Understanding animal movement and resource selection provides important information about the ecology of the animal. We present a velocity-based approach for modeling animal movement in space and time. The uncertainty in the observed telemetry locations is accounted for by integrating over the uncertainty within a Bayesian hierarchical modeling framework. A chang-point model for the animal’s response to the environment allows for temporal heterogeneity in the animal’s behavior. Population-level inference on movement patterns and resource selection is obtained through cluster analysis of the parameters related to movement and behavior. We illustrate this approach through a study of northern fur seal (*Callorhinus ursinus*) movement in the Bering Sea, Alaska, United States of America. Results show sex differentiation, with female northern fur seals exhibiting stronger response to environmental variables.