The 12th North American Caribou Workshop,
Happy Valley/Goose Bay, Labrador, Canada,
4–6 November, 2008.

A simple time series approach can be used to estimate individual wild reindeer calving dates and calving sites from GPS tracking data

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In this paper we examined individual movement patterns in 58 GPS collared wild reindeer females. Data was collected over a seven year period between 2001 and 2008 in four different reindeer populations in southern Norway. In total we were able to collect and analyze data from 93 individual calving seasons (1st of May to 1st of June). We tested our data for any patterns or sudden changes in mean daily movement parameters (step-length between 3 hour fixes, turn angle and bearing) in a moving time window of 1 through 7 days. Typically individual movement rates changed from app 1000 to 3000 meters / 3 hour to less than 200 meters / 3 hour during the calving period. Turn angle and bearing also varied temporally although the possible trends in these data were far less evident. By comparing individual movement parameters to observations of females at the calving grounds, we conclude that the observed changes in movement patterns can be used to estimate individual calving dates and to locate individual calving sites.