A modelling tool to assess dispersal abilities of Antarctica species

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During environmental changes in Antarctic ecosystems, biota faces three possible outcomes: adaptation, migration or extinction. Successful migration depends on dispersal behaviour which allows individuals to move from natal to reproductive sites or between different reproductive sites. Dispersal is thus an essential key in the ability of Antarctic biota to find refugia and therefore to survive environmental changes. Knowledge of this kind of past and current survival strategies is crucial to predict biota responses to future climate changes (Fraser et al. 2012).

To this end, the regional hydrodynamic model COHERENS (Luyten 2011) is currently implemented with an horizontal resolution of 10 km over a part of Antarctica which covers the Weddell and Scotia seas and surroundings of the Antarctic Peninsula. COHERENS will be coupled to the Louvain-la-neuve ice model (LIM; Vancoppenolle et al. 2009). The Lagrangian particle module of COHERENS will be adapted and used to study the dispersion of several Antarctica species such as the bivalve *Lanternula elliptica* and the fish *Notothenia. rossii* during their egg and/or larval stages. This modelling tool will help understand how dispersal of selected species is influenced by ocean circulation, biological traits and habitat preferences. The tool will also allow to assess the connectivity of populations in the considered geographic area and to estimate the influence of dispersal on species survival during changing environmental conditions (*i.e.* warming of the ocean, increase in fresh water flux)

References
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