



## **Investigation of wind-driven polynya dynamics with a mass and momentum conserving, one-dimensional model**

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The dynamics of polynyas have been often investigated with relatively simple flux models that use the ice continuity, or mass balance, equation to calculate polynya evolution. In these models, steady wind and surface heat flux forcing lead to polynyas opening to a steady-state width in timescales of hours to a few days. Here we discuss the strengths and weaknesses of the flux model approach and, in particular, examine critically the concept of a steady-state polynya.