

**4aAA4. Low frequency sound problems found in mixed use buildings that house entertainment venues and residential developments and containment options.** Scott W. Smith (Ballentine Walker Smith, Inc., Kennesaw, GA 30144, bwsacoustics@bellsouth.net) and Steven D. Pettyjohn (The Acoust. & Vib. Group, Inc., Sacramento, CA 95820-1852)

Many problems are to be expected when mixed use buildings include restaurants and residential spaces. When the residential spaces are condominiums and the restaurant becomes a nightclub, the sound problems multiply quickly. The low frequency sound produced in a nightclub featuring music catering to a young crowd is of particular concern. This is partially because of the difficulty of finding remedies once the building construction is complete. This is the situation that arose in a facility recently completed. The nightclub wanted to continue its operation while the condominium owners wanted a resolution of the problem. Sound tests were completed in the residential spaces during operation of the nightclub, but the low frequency content was not always the same, requiring multiple attempts to measure in the source and receiving spaces. Results of these measurements and the recommendations for correcting the problem are presented in this paper. The goal is to provide results of sound measurements made after the recommendations are implemented. Again, sound will be measured in the source and receiver spaces to understand how the noise reduction changed and compared with the predicted sound reduction.

### Contributed Paper

9:25

**4aAA5. An historic conversion: From a bank to a restaurant and residences.** Ioana Pieleanu, Jeffrey Fullerton, and Benjamin Markham (Acentech Inc., 33 Moulton St., Cambridge, MA 02135)

A conversion of an old bank building in Boston's tony South End to a mixed-use building featuring retail on the ground floor and luxury condominiums above was completed in 2007. More recently, a new restaurant (garnering awards for its interior design and rave reviews for its food) has opened in one of the ground floor retail spaces directly below a particularly

noise-sensitive resident. Consultants at Acentech worked on two aspects of the project: first, on the base building as consultants to the architect, and second, on the isolation between the restaurant and the second floor residences as consultants to the restaurant. Using this case study and extensive data measured on site, the authors will discuss best practices to achieve good sound isolation in mixed-use buildings, common pitfalls that result from working with existing historic structures, and some difficulties in achieving the high degree of sound isolation that some luxury condominium owners expect.

THURSDAY MORNING, 21 MAY 2009

GALLERIA NORTH, 8:25 TO 11:50 A.M.

## Session 4aAB

### Animal Bioacoustics: General Topics in Animal Bioacoustics I

Holger Klinck, Chair

CIMRS, Oregon State Univ., Newport, OR 97365

Chair's Introduction—8:25

### Contributed Papers

8:30

**4aAB1. Auditory temporal summation in pinnipeds.** Asila Ghoul (Univ. of California Santa Cruz Long Marine Lab., 100 Shaffer Rd., Santa Cruz, CA 95060), Marla M. Holt (Natl. Marine Fisheries Service, Seattle, WA 98112), Colleen Reichmuth, and David Kastak (Univ. of California Santa Cruz Long Marine Lab., Santa Cruz, CA 95060)

In addition to improving the understanding of auditory processing in pinnipeds, direct measures of temporal summation are relevant to the selection of signal parameters when conducting audiometric research, assessing the effects of signal duration on communication ranges, and evaluating the potential auditory impacts of anthropogenic signals. In the present study, individuals from three pinniped species were tested to determine how signal duration influenced pure-tone hearing thresholds. The psychophysical method of constant stimuli was used to obtain aerial thresholds for each subject at nine different signal durations ranging from 25 to 500 ms. Parameter estimates derived for a California sea lion (*Zalophus californianus*) from an exponential model of temporal summation yielded time constants ( $\tau$ ) of 176, 98, and 141 ms at frequencies of 2.5, 5, and 10 kHz, respectively. Preliminary results with a northern elephant seal (*Mirounga angustirostris*) at 5 kHz (this study), and a harbor seal (*Phoca vitulina*) at 2.5 kHz [M. M. Holt et al., J. Soc. Am. **116**, 2531 (2004)] show similar values for ( $\tau$ ), 134 and 144 ms, respectively. These time constants are similar to those of other mammals

tested and do not appear to vary with respect to frequency.

8:45

**4aAB2. Annual temporal patterning in the vocalizations of captive seals: Two long-term case studies.** Colleen Reichmuth and Ronald J. Schusterman (Inst. of Marine Sci., Univ. of California Santa Cruz, 100 Shaffer Rd., Santa Cruz, CA 95060)

Seasonal changes in vocalizations occur in a variety of species. Factors such as the condition of conspecifics, physiological states that in turn may be related to environmental cues, and developmental and individual differences all potentially influence temporal changes in sound production. In the present study, the vocal behavior of two captive seals was monitored daily for over 10 yrs. Both seals were housed in the absence of conspecifics from the age of 1 yr extending past sexual maturity. The male harbor seal (*Phoca vitulina*) began characteristic underwater vocal displays at the age of 6. Intense periods of acoustic activity lasted weeks to months, overlapped with the breeding activity of local harbor seals, and comprised stereotypic sound emissions that were structurally similar to those reported for wild seals. The female northern elephant seal (*Mirounga angustirostris*) produced aberrant intense airborne vocalizations from the age of 4 that were annually synchronized to a period of approximately 5 weeks coinciding with estrous. Endogenous changes appear to trigger these behavioral cycles, presumably as a