

1077-92-2562

Jonathan D Cowles, Shandelle M Henson* (henson@andrews.edu) and **James L Hayward.**
A Mathematical Model of Harbor Seal Haul-out.

Harbor seals (*Phoca vitulina*) haul out in response to various environmental factors such as tide, current, time of day, wind, and surf. Mathematical modeling techniques are useful for determining which environmental factors are important and for predicting the number of seals that will haul-out in a given set of environmental circumstances. We counted the number of hauled-out seals hourly for 16 hrs per day over two 14-d tidal cycles at a site in Washington State. We constructed a suite of alternative mathematical models based on different combinations of environmental factors, parameterized each model, and applied information theoretic model selection techniques. The best model contained the environmental factors tide, current, and time of day and explained >45% of the observed variability. The results of this study are site-specific, but the methods used are portable and useful for researchers and wildlife managers interested in monitoring haul-out or population trends over time as mandated by the Marine Mammal Protection Act. (Received September 22, 2011)