

Randall Davis

Diving behavior of marine mammals: Ground-truthing the models

An important technique for understanding the relationships between marine mammals and their environment is to study the animals' behavior patterns. Instruments have mainly tracked the depth and duration of dives, and a few have also succeeded in tracking 3-dimensional movement or biological functions during the dives. The diving behavior of Weddell seals, in particular, has been the subject of many investigations, because these seals can easily be captured and outfitted with recording instruments and because they oblige the researchers with long, deep dives. However, although several attempts have been made to associate dive purpose with dive depth and duration, interpretation of exactly what the animals are doing during the dives has been a matter of conjecture.

As part of a long-term effort to develop more capable data-recording systems for marine mammal research, Randall Davis (Univ of Texas) and several collaborators have deployed custom-designed video + data recorders on Weddell seals. This research has been supported in part by the West Coast & Polar Regions Undersea Research Center (NOAA/NURP).

The video recorders attached to the seals' heads provide direct information about their activities during the dives. In some cases, the activities match predictions from previous studies that had classified dives on the basis of depth and duration, but in other cases they do not. Davis' group proposes that 'ground-truth' data from video recorders may be used to construct higher-confidence models of marine mammal diving behavior. They have been able to identify parameters based on the dive depth, duration, and swimming speed alone, that distinguished the different types of dives. This work is presented in the December 2003 issue of *Marine Ecology Progress Series* (see below).

* Randall W. Davis, Lee A. Fuiman, Terrie M. Williams, Markus Horning, and William Hagey (2003): Classification of Weddell seal dives based on 3-dimensional movements and video-recorded observations. *Marine Ecology Progress Series*, **264**, pp. 109-122.