation types and their responses to drivers such as snow cover, soil temperature and moisture. We used an *in-situ* automated chamber system to measure carbon and water fluxes of the four dominant vegetation types at a tundra site in Abisko, northern Sweden. Hourly measurements of net ecosystem exchange were taken from snow melt in April through to soil freeze in October. Using a mechanistic modeling approach we identify the key ecological processes which determine the carbon dynamics of different vegetation types. We can use this understanding to better simulate current and future land-climate interactions in arctic ecosystems.