1116-VC-2972 **Shane Lubold*** (shane@lubold.com). *Application of Wasserstein distance to biological systems.*

In many biological systems, we observe the emergence of complex spatial organizations (such as flocks of birds, swarms of bees). Our goal is to understand and classify those patterns according to an adapted metric. In this talk we discuss the Wasserstein distance (WD) and its application to biological systems. The WD measures the distance between probability density functions. In one dimension, the WD is the area between the quantile functions of two density functions. In two dimensions the same approach is not feasible. In this talk we provide numerical results for one-dimensional Gaussian functions and Dirac Delta distributions, for two-dimensional density functions, and for the expected error in computing the WD between normally distributed Dirac delta distributions. As an application, we use our framework to test the validity of different dynamics proposed to model swarming behavior. (Received September 23, 2015)