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USE OF PASSIVE ACOUSTIC TECHNIQUES TO ASSESS RELATIVE DISTRIBUTION AND SEASONALITY OF ANTARCTIC MARINE MAMMALS

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The efficient sound carrying properties of the ocean and the vocal nature of many marine mammals provide an excellent means to monitor these often difficult to study animals. Passive acoustic study allows researchers to be miles away from their instruments and to monitor animals for a year or more. Two types of passive acoustic techniques will be discussed as methods of assessing spatial and temporal distribution of marine mammals. During the large-scale BrokeWest survey of Southern Ocean waters between 30 and 80 degrees east longitude, the spatial distribution of marine mammals was examined using regular deployment of sonobuoys. 145 DIFAR sonobuoys were deployed every 30' of latitude and monitored for the 70 minutes. An initial analysis indicates blue whales were the most commonly recorded species, occurring at 51 of the sonobuoy deployment sites. Other species recorded include: sperm (44 sites), fin (16), humpback (2), sei,(3), and minke whales(1), and leopard (15) and ross (14) seals allowing a map to be drawn of their relative spatial distribution. In addition, seasonality of blue and fin whales were examined over large temporal scales in this same region with bottom mounted acoustic recording devices (ARPs) that sample low frequency sound for year long periods. Two devices were moored at 1900 and 2800m depth in early 2005 and recovered during the BrokeWest cruise. They recorded low-frequency sound (<250 Hz) continuously for nearly 13 months each. Preliminary power spectral density analysis illustrates a seasonal presence of both blue and fin whales with peaks in relative abundance occurring between April and June. The combination of these types of passive acoustic techniques has proven valuable for surveying marine mammals in difficult to study areas and has great potential to help to understand the spatial and temporal distribution patterns of marine mammals in the Southern Ocean.