Marine Mammal Scientific Support Research Programme MMSS/001/1

MR 5.2 Report

Activity classification using state space modelling

Executive summary

The state-space model developed for defining activity budgets on a coarse resolution (6 hours) was used to define activity budgets at a fine temporal resolution (2 hours) based on both geo-centric and hydro-centric movements. Hydro-centric movements (active movement of seals through the water) were estimated by deleting vectors of current from the geographic movement data. ARGOS data were excluded because the temporal resolution of the location data prohibits the delineation of fine resolution activity budgets.

Activity budgets at a 2 hour resolution were successfully defined using the data from 90% of the 76 GPS/GSM tags considered. Problems apparent when defining activity budgets on the coarse resolution (including the estimation of only one diving state) appeared to be reduced when considering the fine resolution. Although there were some spatial differences in apparent foraging on the two resolutions, the activity budgets defined on the coarse resolution did not appear to be subject to consistent biases.

A significantly higher proportion of time was estimated to be devoted to foraging when hydro-centric rather than geo-centric movements were considered, indicating the importance of incorporating data on water movement when modelling activity budgets in marine animals.