

Improvement of forest carbon balance model DALEC2 for flux site Alice Holt using four-dimensional variational data assimilation.

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1 Introduction

Four-dimensional variational data assimilation (4D-Var) has been used extensively in numerical weather prediction to improve forecasts REF. Currently efforts to use variational assimilation with carbon balance models have been limited REF, with sequential and Markov Chain Monte Carlo methods being more prevalent REF. In this report we will parameterize a model of forest carbon balance (DALEC2) using a 4D-Var scheme in order to produce better forecasts of forest carbon balance. We will use data from the research site at Alice Holt forest run by Forest Research.

2 Methods

Forecast skill score, $SS = 1 - \frac{MSE_{forecast}}{MSE_{ref}}$, http://en.wikipedia.org/wiki/Forecast_skill