

A new model intercomparison at SPRUCE

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Quantifying the impacts of climate change on and potential feedbacks from carbon-rich peatland systems is critically important to Earth system predictions. To improve understanding of peatland processes, a whole-ecosystem warming experiment began at the Spruce and Peatlands Responses Under Climatic and Environmental Change (SPRUCE) site in northern Minnesota in 2015, and addition of atmospheric carbon dioxide is beginning in 2016. Initial *a priori* simulations from a small number of models indicated widely varying carbon dioxide and methane flux responses to warming and CO₂ addition depending on the model assumptions. A more formal model intercomparison is now underway to evaluate model predictions of pre-treatment conditions and to form hypotheses about decadal-scale effects of the manipulations. Participating modelers are providing detailed information about model structure and parameters that will help us better understand the sources of prediction uncertainty. Historical meteorological and environmental pre-treatment driver datasets have been provided and initial simulations using these forcings are shown. Plot-level driver datasets with specific temperature and CO₂ manipulations, including chamber effects (e.g. on snowfall, and solar radiation), are being constructed to represent several possible future scenarios over the course of the experiment. These scenarios will be used to assess the impact of interannual variations in climate superimposed on the treatments, for example consecutive drought or wet years. Models will also be provided with century-scale climate change scenarios to predict the peatland responses over long timescales.