whole vibrissae. Principal components were calculated for the Fourier coefficients of each harmonic in the outline. In addition, traditional morphometric measurements (crest width, trough width and peak-to-peak distance) were collected to determine which morphometric method best explained shape differences among species. MANOVA results on both methods showed significant ($p < 0.01$) separation between species with smooth vibrissae and species with beaded vibrissae. Phocids with beaded vibrissae, a phocid with smooth vibrissae, and otariids each occupied unique morphospace in the geometric morphometric analysis. In the traditional morphometric analysis, one phocid (bearded seals) and otariids partially overlapped, but occupied distinct morphospace from phocids with beaded vibrissae. Phocids with beaded vibrissae overlapped considerably with each other in the results of both methods. The observed vibrissal morphologies have implications for modulating environmental stimuli, and the resulting vibrotactile reception. Characterization of the shape of pinniped vibrissae will be important in continued evaluation of the functional roles of these structures.

The US Navy's Adaptive Management Plan for Marine Mammal Conservation

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The US Navy is engaged in the third year of an adaptive management process covering millions of square miles of Navy training and exercise ranges across the US EEZ and Pacific Islands. In addition to a well-known basic and applied research program the Navy conducts annual marine mammal surveys and monitoring efforts to improve our knowledge of marine mammal distribution, abundance and trends throughout our Navy ranges. These efforts are coordinated and updated annually through an adaptive management process, the Integrated Comprehensive Monitoring Program (ICMP) that involves NMFS, MMC, other federal agencies, environmental non-government organizations and scientific experts. The process has proven remarkably effective at updating our collective understanding of an emerging and still poorly understood environmental issue, while enabling continued national security readiness with increasing confidence that such activities are conducted with the least possible environmental impact.

Perception of optic flow in harbor seals (*Phoca vitulina*)

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For marine mammals migrating under water, vision is often restricted because of darkness and/or turbidity, so that usage of this sensory modality for underwater orientation seemed doubtful. However, particles in the water column principally would allow for the use of an orientation mechanism called “optic flow”, the perceived visual motion of objects as the observer moves relative to them. Experiments on optic flow in humans showed, that it can be used for orientation not only by estimating the direction of self motion (‘heading’), but also for more complex tasks like path-integration. In a first step we determined the ability of a harbor seal to estimate its heading by means of optic flow. A computer-generated 3D scatter-plot was presented on a projection screen (2x3m) under water. The origin of each single point (focus of expansion, FOE) was programmed to be on various positions around the centre of the projection screen, covered by a ring-like mask that impeded the direct view on the FOEs. For a trial the test animal had to station in front of the projection screen. After a few seconds of projection, a small reticle was projected, congruent or deviating from the FOE from 0.25° up to 8°. Positions of FOE and different deviations were pseudo-randomly presented, congruent and deviating trials were counterbalanced from session to session. The task of the animal was to decide whether the position of the superimposed reticle matched that of the FOE. The results of this experiment showed, that the tested seal was able to determine the focus of expansion within the scatter-plot with an accuracy of less than 1° deviation. Thus, using optic flow the animal would be able to keep its swimming direction constant, an important prerequisite to perform path-integration.

Satellite tracking of seasonal beluga (Delphinapterus leucas) movements in the White Sea.

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Belugas occupy the White Sea (WS) throughout the year. It is suggested that in summer beluga abundance is the highest (in July it reaches 5000-7500 individuals), but in winter most belugas migrate into the Barents and Kara Seas, and only a small part stays in the WS overwinter. Females with calves are mostly residential, while adult male groups migrate beyond the WS. Of a particular interest is where adult males spend winter. To answer this question, we satellite location-only transmitters "Pulsar" (manufactured in Russia) were deployed on 5 adult beluga males, 322-378 cm in length, caught in the end of October 2010 in the mouth of the Varzuga River, Kola Peninsula. During the entire tracking period (7 months until present – end of May) belugas have not left the WS. In November, they stayed within 30 km from the capture place and performed short movements along the coast. In early December, belugas started to move more actively in the central part of the WS. This activity coincided with the beginning of the ice formation process in coastal regions and in the bays. In mid-January, when almost the entire sea-surface froze, belugas concentrated in deep-water broken ice areas ignoring the ice-free areas of the same depth. In early March, the southern wind almost completely cleared the WS from ice, and belugas resumed active movements in the central part, Dvina Bay and at the entrance of the Kandalaksha Bay. In late April, all belugas almost simultaneously moved from the central areas to the north, to the border with the Barents Sea, where they have been staying until present at a big river mouth. During the observation period, belugas never visited shallow-water (<50m deep) Onega Bay. Thus, beluga males remain in winter in the WS and use the basin depending on ice conditions.

The effectiveness of an anti-helminthic treatment in improving the body condition and survival of Hawaiian monk seals

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Food limitation is a significant factor affecting the juvenile survival of Hawaiian monk seals (*Monachus schauinslandi*) in the Northwestern Hawaiian Islands. Previous research indicates that juvenile monk seals infected with cestodes are in worse body condition than those uninfected. To test if intermittently reducing parasite burden boosts individual growth and survivorship, we initiated a deworming study