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*Modelling the dynamics of diatoms on New Brunswick's mudflats*

At low tide in the upper Bay of Fundy, over a kilometre of intertidal mudflats are exposed. The microalgal biofilms that grow on these mudflats are a carbon sink, but their potential for carbon sequestration is still being understood. One hurdle is that the primary component of the microalgal biofilm, diatoms, migrate vertically within the mud. Diatoms rise to the surface when the sun comes out, but recede when the light becomes too intense and when the tide comes in. Therefore, surface measurements of diatom populations made by remote sensing technologies, such as drones and satellites, need to be corrected. To that end, we propose a one-dimensional advection-diffusion-reaction equation to describe how the diatom population changes with depth and time. The model is implemented in Julia, and some sensitivity analyses are presented to show how the surface behaviour is influenced by parameters such as temperature and light intensity.