

km to the central, northwestern region of the Ross Sea, near the continental shelf break. On average, Weddell seals dived to 134 ± 139 m with a maximum dive depth of 868 m and max dive duration of nearly an hour. While variation in habitat preference exists, Weddell seals typically prefer low slope (flat benthos) and water depths between 350 and 550 m. Areas surrounding Franklin, Roosevelt and Coulman Islands as well as the central-northeastern region of the Ross sea were identified as important foraging areas as indicated by the increased diving density, slower transit rate, and increased time spent in these areas. These parameters reveal identical 'hotspots', indicating stable foraging locations across years. The northern reaches of these areas are located between the two main Circumpolar Deep Water intrusions on the western shelf where primary productivity is higher. This study illustrates the importance of long term tracking in revealing important and previously undiscovered movement patterns and diving behavior of an Antarctic predator that 'goes all the way' to the continental shelf-break.

Fine scale movements and swimming kinematics of blue whales off southern California including reaction to simulated military sonar

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The effects of anthropogenic sound on marine mammal behavior remains poorly understood, particularly with respect to fine-scale movement patterns. We exposed tagged blue whales to simulated navy sonar during the SOCAL10 behavioral response study in Southern California. We used two different high-resolution, suction-cup digital archival tags to examine fine-scale whale movement: DTAGs and Bioacoustic Probes. The Bioacoustic probe, which included a hydrophone, a pressure transducer, and a dual-axis accelerometer, allowed us to estimate speed and pitch. The DTAGs are equipped with stereo hydrophones, a pressure transducer, and three-axis accelerometers and magnetometers. These sensors allowed us to determine fine-scale movement in three dimensions and received levels of sound. Our study included 19 sound exposures, consisting of 11 playbacks of mid-frequency sonar and 8 control playbacks of pseudo-random noise. We analyzed 24 parameters related to dive and body kinematics for each dive before, during and after sound exposure. Statistical models were applied to assess the significance of changes in these parameters in relation to the received sound level and distance from the source to the whale. During some exposures there were increases in speed and changes in ascent behavior as well as an apparent displacement away from the sound source after the onset of exposure. However, no clear responses were seen in these behaviors for other exposures. Given the range of factors that can characterize behavior and the potential for infrequent or subtle reactions, these data highlight the need for sufficient baseline data and a comprehensive understanding of the behavioral (social interactions), ecological (prey distribution), and evolutionary (fight or flight) contexts in which assessments of sound effects are made. Blue whales produce low-frequency calls and have generally not been considered sensitive to mid-frequency sounds, however, the current study indicates they may respond under certain situations.

Environmental factors and their effect on the seasonal aggregations of the Florida manatee (*Trichechus manatus latirostris*) in the Port Everglades and Intracoastal regions of Fort Lauderdale, Florida, 1999-2009

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The Florida manatee (*Trichechus manatus latirostris*) is one of the most endangered marine mammals in United States. The seasonal distribution of the Florida manatee is influenced by feeding locations in the summer and proximity to warm-water refuges during colder months. During the winter manatees adopt a "refuging strategy" and aggregate in warm-water refugia when the ambient water temperature falls below 20°C (68°F). We monitored manatee abundance at the Florida Power and Light Plant in Port Everglades (PPE), Florida, its effluent canal, and the surrounding Intracoastal Waterway from 1999 – 2009. Raw manatee count data and catch per unit effort (CPUE) were compared to numerous environmental factors including air and water temperature; heating degree-days; and diurnal and tidal cycles. These data were also compared to annual synoptic aerial surveys and statewide mortality data. Total manatee counts and CPUE were correlated ($R^2 = 0.8733$) as were CPUE and heating degree days ($R^2 = 0.6995$) for the period 1999 – 2004. Manatee abundance at PPE paralleled the results of the statewide synoptic surveys and other aerial surveys (1999 – 2004). More manatees were seen in PPE in the morning compared to later in the day ($P < 0.05$) during the years 2004 – 2007. The probability of observing a cow/calf pair was greater during high tide compared to low and mid-tides ($P < 0.05$) for the period 2004 - 2009. Total manatee occurrence and the presence of cow/calf pairs were both significantly correlated with water temperature ($P < 0.05$) for the period 2004 - 2009. These results can impact the scheduling of future synoptic surveys (e.g. likely to achieve maximum counts if conducted in the morning at high tide on cold days). This study also documents the importance of Port Everglades as a wintering refuge for the Florida manatee.

Occurrence of Marine Mammals during Four Low-Energy Marine Geophysical Surveys in the South Pacific and Indian Ocean, 2005 to 2007

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Scripps Institution of Oceanography (SIO) conducted visual surveys for marine mammals during four National Science Foundation-funded low-energy marine geophysical (seismic) surveys in the South Pacific and Indian Ocean, from 2005 to 2007. Protected Species Observers (PSOs) watched for marine mammals around the airgun arrays on the R/V *Roger Revelle* and R/V *Melville* as part of the monitoring and mitigation program, required by authorizations issued under the U.S. Marine Mammal Protection Act and Endangered Species Act. Few, if any surveys for marine mammals have taken place in these areas at any time of the year. PSOs observed during daylight hours while underway and nighttime ramp-ups. During SIO's February to March, 2005 survey (41 days) in the southwest Pacific Ocean, PSOs on the *Melville* documented 8 visual sightings of marine mammals: common dolphins, pilot whales, and sperm whales. During SIO's January to March, 2006 survey (43 days) in the Louisville Ridge area of the southwest Pacific Ocean, PSOs on the *Revelle* documented 5 visual sightings of marine mammals: unidentified dolphins, unidentified beaked whales, unidentified Mesoplodon beaked whales,