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The formation of drumlins

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It is proposed that the formation of the
subglacial bedforms known as drumlins occurs
through an instability associated with the flow of ice over a wet
deformable till. We pose a mathematical model which describes this
instability, and we solve a simplified version of
the model numerically in order to establish
the form of finite amplitude two-dimensional
waveforms. A feature of the solutions is
that cavities frequently form downstream of the bedforms, and we
allow the model to cater for this possibility, and we provide an
efficient numerical method to solve the resulting free boundary
problem.