1086-92-1979 **M. J. Garlick***, martha.garlick@sdsmt.edu, and **J. A. Powell**, **M. B. Hooten** and **L. R. McFarlane**. *A spatial model for chronic wasting disease in mule deer.*

Chronic wasting disease (CWD) is an infectious prion disease, which is rare in the free-ranging deer population of Utah. We present a sex-structured, spatial model for the spread of CWD over heterogeneous landscapes, incorporating both horizontal and environmental transmission pathways. To connect the local movement of deer to the regional spread of CWD, we use ecological diffusion with motility coefficients estimated from mule deer movement data. Female and male deer are modeled separately to reflect behavioral differences that are thought to affect disease transmission. A homogenization technique is applied to greatly reduce the computational load for a simulation of disease spread across a portion of Southeast Utah. The homogenized model provides accuracy while maintaining fidelity to small-scale habitat effects on deer distribution, including differential aggregation in land cover types with high residence times. We use the averaged coefficients from the homogenized model to explore asymptotic invasion speed and critical population size for portions of our study area. We find that incorporating deer movement through heterogeneous environments with disease spread is critical in predicting how CWD spreads from one area to another. (Received September 24, 2012)