Simulating Vegetation Responses and Carbon Fluxes to Climate Change using MC1 Model

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The objective of this study was to apply MC1 model to assess the climate change effects on vegetation distribution and ecosystem carbon fluxes. Because of complexity of the global system and the impossibility of controlled experiments, it needs to improve qualitative, computer-based modeling. Even though there is no specific dynamic vegetation model, which is optimized on Korean ecosystem, the application of MC1 model can provide the assessment of vegetation responses and carbon fluxes in Korea. As results of simulations, the current potential vegetation was occupied with coniferous forest, while the area of southern and eastern Korea was invaded by mixed forest in simulations using climatic data from ECHO-G A1B future scenario. However, because the result of MC1 simulation failed to notice some land use effects, some forests could be distributed over human development districts, where vegetations are unfavorable situations. Moreover, MC1 model was designed to assess the impacts of climate changes on the US ecosystem, not on Korea ecosystem. Therefore, it is necessary to develop the Korea-specific dynamic vegetation model for further research.

Key words: MC1, Climate Change, Vegetation Distribution, Carbon Flux