

estimated by the GLGs were then compared with estimates derived from the two traditional methods of reading the GLGs (from the GLG ages not used in  $K_{ASP}$  estimation). For the fin whales an  $K_{ASP}$  of 0.0011/yr (SE  $\pm$  0.00005) and a D/L ratio at birth ( $(D/L)_0$ ) of 0.028 (SE  $\pm$  0.0012) was determined. For the harbour porpoises a AAR rate of 0.0031/yr (SE  $\pm$  0.0004) and a  $(D/L)_0$  value of 0.023 (SE  $\pm$  0.0018) were determined. The fin whale racemization rate is in agreement with rates for other baleen whales, whereas the harbour porpoise rate is considerably higher. Comparison of age estimates, of both fin whales and harbour porpoises, by the AAR and the GLG methods showed no statistical significant difference. Simultaneously with this study, a freshly stranded fin whale got age estimated to a 120 (SE  $\pm$  27.2) yrs, making it the oldest studied fin whale.

### Annual and diurnal diving behavior of adult Saimaa ringed seals

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The Saimaa ringed seal (*Phoca hispida saimensis*) is a critically endangered subspecies living landlocked in Lake Saimaa in southeastern Finland. Previous studies have shown that there are seasonal differences in the diving behavior of the Saimaa ringed seals. To study the diving behavior more precisely, eight adult Saimaa ringed seals were tagged with GPS/GSM devices (SMRU, Scotland) during the years 2007-2010. The study was carried out in Lake Haukivesi, which is one of the interconnected basins in Lake Saimaa. Overall, over 270 000 two-dimensional dives (ranging from 424 to 81 433 dives per seal) were used to characterize the diving behavior of the seals. The mean ( $\pm$  SD) dive depth was 9.7  $\pm$  6.7 m. The maximum depth attained was 51 m, which is also the maximum depth of the study area. The mean dive duration was 3.5  $\pm$  2.8 min, with a maximum of 25.5 min. Dive duration correlated positively with the maximum depth. The dive duration ( $n = 7$  seals) during the open-water season was on average 3.7  $\pm$  2.7 min and extended to 10.5  $\pm$  6.7 m. During wintertime the average dive duration ( $n = 3$  seals) was shorter; lasting 2.5  $\pm$  3.4 min and extended to 5.3  $\pm$  4.9 m. In addition, the dives were classified into different shapes and the distribution of the dive types and their spatial occurrence was studied. The preferred foraging and resting (sleep diving) areas and the possible annual changes were estimated. This is the first time that Saimaa ringed seal diving behavior has been tracked with this level of accuracy.

### Seismic Airgun Sounds and Whale Vocalizations Recorded in the Fram Strait and Greenland Sea

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Low-frequency (< 1 kHz) noise associated with human offshore activities has increased significantly over the last 50 years. Of growing concern is the effect this noise increase might have on protected species, such as baleen whales, that use low-frequency sound for communication and navigation. Of special interest are areas, such as the Arctic, where anthropogenic noise levels are relatively low but could change dramatically in the future as sea ice continues to shrink. In 2009 we deployed two calibrated autonomous hydrophone recorders in the Greenland Sea and Fram Strait to document background noise levels and the low-frequency calls from whales in these areas. These instruments recorded underwater ambient sound continuously for one year at a sampling rate of 2 kHz.

Ambient noise levels were then summarized via long-term spectrogram analysis, and we used automatic detection algorithms to determine the presence of vocalizing whales. The 20 Hz pulses of fin whales (*Balaenoptera physalus*) were the most prominent biological sounds recorded. These sounds were recorded primarily in the fall and early winter months. Sounds from blue whales (*Balaenoptera musculus*) and sperm whales (*Physeter macrocephalus*) were also recorded; upcalls from North Atlantic right whales (*Eubalaena glacialis*) were not detected in these data. Background noise levels were dominated by the sounds from seismic airguns during the spring, summer and fall months; during summer these sounds were recorded in all hours of the day and in all days of a month. Multipath propagation of airgun shots often resulted in a received sound of longer duration and a shorter intershot interval than observed previously, increasing the likelihood of that whale vocalizations could be masked. Future increases in ship traffic coincident with melting sea ice will increase ambient noise levels, potentially affecting the numerous species of vocalizing whales using this area.

### Recent winter sightings of minke whales (*Balaenoptera acutorostrata*) in the South Atlantic Bight

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The summer feeding grounds of the minke whale (*Balaenoptera acutorostrata*) in the western North Atlantic are well-documented, but its winter distribution and the location of its calving grounds are currently unknown. Sporadic winter sightings and strandings in the Caribbean and Florida suggest an offshore breeding and calving area somewhere in this region (Mitchell 1991). We present recent sightings of minke whales in the South Atlantic Bight during winter, and examine these together with historical sighting and stranding records from the region. We conducted monthly aerial surveys at two proposed U.S. Naval training exercise areas in Onslow Bay, North Carolina (June 2007 to April 2011) and off Jacksonville, Florida (January 2009 to April 2011). Minke whales were observed nine times (13 individuals) in the Jacksonville site: six singles, two pairs, and one mom/neonate pair with an adult escort. In the Onslow Bay site, minke whales were encountered twice (one single and one mom/calf pair). All sightings occurred in winter, between late December and February, in waters offshore of the continental shelf-break. A review of historical (1980-2010) sightings ( $n=22$ , provided by the North Atlantic Right Whale Consortium) and strandings ( $n=6$ , provided by NOAA Fisheries) in the mid- and southeast Atlantic, revealed that most minke whale sightings occurred during winter and spring (15 and 4, respectively), rather than in summer and fall (3 and 0, respectively). Most winter sightings (10 of 15) occurred off Florida, while all spring and summer sightings (7) occurred off North Carolina and Virginia. All strandings were of calves and occurred in North Carolina, with most in winter and spring (5 of 6). These data suggest that the southeastern U.S. may be an important habitat for minke whales in winter, and may include their calving grounds.

### Association patterns of female Indo-Pacific bottlenose dolphins off Amakusa, western Kyushu, Japan.

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