



## **Slushy layers**

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Flooding and snow-ice formation in the Antarctic sea-ice pack are important processes in controlling the mass balance of both the ice and its snow cover and affecting the thermal and radiometric properties of the snow. This process occurs when the snow overlying sea ice is inundated with seawater or brine, forming a slushy layer. This binary mixture of ice and brine is akin to the so-called mushy layer found at the bottom of freezing sea ice but has several distinct characteristics that control its thermophysical evolution. We present a two-dimensional model of an evolving slushy layer, extended to include brine wicking and two-phase flow. The role of the permeability of the underlying ice in controlling the properties of the slushy layer is explored with simple heuristic models. The role of slushy layers in the thermodynamic evolution of the ice and snow is discussed. Simple parameterizations for use in one-dimensional models are presented.