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*Inferring interaction rules from empirical data of collective motion in animal groups*

Collective motion in animal groups has been studied rather extensively with a variety of models, but real data to test model hypotheses is scarce, owing to difficulty in gathering such data. Here, I discuss our empirical study to capture movements of surf scoters (a type of duck), collectively foraging in groups of a few hundred individuals near Vancouver, BC. We are able to reconstruct individual trajectories for each individual duck, giving a temporal dimension to the data that proves useful for comparing to dynamic models. We then test hypotheses for inter-individual interactions against the data to develop an individual-based zonal model that captures both the angular preference and overall spatial distribution of neighbors observed in the surf scoter data.