3:35

2pAB8. Methodological considerations of acoustic playbacks to test the behavioral significance of call directionality in male northern elephant seals (*Mirounga angustirostris*). Marla M. Holt, Stephen J. Insley (UC Santa Cruz Long Marine Lab., 100 Shaffer Rd., Santa Cruz, CA 95060), Brandon L. Southall (UCSC Long Marine Lab. and NOAA Fisheries Acoust. Program, Silver Spring, MD 20910), and Ronald J. Schusterman (UC Santa Cruz Long Marine Lab., Santa Cruz, CA 95060)

While attempting to gain access to receptive females, male northern elephant seals form dominance hierarchies through multiple dyadic interactions involving visual and acoustic signals. These signals are both highly stereotyped and directional. Previous behavioral observations suggested that males attend to the directional cues of these signals. We used *in situ* vocal playbacks to test whether males attend to directional cues of the acoustic components of a competitors calls (i.e., variation in call spectra and source levels). Here, we will focus on playback methodology. Playback calls were multiple exemplars of a marked dominant male from an isolated area, recorded with a directional microphone and DAT recorder and edited into a natural sequence that controlled call amplitude. Control calls were recordings of ambient rookery sounds with the male calls removed. Subjects were 20 marked males (10 adults and 10 subadults) all located at Año Nuevo, CA. Playback presentations, calibrated for sound-pressure level, were broadcast at a distance of 7 m from each subject. Most responses were classified into the following categories: visual orientation, postural change, calling, movement toward or away from the loudspeaker, and re-directed aggression. We also investigated developmental, hierarchical, and ambient noise variables that were thought to influence male behavior.

TUESDAY AFTERNOON, 18 OCTOBER 2005 LA SALLE ROOM, 1:00 TO 5:35 P.M.

Session 2pAO

Acoustical Oceanography and Animal Bioacoustics: Ocean Ecosystem Measurements

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Chair's Introduction—1:00

Invited Papers

1:05

2pAO1. Advancing from pattern to process in Hawaii's near-shore pelagic ecosystem. Kelly Benoit-Bird (College of Oceanic and Atmospheric Sci., Oregon State Univ., 104 COAS Admin. Bldg., Corvallis, OR 97331, kbenoit@coas.oregonstate.edu) and Margaret McManus (Univ. of Hawaii, Honolulu, HI 96822)

Micronekton comprising a near-shore sound-scattering layer around the Hawaiian Islands have been shown to exhibit diel horizontal migrations, moving onshore until midnight and them moving offshore into deep waters where they remain in the day. The reasons for this daily movement pattern have remained unexamined. Moored echosounders were used to describe micronekton migration over a 5-week period. A moored acoustic Doppler current profiler (ADCP), thermistor chains, point current meters, and an autonomous vertical profiler provided a description of the physical circulation. Periodic four-frequency echosounder and ADCP surveys were used to further characterize the micronekton's movement along with water column physics. During surveys, vertical profiles measured zooplankton abundance using the Tracor acoustic profiling system (TAPS) and integrated net tows, micronekton identity and size using an optical imaging system, and primary productivity with a fluorometer. It was found that micronekton are not simply tracers of water mass movement indicating active migration. Near-shore waters had significantly higher biomass of zooplankton during nighttime hours than offshore waters, suggesting micronekton have greater access to food resources as a result of their migration. Primary productivity was also significantly higher inshore, indicating bottom-up control of this system. These results suggest the underlying reasons behind this daily horizontal movement.

1:25

2pAO2. Bioacoustic absorption spectroscopy: The promise of classification by fish size and species. Orest Diachok (Poseidon Sound, 3272 Fox Mill Rd., Oakton, VA 22124), Paul Smith (Southwest Fisheries Sci. Ctr., La Jolla, CA), Stephen Wales (Naval Res. Lab., Washington, DC), and Carla Scalabrin (Ifremer, Brest, France)

A recently completed experiment, BAS II, was designed to test the validity of inferences of fish length from measurements of bio-alpha in frequency (250–5000 Hz)-depth (8–53 m) space. This experiment was conducted in the vicinity of sardine and anchovy spawning grounds at a 63-m-deep site where oceanic, biological, and geologic parameters were well calibrated. Classifications of absorption lines associated with 15-cm-long sardines, 11-cm-long anchovies, and 6-cm-long juvenile anchovies (recorded at night when most fish were dispersed) were consistent with trawl and historical data. Classification of an absorption line, possibly associated with juvenile sardines, was inconclusive, due to inconsistencies between trawl and historical data. Very low frequency lines may have been due to bubble cloud resonances associated with sardine schools, or larger fish which avoided sampling. The scintillation index