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Martha J. Garlick* (marti.garlick@aggiemail.usu.edu), **James A. Powell**, **Mevin B. Hooten** and **Leslie R. McFarlane**. *Homogenization of Large-Scale Movement Models in Ecology*.

A difficulty in using diffusion models to predict large scale animal population dispersal is that individuals move differently based on local information (as opposed to gradients) in differing habitat types. This can be accommodated by using ecological diffusion. However, real environments are often spatially complex, limiting application of a direct approach. Homogenization for partial differential equations has long been applied to Fickian diffusion (in which average individual movement is organized along gradients of habitat and population density). We derive a homogenization procedure for ecological diffusion and apply it to a simple model for chronic wasting disease in mule deer. Homogenization allows us to determine the impact of small scale (10-100 m) habitat variability on large scale (10-100 km) movement. The procedure generates asymptotic equations for solutions on the large scale with parameters defined by small-scale variation. The simplicity of this homogenization procedure is striking when compared to the multi-dimensional homogenization procedure for Fickian diffusion, and the method will be equally straightforward for more complex models. (Received September 15, 2011)