

Global-scale swamp forest modelling using satellite-based elevation and forest datasets

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Swamp forest (seasonally flooded forest) has different characteristics to usual non-flooded forest in terms of carbon pool and nutrient flux. Swamp forest exists in wide climate regions from boreal to tropical regions, but its global distribution is not well studied because satellite observation of inundated forest floor is disturbed by vegetation canopy. Here, we propose a method to estimate the global distribution of swamp forest by global river model simulations using satellite elevation and forest datasets. Digital Elevation Models (DEMs) based on satellite radar or stereoscopy have elevation biases due to forest canopy that impede the simulation of swamp forest hydrodynamics. We removed the elevation biases by combining ICESat forest height data and Landsat forest density data. The simulation with the bias-corrected DEM shows good agreement to L-band radar observation of swamp forest inundation in the Amazon basin, which suggests the potential of the proposed method for estimating swamp forest distribution.

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