

Development of VISIT: a terrestrial biogeochemical model including trace gas exchange and lateral transfer process

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An integrated model of terrestrial biogeochemistry model (VISIT: Vegetation Integrative Simulator for Trace gases) was developed to simulate carbon and nitrogen cycles and matter exchange through the atmosphere and water. The model was modified from a simple carbon cycle model, Sim-CYCLE, so that nutrient limitation and human impacts are practically included. By introducing methane and nitrous oxide sub-models, the model estimates net greenhouse gas exchange weighted by the global warming potential. At several Japanese forests, the model simulated net greenhouse gas exchange successfully. Also, the model accounts for emissions from biomass burning such as carbon monoxide and black carbon, and emissions of volatile organic carbon such as isoprene. For underground dynamics, the model includes an empirical sub-model of water erosion, leaching of nitrate, and discharge of dissolved organic carbon, making the model a useful tool for biogeochemical studies. The model structure and preliminary results will be presented.