gradually became more buoyant as they foraged at sea, as assessed by changes in drift rates. The cost-of-transport (i.e. COT, assessed by the number of strokes m^{-1}) during dives decreased in the buoyancy-hindered direction (i.e. ascending; 0.41–0.30 (PB) and 0.36–0.12 (PM) strokes m^{-1}), but increased to a lesser extent in the buoyancy-aided direction (i.e. descending; 0.02–0.05 (PB) and 0.04–0.16 (PM) strokes m^{-1}) as seals became less negatively buoyant. Overall, the round-trip COT gradually decreased (0.22–0.17 (PB) and 0.20–0.14 (PM) strokes m^{-1}) and was lowest when neutral buoyancy was achieved (c. 0.14 strokes m^{-1}; neutral buoyancy was achieved by only three PM seals). At neutrally buoyant condition, the COTs during descent and ascent were equivalent. Seals spent more time at the bottom of the dives (i.e. foraging layer) when their round-trip COT was lower, possibly because they were able to use the oxygen saved from reduced locomotory costs during the transit to prolong their foraging time. These results suggest that buoyancy changes in the seals affect not only energy expenditure and oxygen utilization during locomotion but also energy gain via increased time spent in the foraging layer.

A key for survival: energy balance of prey selection in deep-diving pilot whales

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The survival of a social group depends on the foraging decisions of each individual and of a balance in sharing foraging resources among group members. Data from multisensor DTAGs attached to 80 short-finned pilot whales show that they perform different foraging tactics: sprinting at depth to target few rewarding prey, and less energetic night-time hunting of more prey per dive in the deep scattering layer. These tactics seem adapted to target a range of prey with variable cost-benefit trade-offs. Here, these trade-offs are uncovered using: i) independent estimates of relative hunting energetic costs per dive from indirect respirometry, ODBA and speed-dependent hydrodynamic drag; ii) estimations of abundance and depth-distribution of prey derived from the echolocation activity of the whales. Results show that there are cheap and expensive foraging tactics and the post-dive oxygen uptake is well predicted by the depth and the speed reached during each dive. The combination of the drag-cost and the number of prey targeted per dive indicates minimum differences of up to 40 times in the caloric value of prey targeted with different tactics. Diving capabilities are related to body mass, however, large adult males and smaller females/sub-adult males reach similar maximum depths and speeds. In contrast, juveniles only perform “cheap” dives, foraging shallower/slower than adults, probably because of the higher mass-specific metabolic rate and lower oxygen stores of young. This apparent ontogenetic partial niche segregation and the broad diet-breadth of short-finned pilot whales may be essential to sustain the large and cohesive social groups of this top-predator in the deep ocean. Knowing about the foraging requirements of deep-water top-predators is essential to predict the potential impacts of expanding mesopelagic fisheries. Overfishing in coastal areas has affected local populations of top-predators and it is timely to manage fisheries to prevent these effects in deep waters.

Abundance estimation of Ganges river dolphins by acoustic-visual mark recapture method

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Population fragmentation is a strong concern for the conservation of aquatic mammals in coastal and freshwater systems. Precise abundance estimation of each local group is required. However, sparsely distributed rare aquatic species, such as baiji and vaquita, have not been easy to find and count despite extensive survey effort. Here we propose a newly developed abundance estimation model using acoustic-visual mark-recapture and applied it to calculate the existing number of Ganges river dolphins (*Platanista gangetica gangetica*) present in a 28 km stretch of Ganges River near Narora, south-east of Delhi, India. This resident population was artificially separated from the downstream population by a barrage that raised concerns for the survival of this population. Two visual observers on a research boat recorded group size of dolphins appearing on either side of the boat. A stereo ultrasonic pulse event recorder (A-tag) towed 30 m behind the boat recorded an independent bearing angle of each detected biosonar sound that corresponds to an individual dolphin. An acoustic-visual recapture was defined as detection by both means within a pre-fixed time window. It is known that the abundance estimator strongly depends on the arbitral length of the time window. The proposed model calculated the detection probability of a single animal separately from group size effect. Individual cue detection model combined with group size correction provided estimators of abundance without using pre-fixed time window length. The calculated acoustic and visual detection probability of Ganges river dolphins was 80 % and 67 %, respectively. The estimated abundance of Ganges river dolphins was 25 and 27 individuals by the two proposed estimators. In the same 28 km stretch, extensive visual observation by another research group estimated 28 individuals independently. The proposed model seemed to be effective for abundance estimation of sparsely distributed dolphins.

Are you my mother? A test of matrilineal social organization in mass strandings and living groups of rough-toothed dolphins

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Rough-toothed dolphins (*Steno bredanensis*) are reported to form isolated communities with stable groups around some oceanic islands. Within these communities, this species exhibits cooperative foraging and care-giving behavior including the sharing of large prey. These group behaviors could be driving community level structure where there are clear differences in habitat use between island groups, and limited movement among islands. Similar social characteristics are found in other cetacean species, e.g. killer whales, where individuals remain in maternally related groups indefinitely, forming "extended matrilines" as reflected by a single mitochondrial (mt) DNA haplotype. Here we test the hypothesis that rough-toothed dolphins also form "extended matrilines" using mtDNA control region haplotypes as a marker for maternal lineages. Alternatively, we test the influence of maternal fidelity on group structure within communities. The sample collection comprises adults from Pacific Ocean Islands and the continental Atlantic USA spanning 1976-2010. We sequenced mtDNA from 4 deceased groups (3 mass strandings and 1 bycatch; 350bp; n=28 teeth samples) and 14 living groups (460bp; n=106 skin samples) identifying 22 haplotypes. Differentiation and haplotype diversity were evaluated for groups within island communities in the Hawaiian Islands (Kauai and Hawaii) and Society Islands (Moorea and Raiatea) as well as between islands communities. Our results revealed multiple matrilines in 16 of the 18 groups, allowing us to reject the hypothesis of strict matrilineal structure. Although an AMOVA detected significant differentiation between island communities, groups did not significantly partition any genetic diversity within island communities. This is consistent with permutation tests where no strong signal of matrilineal influence was identified within island communities. Our study provides evidence of genetic structure at the community level, but demonstrates negligible structure at the group level. Fine-scale analyses to evaluate kinship and temporal association patterns are underway to further our understanding of group structure for this species.

Manatee research and conservation in Cuba

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The manatee (*Trichechus manatus*) is one of the two marine mammal species that occur in the Cuban archipelago. During aboriginal times it played an important role in the diet of ancient tribes. This aspect has been maintained until recent days, and has provoked to great extent the deterioration of Cuban manatee populations. In the current days manatees are protected under diverse and well-structured pieces of legislations. Nonetheless, these efforts are hindered by the current lack of knowledge about the species biology and conservation status in the Cuban archipelago. This lack of scientific information has prompted a new era for manatee conservation and research in Cuba. There is a National Program for the Study and Conservation of Manatees in Cuba. This Program involves several governmental and international institutions that have joined efforts to conduct appropriate manatee research and conservation. Some studies currently in place aim to determine mortality, habitat use and diet in selected locations around the country. A program for captures, health assessment and tagging was started in 2012 in order to assess patterns of manatee movements and habitat use. As one of the main outcomes, this national initiative has helped to set the stage for the implementation of important changes in fishery regulation in Cuba, like the complete eradication of the trawl net fishing in the Cuban platform. The results obtained will help to improve the management of manatees and their habitats in Cuba.

Network-Based Diffusion Analysis Reveals Cultural Transmission of Lobtail Feeding in Humpback Whales

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Understanding the role of cultural transmission in wild animal populations is challenging, but important for an accurate understanding of its taxonomic distribution. Network-based diffusion analysis (NBDA) is a new method which quantifies the extent to which social network structure explains the spread of a behavior. We implemented NBDA to study the spread of a foraging innovation, lobtail feeding, through the Gulf of Maine population of humpback whales (Megaptera novaeangliae) over 27 years using a detailed longitudinal database. Support for models with a social transmission component was 6 to 23 orders of magnitude greater than for models without social transmission. Individual level variables including age, sex, matriline, sightings count, and residency to the Stellwagen Bank National Marine Sanctuary were included in the models. Residency was the only individual variable found to have a significant effect on learning rate, although spatial and temporal distribution of sand lance, a prey species, was also found to have an impact. This demonstrates that multiple factors can influence the acquisition rate of a behavior. Our results, coupled with existing knowledge about song traditions, show that this species can maintain multiple independently evolving traditions in its populations. These insights strengthen the case that cetaceans represent a peak in the evolution of nonhuman culture, independent of the primate lineage.

Incidental dolphin capture and bycatch mitigation in a Western Australian trawl fishery

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The incidental capture of common bottlenose dolphins (*Tursiops truncatus*) is an ongoing protected species management problem in the Pilbara Fish Trawl Interim Managed Fishery, Western Australia. We investigated this issue using four approaches: the analysis of skippers' logbook and independent observer data on bycatch; underwater video of dolphins interacting with trawl gear; genetic methods to estimate population structure and connectivity; and a photo-identification study to estimate trawler-associated dolphin community size. Logbooks and observer records were used to assess dolphin bycatch patterns from 2003 to 2009. During this six year period, between 172 and 366 dolphins were reported caught across all management areas, depths and seasons. Dolphin capture rates reported by independent observers varied between 1.6 and 3.8 times higher than those reported by skippers, with observer records also better explaining the variation in dolphin bycatch. Significant predictors of dolphin bycatch were fishing vessels; time of day; and whether nets included bycatch reduction devices. Underwater video footage taken inside trawl nets indicated that even the observer records underestimated bycatch, as some dead dolphins fell out of bottom-opening escape hatches during trawls and were not landed on deck. Genetic evidence suggested one panmictic population, but no connectivity between trawler-associated and adjacent coastal dolphins. Mark-recapture analysis of photo-identified dolphins around one of three trawlers over two one-week fishing trips yielded a global mean estimate (± 1 SE) of just 183 ± 11 dolphins. These data indicate that a relatively small dolphin community shows fidelity to foraging around trawlers over periods ranging from weeks to years. Potentially, an overall reduction in fishing effort and improved bycatch reduction devices (with top-opening escape hatches from which air-breathing animals might escape) would reduce bycatch. The vulnerability of this dolphin population to depletion from the