

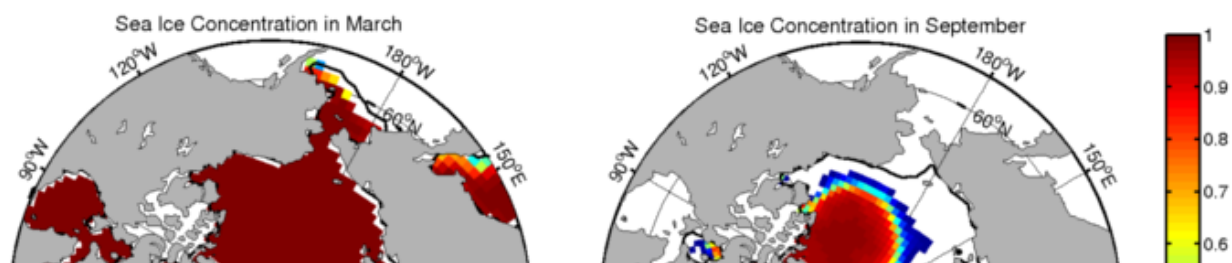


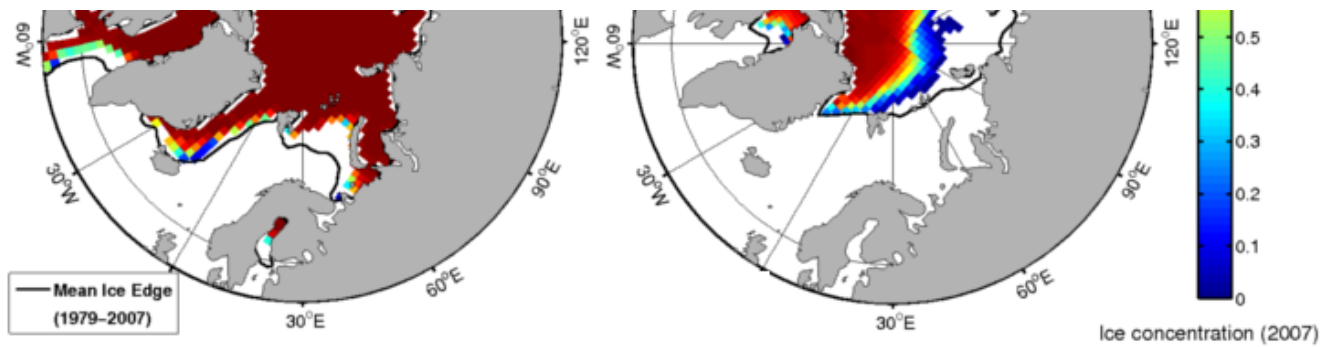
## [Louvain-la-Neuve Sea Ice Model \(LIM\)](#)

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## LIM3

LIM3 is the most recent version of LIM. It is a five-category sea ice thickness, enthalpy, salinity and age distribution model. The vertical ice growth and decay in each thickness category is determined by an energy conserving thermodynamic model with one layer of snow and five layers of ice. The effect of brine pockets on the ice thermal properties is explicitly accounted for. The surface albedo depends on the state of the surface, the snow and ice thicknesses, and the cloudiness. The model also includes a snow ice formation scheme. A linear remapping procedure is utilized to compute the transport in thickness space. For each thickness category, the bulk salinity of sea ice is calculated by taking into consideration brine entrapment during freezing and the most important brine drainage mechanisms, i.e., gravity drainage and flushing. The vertical sea ice salinity profile is parameterized as a function of this bulk salinity and the ice thickness. A parameterization of frazil ice production in open water areas is also incorporated. Ice dynamics are simulated by assuming that sea ice behaves as a two-dimensional elastic-viscous-plastic continuum in dynamical interaction with atmosphere and ocean. The ice momentum and transport equations are written in curvilinear, orthogonal coordinates and are numerically solved on a C-grid. For the transport equation, a numerical method that conserves the second-order moments of the spatial distribution of the advected quantity is used. Regarding the ice mechanical redistribution functions, they take into account both ridging and rafting processes as well as the influence of the ridge porosity. Finally, it is worth mentioning that the age of each ice thickness category is explicitly modeled. The code can be downloaded from the [NEMO website](#) .





Please quote the following reference in all scientific publications using LIM3 :

Vancoppenolle, M., T. Fichefet, H. Goosse, S. Bouillon, G. Madec, and M.A. Morales Maqueda, 2009 : Simulating the mass balance and salinity of Arctic and Antarctic sea ice. 1. Model description and validation. *Ocean Modelling*, 27, 33-53, [doi : 10.1016/j.oceamod.2008.10.005](https://doi.org/10.1016/j.oceamod.2008.10.005).

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