

The effect of habitat shape on biological invasions

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Biological invasions depend on the shape of the region of invasion. Narrow passages like an isthmus or through a straight (for fish populations) can greatly affect the possibility and characteristics of population movement. In this talk, I will discuss a general reaction-diffusion model addressing such questions. I will describe various geometric conditions on the shape that lead to either blocking of the invasion, or partial, or complete invasion. Such questions arise in a number of models in biology. I will also present a related question arising in a model for the effect of climate change on biological populations. It would be of interest to see if these notions are relevant for other frameworks in crowd dynamics.