

Identifying stationary phases in animal movement

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Abstract: Movement of organisms is one of the main mechanisms who govern relations between species. Advances in biologging open promising perspectives in the study of animal movements at numerous scales. It is now possible to record time series of animal locations over extended areas and long durations with a high spatial and temporal resolution. Such time series are rarely stationary as the animal may alternate between different movement phases. Those phases are assumed to be linked to some internal states of the animals. Movement models which include a hidden state driven by a Markov process are classically used to address this non stationarity and to assign a cluster to each identified phase. However the Markov assumption induces constraints on the distribution of the length of the different movement phases. We explore an alternative to Markov model based on a segmentation clustering method using change point detection approach which can be combined with different movement models.

Key words: Movement Ecology; Change point detection; Euler approximation;