

### In this review:

- A. Recent articles – no abstract available
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## A. Recent articles – no abstract available

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Ilangakoon, A.D. and Tun, T. **Rediscovering the Dugong (*Dugong dugon*) in Myanmar and capacity building for research and conservation.** *Raffles Bulletin of Zoology* 55(1): 195-199, 2007.

Morell, V. **Killing whales for science?** *Science* 316(5824): 532-534, 2007.

Higham, J.E.S. and Lusseau, D. **Urgent need for empirical research into whaling and whale watching.** *Conservation Biology* 21(2): 554-558, 2007.

Campagna, C., Falabella, V., and Lewis, M. **Entanglement of southern elephant seals in squid fishing gear.** *Marine Mammal Science* 23(2): 414-418, 2007.

Donohue, M.J. and Foley, D.G. **Remote sensing reveals links among the endangered Hawaiian monk seal, marine debris, and El Nino.** *Marine Mammal Science* 23(2): 468-473, 2007.

Wiig, Ø, Bachmann, L., Janik, V.M., Kovacs, K.M., and Lydersen, C. **Spitsbergen bowhead whales revisited.** *Marine Mammal Science* 23(3): 688-693, 2007.

Palumbi, S.R. **Economic ecology - In the market for minke whales.** *Nature* 447(7142): 267, 2007.

## B. Recent articles with abstracts

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Debrot, A.O., Van Buurt, G., Caballero, A., and Antczak, A.A. **A historical review of records of the West Indian manatee and the American Crocodile in the Dutch Antilles.** *Caribbean Journal of Science* 42(2): 272-280, 2006.

**Notes:** We discuss the significance of two manatee records for the Dutch Windward Islands (Saba, St. Eustatius, St. Maarten) as well as six manatid and one crocodile record for the Dutch Leeward Islands (Aruba, Bonaire, Curacao). The persistence of the manatee in the Lesser Antilles until the early 17<sup>th</sup> century suggests that in pre-Columbian times manatees would have also occurred regularly in the Dutch Windward Islands. In pre-Columbian times, suitable habitat for the American crocodile was sufficient in the Dutch Leeward Islands to have supported small resident populations, and habitat for the manatee was possibly also present. Both species have been widely hunted by early humans and we surmise that small, isolated populations of these species could easily have been extirpated in the Dutch Leeward Islands well prior to European colonization. However, two manatee sightings within the last five years, suggest that these islands may somehow still form part of the active range of this rare and elusive species.

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Miller, A.R. and Dolsak, N. **Issue linkages in international environmental policy : the International Whaling Commission and Japanese development aid.** *Global Environmental Politics* 7(1): 69-96, 2007.

**Notes:** This article examines whether a country's vote in the International Whaling Commission (IWC) influences the bilateral aid it receives from Japan. While whaling is of marginal importance to the Japanese economy, it carries significant cultural and emotional value in Japan. The puzzle, then, is whether Japan links the issues of IWC voting and bilateral aid provision. Does Japan reward countries that vote with it at the IWC by disbursing higher levels of bilateral development aid to those countries? To examine this puzzle, we examine IWC votes of 26 developing countries over 1999-2004 along with their development needs and economic ties with Japan. Our analysis suggests that Japanese bilateral aid to developing countries is significantly associated with the countries' IWC voting records. These results hold across a range of statistical specifications. Thus, our article provides evidence to suggest that Japan has employed material incentives to defend its cultural preferences regarding whaling in the face of opposition from pro-conservation IWC members and environmental NGOs.

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Pitcher, K.W., Olesiuk, P.F., Brown, R.F., Lowry, M.S., Jeffries, S.J., Sease, J.L., Perryman, W.L., Stinchcomb, C.E., and Lowry, L.F. **Abundance and distribution of the eastern North Pacific Steller sea lion (*Eumetopias jubatus*) population.** *Fishery Bulletin* 105(1): 102-115, 2007.

**Notes:** The eastern Steller sea lion (*Eumetopias jubatus*) population comprises animals that breed along the west coast of North America between California and southeastern Alaska. There are currently 13 major rookeries (> 50 pups): five in southeastern Alaska, three in British Columbia, two in Oregon, and three in California. Overall abundance has increased at an average annual rate of 3.1% since the 1970s. These increases can largely be attributed to population recovery from predator-control kills and commercial harvests, and abundance is now probably as high as it has been in the last century. The number of rookeries has remained fairly constant ( $n=11$  to 13) over the past 80 years, but there has been a northward shift in distribution of both rookeries and numbers of animals. Based on the number of pups counted in a population-wide survey in 2002, total pup production was estimated to be about 11,000 (82% in southeastern Alaska and British Columbia), representing a total population size as approximately 46,000-58,000 animals.

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MacLeod, C.D., Santos, M.B.A., Reid, R.J., Scott, B.E., and Pierce, G.J. **Linking sandeel consumption and the likelihood of starvation in harbour porpoises in the Scottish North Sea: could climate change mean more starving porpoises?** *Biology Letters* 3(2): 185-188, 2007.

**Notes:** Sandeels are known to be negatively affected by climate change in a number of ways. This study investigated whether these changes are affecting the harbour porpoise (*Phocoena phocoena*), a species which consumes sandeels. Porpoise diet was examined in spring (March-May), a critical time of year for survival when sandeels are important prey, from 1993 to 2001 to provide baseline information on the proportion of sandeels consumed. When data from spring 2002 and 2003 were compared to these baseline data, the diet was found to be substantially different, with a significant and substantially smaller proportion of sandeels being consumed in March and May. There were also differences in the number of porpoises starving between the two time periods (33% in spring 2002 and 2003 died of starvation, but only 5% in the baseline period). This suggests that a lower proportion of sandeels in the diet of porpoises in spring increases the likelihood of starvation. Therefore, we suggest that the negative effects of climate change on sandeel availability may have serious negative effects on harbour porpoise populations in the North Sea by increasing the likelihood of starvation in spring.

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Mos, L., Tabuchi, M., Dangerfield, N., Jeffries, S.J., Koop, B.F., and Ross, P.S. **Contaminant-associated disruption of vitamin A and its receptor (retinoic acid receptor a) in free-ranging harbour seals (*Phoca vitulina*).** *Aquatic Toxicology* 81(3): 319-328, 2007.

**Notes:** Polychlorinated biphenyls (PCBs) have been associated with a number of toxic effects in marine mammals such as endocrine disruption and immunotoxicity that, in turn, are widely thought to have contributed to population level impacts including reproductive failure and outbreaks of disease. In this study, the dietary hormone vitamin A and expression levels of one of its receptors, retinoic acid receptor a (RARa), were used as biomarkers of PCB-associated health effects in harbour seals. Harbour seal pups ( $n = 24$ ) were live-captured in coastal British Columbia, Canada, and Washington State, USA and

sampled for whole blood (to obtain peripheral blood mononuclear cells, PBMCs) and blood plasma, as well as biopsies of blubber and skin. Concentrations of circulatory vitamin A (retinol) in plasma and stored vitamin A in blubber were negatively associated with blubber PCB concentrations ( $R = -0.518, p = 0.013$  and  $R = -0.645, p = 0.009$ , respectively). However, vitamin A concentrations in skin, an important target tissue, remained constant, which likely reflects a compensatory transfer from blubber to maintain physiological functions. In addition, we characterized the harbour seal RARa, and investigated its expression levels as a potential biomarker in seals. RARa expression in blubber, but not on PBMCs, was elevated in more contaminated animals ( $R = 0.580, p = 0.009$ ). This may represent a direct contaminant-related effect, or, a compensation for the contaminant-related disruption of (circulatory and/or blubber) hormone levels. Since vitamin A is critical to developmental, reproductive and immunological health, our observations of a contaminant-related disruption of its physiology in free-ranging seals may portend population level consequences. Vitamin A concentrations and RARa expression levels can therefore represent relevant and sensitive biomarkers of PCB-associated toxic effects in toxicological studies of marine mammals.

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Lodi, L. and Rodrigues, M.T. **Southern right whale on the coast of Rio de Janeiro State, Brazil: conflict between conservation and human activity.** *Journal of the Marine Biological Association of the United Kingdom* 87(1): 105-107, 2007.

**Notes:** Between 1993 and 2005, 68 sightings of southern right whales were recorded along 400 km of coastline between Paraty Bay (23°13'S 44°42'W) and Macae (22°22'S 41°47'W), Rio de Janeiro State, south-eastern Brazilian coast. Mother/calf pairs represented 66.1% of sightings. Only solitary individuals showed a distinct pattern of occurrence. Females with calf did not show a distinct pattern of occurrence suggesting their widespread distribution in the area. Analysis of the records and detailed accounts of the sightings of southern right whales reveal that there exist conflicts between the animals and human activities such as harassment and collision with boats during attempted rescues, accidental entanglement in fishing nets and intentional mortality, which may have a bearing in the conservation of the species in Brazilian waters.

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Loneragan, M., Duck, C.D., Thompson, D., Mackey, B.L., Cunningham, L., and Boyd, I.L. **Using sparse survey data to investigate the declining abundance of British harbour seals.** *Journal of Zoology* 271(3): 261-269, 2007.

**Notes:** This study presents an analysis of changes in the regional abundance of harbour seals *Phoca vitulina* based on repeated aerial surveys of haulouts, and demonstrates the use of sparse data to deliver advice about population status and management. Generalized linear models with negative binomial errors were used to represent these overdispersed data. The shape parameter of the negative binomial distribution was directly estimated from the data where this was possible. Information from time-series of counts where there were few gaps in the data was used to improve the estimation of this parameter in areas where fewer surveys had been carried out. The results show that the number of harbour seals in eastern England has not increased since the end of the 2002 phocine distemper epidemic. There is also evidence of a general decline in most of the large harbour seal colonies around Britain. The populations in the Inner Hebrides were an exception, with numbers appearing to be stable or increasing. Between 2001 and 2006, the population in Orkney and Shetland declined by 40% (95% confidence interval: 30-50%), indicating harbour seals in these areas experienced substantially increased mortality or very low recruitment over this period. The widespread declines, ranging from Shetland to The Wash, suggest that the causes may have been present over a large part of the North Sea.

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Wang, J.Y. and Yang, S.-C. **Unusual cetacean stranding events of Taiwan in 2004 and 2005.** *Journal of Cetacean Research and Management* 8(3): 283-292, 2006.

**Notes:** In early 2004 and in 2005, several unusual stranding events occurred in Taiwan during a period when large-scale naval exercises were conducted in and on nearby waters. Gross examination of the partial remains of two carcasses (a ginkgo-toothed beaked whale (*Mesoplodon ginkgodens*) and a pygmy killer whale (*Feresa attenuata*)) and an intact Risso's dolphin (*Grampus griseus*) revealed that the former two had internal injuries to structures associated with or related to acoustics or diving. The several unusual stranding events and the findings of the gross *post mortem* examination of the only specimens that were available for study were suggestive that nearby naval exercises may have contributed to or caused the death of at least one cetacean in this region and that species other than beaked whales may also be susceptible to such activities. With an increasing number of military exercises in this region, more attention to the impacts of such activities on cetaceans is needed.

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Currie, D. **Whales, sustainability and international environmental governance.** *Review of European Community and International Environmental Law* 16(1): 45-57, 2007.

**Notes:** The international governance structures in place with respect to whales are dominated by the International Whaling Commission (IWC). However, the IWC's constitutive document, the 1946 International Convention for the Regulation of Whaling (ICRW), lacks many critical elements of good governance which have evolved since the conclusion of the convention. Since the signing of the ICRW, there have been significant and far-reaching developments in the ways and means by which sustainable development and environmental policy is formulated and implemented. Sustainability principles have expanded well beyond limited conservation objectives to include, in particular, the precautionary and ecosystem approaches. International governance has also evolved to require efficient and participation-based decision-making processes, including integrated management and sustainability, efficient and participation-based decision-making processes, international cooperation between States and coordination between international agencies, transparency, and dispute-resolution and compliance mechanisms. These are all elemental aspects of modern environmental governance. Necessary reforms to the ICRW are substantial, and in light of the unanimity required, it is likely that only a new convention will achieve the necessary changes. A governance framework for whales must enable and encourage participants and stakeholders to cooperate in a spirit of global partnership. The goal should be to conserve, protect and restore the health and integrity of the global whale populations as part of the overall goal of the sustainability of the oceans and seas implementing the ecosystem and precautionary approaches. It must integrate with other elements of international governance to that wider goal.

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Newsome, S.D., Etnier, M.A., Gifford-Gonzalez, D., Phillips, D.L., van Tuinen, M., Hadly, E.A., Costa, D.P., Kennett, D.J., Guilderson, T.P., and Koch, P.L. **The shifting baseline of northern fur seal ecology in the northeast Pacific Ocean.** *Proceedings of the National Academy of Sciences [USA]* 104(23): 9709-9714, 2007.

**Notes:** Historical data provide a baseline against which to judge the significance of recent ecological shifts and guide conservation strategies, especially for species decimated by pre-20th century harvesting. Northern fur seals (NFS; *Callorhinus ursinus*) are a common pinniped species in archaeological sites from southern California to the Aleutian Islands, yet today they breed almost exclusively on offshore islands at high latitudes. Harvest profiles from archaeological sites contain many unweaned pups, confirming the presence of temperate-latitude breeding colonies in California, the Pacific Northwest, and the eastern Aleutian Islands. Isotopic results suggest that prehistoric NFS fed offshore across their entire range, that California populations were distinct from populations to the north, and that populations breeding at temperate latitudes in the past used a different reproductive strategy than modern populations. The extinction of temperate-latitude breeding populations was asynchronous geographically. In southern California, the Pacific Northwest, and the eastern Aleutians, NFS remained abundant in the archaeological record up to the historical period 200 years B.P.; thus their regional collapse is plausibly attributed to historical hunting or some other anthropogenic ecosystem disturbance. In contrast, NFS populations in central and northern California collapsed at 800 years B.P., long before European contact. The relative roles of human hunting versus climatic factors in explaining this ecological shift are unclear, as more paleoclimate information is needed from the coastal zone.

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Stolen, M.K., Durden, W.N., and Odell, D.K. **Historical synthesis of bottlenose dolphin (*Tursiops truncatus*) stranding data in the Indian River Lagoon system, Florida, from 1977-2005.** *Florida Scientist* 70(1): 45-54, 2007.

**Notes:** Bottlenose dolphins (*Tursiops truncatus*) are well-known inhabitants of the Indian River Lagoon (IRL) estuary system. In recent years, an increase in stranded animals, concurrent with biological and anthropogenic threats have created concerns about the stability of this population. The objectives of this study were to analyze data collected from stranded IRL dolphins (1977-2005) to: 1) evaluate and understand stranding trends temporally and spatially, 2) examine age and sex-specific mortality patterns, and 3) evaluate trends of human-related dolphin mortalities. A total of 834 dolphins stranded in the lagoon system from 1977-2005. The historical average was 28.8 ( $\pm$  2.48) dolphin strandings per year. We found two years with unusually high numbers of strandings, in 2000 ( $n = 59$ ) and 2001 ( $n = 61$ ). A total of 391 males, 292 females and 151 dolphins of undetermined sex stranded during the study. Strandings occurred more frequently in spring and summer ( $X^2 = 70.96$ ,  $df = 3$ ,  $p < 0.0001$ ). As long-lived, top level predators, IRL dolphin health may be representative of the overall health of this system.

These baseline data are essential to management and conservation efforts for the IRL dolphin population and represent the most comprehensive analysis of mortality trends for IRL dolphins.

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Simmonds, M.P. and Isaac, S.J. **The impacts of climate change on marine mammals: early signs of significant problems.** *Oryx* 41(1): 19-26, 2007.

**Notes:** Climate change is now known to be affecting the oceans. It is widely anticipated that impacts on marine mammals will be mediated primarily via changes in prey distribution and abundance and that the more mobile (or otherwise adaptable) species may be able to respond to this to some extent. However, the extent of this adaptability is largely unknown. Meanwhile, within the last few years direct observations have been made of several marine mammal populations that illustrate reactions to climate change. These observations indicate that certain species and populations may be especially vulnerable, including those with a limited habitat range, such as the vaquita *Phocoena sinus*, or those for which sea ice provides an important part of their habitat, such as narwhals *Monodon monoceros*, bowhead *Balaena mysticetus* and beluga *Delphinapterus leucas* whales and polar bears *Ursus maritimus*. Similarly, there are concerns about those species that migrate to feeding grounds in polar regions because of rapidly changing conditions there, and this includes many baleen whale populations. This review highlights the need to take projected impacts into account in future conservation and management plans, including species assessments. How this should be done in an adequately precautionary manner offers a significant challenge to those involved in such processes, although it is possible to identify at this time at least some species and populations that may be regarded as especially vulnerable. Marine ecosystems modellers and marine mammal experts will need to work together to make such assessments and conservation plans as robust as possible.

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Hall, A.J. and Thomas, G.O. **Polychlorinated biphenyls, DDT, polybrominated diphenyl ethers, and organic pesticides in United Kingdom harbor seals (*Phoca vitulina*) - Mixed exposures and thyroid homeostasis.** *Environmental Toxicology and Chemistry* 26(5): 851-861, 2007.

**Notes:** Polychlorinated biphenyls, DDT and its metabolites, polybrominated diphenyl ethers, and selected organochlorine pesticide concentrations were measured in blubber samples from 60 free-living harbor seals in 2003 from five sites around the United Kingdom coast. Significant regional differences among contaminant levels were found, with seals on Islay and Jura (southwest Scotland) having the highest levels of polychlorinated biphenyls and seals in the Wash (eastern England) having the highest polybrominated diphenyl ether levels. Animals from the north and northeast of Scotland (Orkney and the Moray Firth) had the lowest levels of all the contaminant groups studied. Congener-specific profiles of polychlorinated biphenyls and polybrominated diphenyl ethers showed relatively higher levels of the lower chlorinated and brominated compounds at the more northerly sites, with the lowest total levels of both chemical groups. Significant positive relationships between blubber contaminants and total triiodothyronine (TT3) concentrations were found after controlling for the potential effects of confounding because of sex, mass, and season. Increased serum TT3 levels were significantly related to higher blubber contaminant concentrations in the following order: sum of all contaminants > polybrominated diphenyl ethers > polychlorinated biphenyls > DDT Serum TT3 levels in the harbor seals with the highest exposures might be indicative of a T3 thyrotoxicosis, but without information on free T3 and circulating thyroid-stimulating hormone levels, it is difficult to determine the importance of this observation for the health of the individuals or populations. However, the mixture of contaminants to which United Kingdom harbor seals are exposed has changed over the last few decades, and the toxicological and epidemiological importance of adding the brominated compounds to the classical organochlorine and heavy metal mixture is not known.

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Hodgson, A.J., Marsh, H., Delean, S., and Marcus, L. **Is attempting to change marine mammal behaviour a generic solution to the bycatch problem? A dugong case study.** *Animal Conservation* 10(2): 263-273, 2007.

**Notes:** Incidental bycatch in fishing nets is a global cause of incidental mortality of marine mammals. Two classes of approaches attempt to mitigate this impact: (1) approaches that change the behaviour of the fisher (e.g. closures and gear modifications), (2) approaches that attempt to change the behaviour of the bycatch species (e.g. acoustic alarms or pingers). Even though the effectiveness of pingers has been established for very few bycatch species, pingers are now mandatory in many fisheries throughout the world. Pingers are being trialled in commercial gill net fisheries in tropical Australia to reduce

the bycatch of the dugong and three species of coastal dolphins, despite an absence of robust assessments of: (1) their effectiveness in reducing bycatch, (2) the likelihood of alienating bycatch species from critical habitats. We conducted replicate experiments to test the behavioural responses of dugongs to 4 and 10 kHz pingers in an array simulating a net. Each experiment comprised three sequential 10-min treatments in which two pingers were: (1) inactive, (2) active, (3) inactive. The rate of decline of the number of dugongs within the focal arena did not change significantly while pingers were activated. Dugongs passed between the pingers (where a net would be located) irrespective of whether the alarms were active or inactive, fed throughout the experiments and did not change their orientation to investigate pinger noise, or their likelihood of vocalizing. We conclude that: (1) pingers are unlikely to alienate dugongs from critical habitats or reduce dugong mortalities in fishing nets, (2) bycatch mitigation strategies such as pingers that rely on changing animal behaviour should only be used after rigorous testing on all likely bycatch species.

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Burkanov, V.N. and Loughlin, T.R. **Distribution and abundance of Steller sea lions on the Asian coast, 1720's – 2005.** *Marine Fisheries Review* 67(2): 1-62, 2007.

**Notes:** We analyzed published and archived records for the past 250 years to assess changes in distribution and abundance of Steller sea lions, *Eumetopias jubatus*, along the Asian coast from the Bering Strait to the Korean Peninsula. We found that the northern extent of Steller sea lion distribution has not changed but that the southern limit has moved north by some 500-900 km (~300-500 n.mi.) over the past 50 years. Additionally, the number of animals and their distribution has changed on the Commander Islands, Kuril Islands, and Kamchatka Peninsula. We found no changes in the number of rookeries in the northern Sea of Okhotsk, but a new rookery was established at Tuleny Island on the eastern coast of Sakhalin Island. We estimate that the total abundance of Steller sea lions along the Asian coast in the late 19th century was about 115,000 animals; during the 1960's, the total estimate was about 27,000 (including pups), most of which were in the Kuril Islands. The fewest number of Steller sea lions occurred in the northwestern Pacific in the late 1980's-early 1990's when only about 13,000 individuals (including pups) were estimated in the entire region. During the 1990's, and especially in early 2000, an increasing trend in abundance occurred in most areas. Present estimated abundance of Steller sea lions in Asia is about 16,000 individuals (including about 5,000 pups), about half of which occur in the Kuril Islands. Changes in abundance occurred during all time periods but varied by site and period. Specifically, over the past 150 years Steller sea lion abundance at most sites has changed. There were no rookeries on the Commander Islands between 1850 and 1960 and abundance was low, but by 1977, abundance increased to 4,800 individuals and a rookery was established in the mid 1980's; abundance there has declined since the early 1980's and in 2004 only 895 individuals (including 221 pups) were counted during the breeding season. Between 1940 and 2004, abundance along the eastern coast of Kamchatka declined from ~7,000 to ~600 individuals, an overall reduction of 90%. Steller sea lion abundance on the Kuril Islands declined by >90% from the 1800's to 2005; the most severe decline there occurred during 1969-1981. Steller sea lion numbers in the northern part of the Sea of Okhotsk declined during 1930-2002 from 7,200 to 3,100 individuals. Numbers at Tuleny Island have increased since establishment of a rookery there during 1983-2005 and by immigration from other sites.

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Proffitt, K.M., Garrott, R.A., Rotella, J.J., Siniff, D.B., and Testa, J.W. **Exploring linkages between abiotic oceanographic processes and a top-trophic predator in an antarctic ecosystem.** *Ecosystems* 10(1): 120-127, 2007.

**Notes:** Climatic variation affects the physical and biological components of ecosystems, and global-climate models predict enhanced sensitivity in polar regions, raising concern for Antarctic animal populations that may show direct responses to changes in sea-ice distribution and extent, or indirect responses to changes in prey distribution and abundance. Here, we show that over a 30-year period in the Ross Sea, average weaning masses of Weddell seals, *Leptonychotes weddellii*, varied strongly among years and were correlated to large-scale climatic and oceanographic variations. Foraging success of pregnant seals (reflected by weaning mass the following pupping season) increased during summers characterized by reduced sea-ice cover and positive phases of the southern oscillation. These results demonstrate a correlation between environmental variation and an important life history characteristic (weaning mass) of an Antarctic marine mammal. Understanding the mechanisms that link climatic variation and animal life history characteristics will contribute to understanding both population dynamics and global climatic processes. For the world's most southerly distributed mammal species, the projected trend of increasing global climate change raises concern because increasing sea-ice trends in the Ross Sea sector of Antarctica will likely reduce populations due to reduced access to prey as expressed through declines in body condition and reproductive performance.

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Dyck, M.G., Soon, W., Baydack, R.K., Legates, D.R., Baliunas, S., Ball, T.F., and Hancock, L.O. **Polar bears of western Hudson Bay and climate change: Are warming spring air temperatures the "ultimate" survival control factor?** *Ecological Complexity* 4(3): 73-84, 2007.

**Notes:** Long-term warming of late spring (April-June) air temperatures has been proposed by Stirling et al. [Stirling, I., Lunn, N.J., Iacozza, J., 1999. Long-term trends in the population ecology of polar bears in western Hudson Bay in relation to climatic change. *Arctic* 52, 294-306] as the "ultimate" factor causing earlier sea-ice break-up around western Hudson Bay (WH) that has, in turn, led to the poorer physical and reproductive characteristics of polar bears occupying this region. Derocher et al. [Derocher, A.E., Lunn, N.J., Stirling, I., 2004. Polar bears in a warming climate. *Integr. Comp. Biol.* 44, 163-176] expanded the discussion to the whole circumpolar Arctic and concluded that polar bears will unlikely survive as a species should the computer-predicted scenarios for total disappearance of sea-ice in the Arctic come true. We found that spring air temperatures around the Hudson Bay basin for the past 70 years (1932-2002) show no significant warming trend and are more likely identified with the large-amplitude, natural climatic variability that is characteristic of the Arctic. Any role of external forcing by anthropogenic greenhouse gases remains difficult to identify. We argue, therefore, that the extrapolation of polar bear disappearance is highly premature. Climate models are simply not skilful for the projection of regional sea-ice changes in Hudson Bay or the whole Arctic. Alternative factors, such as increased human-bear interaction, must be taken into account in a more realistic study and explanation of the population ecology of WH polar bears. Both scientific papers and public discussion that continue to fail to recognize the inherent complexity in the adaptive interaction of polar bears with both human and nature will not likely offer any useful, science-based, preservation and management strategies for the species.

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Miksis-Olds, J.L., Donaghay, P.L., Miller, J.H., Tyack, P.L., and Nystuen, J.A. **Noise level correlates with manatee use of foraging habitats.** *Journal of the Acoustical Society of America* 121(5): 3011-3020, 2007.

**Notes:** The introduction of anthropogenic sound to coastal waters is a negative side effect of population growth. As noise from boats, marine construction, and coastal dredging increases, environmental and behavioral monitoring is needed to directly assess the effect these phenomena have on marine animals. Acoustic recordings, providing information on ambient noise levels and transient noise sources, were made in two manatee habitats: grassbeds and dredged habitats. Recordings were made over two 6-month periods from April to September in 2003 and 2004. Noise levels were calculated in one-third octave bands at nine center frequencies ranging from 250 Hz to 64 kHz. Manatee habitat usage, as a function of noise level, was examined during four time periods: morning, noon, afternoon, and night. Analysis of sightings data in a variety of grassbeds of equal species composition and density indicate that manatees select grassbeds with lower ambient noise for frequencies below 1 kHz. Additionally, grassbed usage was negatively correlated with concentrated boat presence in the morning hours; no correlation was observed during noon and afternoon hours. This suggests that morning boat presence and its associated noise may affect the use of foraging habitat on a daily time scale.

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Miksis-Olds, J.L., Donaghay, P.L., Miller, J.H., Tyack, P.L., and Reynolds, J.E. **Simulated vessel approaches elicit differential responses from manatees.** *Marine Mammal Science* 23(3): 629-649, 2007.

**Notes:** One of the most pressing concerns associated with conservation of the endangered Florida manatee is mortality and serious injury due to collisions with watercraft. Watercraft collisions are the leading identified cause of manatee mortality, averaging 25% and reaching 31% of deaths each year. The successful establishment and management of protected areas depend upon the acquisition of data assessing how manatees use different habitats, and identification of environmental characteristics influencing manatee behavior and habitat selection. Acoustic playback experiments were conducted to assess the behavioral responses of manatees to watercraft approaches. Playback stimuli made from prerecorded watercraft approaches were constructed to simulate a vessel approach to approximately 10 m in sea grass habitats. Stimulus categories were (1) silent control, (2) approach with outboard at idle speed, (3) vessel approach at planning speed, and (4) fast personal watercraft approach. Analyses of swim speed, changes in behavioral state, and respiration rate indicate that the animals responded differentially to the playback categories. The most pronounced responses, relative to the controls, were elicited by personal watercraft. Quantitative documentation of response during playbacks provides data that may be used as the basis for future models to predict the impact of specific human activities on manatees and other marine mammal populations.

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Shirakihara, M., Yoshida, H., Yokochi, H., Ogawa, H., Hosokawa, T., Higashi, N., and Kasuya, T. **Current status and conservation needs of dugongs in southern Japan.** *Marine Mammal Science* 23(3): 694-706, 2007.

**Notes:** We conducted aerial surveys of dugongs (*Dugong dugon*) using the line-transect method and snorkeling surveys of dugong feeding trails in 1998 and 1999 around Okinawa Island (26°30'N, 128°00'E) and the Sakishima Islands, southern Japan. A total of ten dugongs were sighted and feeding trails were confirmed in the sea grass beds off the east coast of Okinawa Island. In the Sakishima Islands, however, no dugongs were observed, and there was no evidence of feeding trails despite the existence of apparently suitable sea grass beds for feeding. The results of these surveys and other available information suggest that Okinawan dugongs represent a small, geographically isolated population. Our sightings of dugongs during the daytime, offshore of sea grass beds where feeding trails were recorded, suggest that Okinawan dugongs principally feed at night when human activities are limited. Survival of this remnant dugong population is threatened by habitat degradation and occasional entanglement mortality in fishing nets.

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O'Corry-Crowe, G., Taylor, B.L., Gelatt, T., Loughlin, T.R., Bickham, J., Basterretche, M., Pitcher, K.W., and DeMaster, D.P. **Demographic independence along ecosystem boundaries in Steller sea lions revealed by mtDNA analysis: implications for management of an endangered species.** *Canadian Journal of Zoology* 84(12): 1796-1809, 2006.

**Notes:** Previous genetic studies indicate Steller sea lions (*Eumetopias jubatus* (Schreber, 1776)) comprise three phylogeographically distinct populations. However, differences in population trends and ecology and the limited extent of recorded dispersal suggest structure may be present at smaller scales. We examined sequence variation within a longer segment (531 bp) of the mtDNA control region in greater numbers ( $n = 1654$ ) of sea lions from across Alaska than earlier investigations to investigate fine-scale dispersal patterns in Steller sea lions. We detected high levels of haplotypic diversity ( $h = 0.934$ ) and confirmed phylogeographic differentiation between southeastern and western Alaska ( $\Phi_{st} = 0.23$ ,  $P < 0.0001$ ), but also found significant differentiation at regional and local scales. Rookeries in the Gulf of Alaska, eastern Bering Sea, and eastern Aleutians were distinct from rookeries in the central and western Aleutians ( $F_{st} = 0.021$ ,  $P < 0.0001$ ;  $\Phi(st) = 0.017$ ,  $P < 0.0001$ ). The location of this split coincides with an oceanographic divergence between continental shelf and ocean basin waters and with differences in sea lion foraging ecology and population trends. A number of rookeries were also significantly differentiated from nearby rookeries ( $F_{st} = 0.02-0.025$ ,  $P < 0.05$ ), signifying substantial female-mediated philopatry, in some cases, at local scales. These findings have important implications for understanding the ecology of Steller sea lions in relation to marine ecosystems and the causes of population declines, and they provide guidance for management, including the identification of management stocks.

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Johnson, A. and Acevedo-Gutierrez, A. **Regulation compliance by vessels and disturbance of harbour seals (*Phoca vitulina*).** *Canadian Journal of Zoology* 85(2): 290-294, 2007.

**Notes:** The US National Oceanic and Atmospheric Administration established a buffer zone around marine mammals to prevent harassment. The buffer zone varies by species listing status and by geographic area. However, it is unknown the extent to which vessels comply with these buffer zones. We selected harbor seals (*Phoca vitulina* L., 1758) as a case study to describe compliance with the buffer zone. We conducted land-based observations from Yellow Island, Washington State, in a geographic area where the buffer zone is 91 m (100 yards), to estimate vessel distance from hauled-out seals and to evaluate seal response. We recorded 85.7% of kayaks, 57.1% of stopped powerboats, and 4.6% of passing powerboats violating the buffer zone. Seals were disturbed by kayaks and stopped powerboats at distances  $> 91$  m from the haulout sites but not by moving powerboats  $\leq 91$  m from the sites. Hence, compliance of the buffer zone varied with vessel type and vessel activity. We suggest that a larger buffer zone for vessels lingering around the haul-out sites and enforcement of the buffer zone will minimize seal disturbance.

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Pitman, R.L., Perryman, W.L., Leroi, D., and Eilers, E. **A dwarf form of killer whale in Antarctica.** *Journal of Mammalogy* 88(1): 43-48, 2007.

**Notes:** In the early 1980s, 2 groups of Soviet scientists independently described 1, possibly 2 new dwarf species of killer whales (*Orcinus*) from Antarctica. We used aerial photogrammetry to determine total length (TL) of 221 individual Type C killer whales - a fish-eating ecotype that inhabits dense pack ice - in the southern Ross Sea in January 2005. We confirmed it as one of the smallest killer whales known: TL of adult females (with calves) averaged  $5.2 \text{ m} \pm 0.23 \text{ SD}$  ( $n = 33$ ); adult males averaged  $5.6 \pm 0.32 \text{ m}$  ( $n = 65$ ), with the largest measuring 6.1 m. Female Type A killer whales - offshore mammal-eaters - from Soviet whaling data in the Southern Ocean were approximately 1-2 m longer, and males were 2-3 m (up to 50%) longer (maximum length 9.2 m). Killer whale communities from the North Atlantic and in waters around Japan also appear to support both a smaller, inshore, fish-eating form and a larger, offshore, mammal-eating form. We suggest that, at least in Antarctica, this degree of size dimorphism could result in reproductive isolation between sympatric ecotypes, which is consistent with hypotheses of multiple species of killer whales in the Southern Ocean.

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Seafon, R.A. **Dental divergence supports species status of the extinct sea mink (Carnivora: Mustelidae: *Neovison macrodon*)**. *Journal of Mammalogy* 88(2): 371-383, 2007.

**Notes:** The sea mink (*Neovison macrodon* (Prentiss, 1903): Mustelinae) was an unusual late-Cenozoic example of an organism that had rapidly evolved toward a marine niche. Except for the otters, it was probably the most aquatic member of the Musteloidea. Its status as a separate species has not been resolved. A larger relative of the American mink (*N. vison*), it inhabited the shores of New England and possibly the Canadian Maritime Provinces until it was hunted to extinction in the 19th century. Skeletal and skin specimens were not collected by zoologists, but the former are known from Native American archaeological sites. The hypothesis that the sea mink showed dental divergence from *N. vison*, an indication of systematic and ecological distinctness, was tested on 111 dentally mature mink specimens originally collected from the Turner Farm archaeological site (Penobscot Bay, Maine). These teeth, dating from about 5,000 to 250 years ago, were compared with 158 other specimens measured for this study and published data from 78 individuals, representing 4 subspecies of *N. vison* and 22 additional musteloid genera. Thirteen dental measurements were taken on all species and studied using regressions, principal component analysis, and significance testing. Based on comparisons with American mink, it appears likely that the archaeological specimens included primarily *N. macrodon* but also *N. vison*. Although pairs of species within the Lutrinae and genus *Mustela* showed divergence comparable to that of *N. vison* and *N. macrodon*, the dental proportions of male and female *N. vison* and of the several *N. vison* subspecies were nearly identical. These analyses suggest that *N. macrodon* was sufficiently distinct from *N. vison* to support its recognition as a separate species.

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Newsome, S.D., Etnier, M.A., Kurle, C.M., Waldbauer, J.R., Chamberlain, C.P., and Koch, P.L. **Historic decline in primary productivity in western Gulf of Alaska and eastern Bering Sea: isotopic analysis of northern fur seal teeth**. *Marine Ecology Progress Series* 332: 211-224, 2007.

**Notes:** The cause(s) for the declines in marine mammal populations in the North Pacific and Bering Sea over the past 30 yr are unknown, despite progress in understanding the present ecology of this system. Explanations that attribute the declines to long-term decreases in marine productivity and/or short-term shifts in oceanographic conditions have been offered, but few studies have explored the issue from an explicitly historical perspective. Here we present a high-resolution, 52 yr time series of  $\delta^{13}\text{C}$  and  $\delta^{15}\text{N}$  values for teeth of juvenile male northern fur seal *Callorhinus ursinus* collected from a single colony on Saint Paul Island, Alaska in the eastern Bering Sea. Mean annual  $\delta^{13}\text{C}$  declined by  $\sim 1.1\%$ . From 1948 to 2000, while long-term mean annual  $\delta^{15}\text{N}$  did not significantly change. The relatively small but significant long-term decrease in  $\delta^{13}\text{C}$  most likely reflects anthropogenically-driven changes in surface ocean carbon reservoirs and not a decline in primary productivity in the North Pacific and Bering Sea system. To assess short-term shifts in the time series, we detrended the  $\delta^{13}\text{C}$  data; the  $\delta^{15}\text{N}$  time series did not require a correction. The corrected  $\delta^{13}\text{C}$  and uncorrected  $\delta^{15}\text{N}$  values showed low amplitude oscillations with a frequency of  $\sim 20$  to 25 yr that are roughly in phase through time. The relative timing of these oscillations suggest they may be driven by shifts in the Pacific Decadal Oscillation (PDO); however, the frequency of cycles in our time series is approximately half as long as the frequency of the PDO. Finally, mean  $\delta^{13}\text{C}$  and  $\delta^{15}\text{N}$  values suggest that juvenile males modify their migration patterns by Age 3 (GL3, the third year of growth). Specifically, they remain in high-latitude waters year-round (southern Bering Sea and/or western Gulf of Alaska).

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Stensland, E. and Berggren, P. **Behavioural changes in female Indo-Pacific bottlenose dolphins in response to boat-based tourism.** *Marine Ecology Progress Series* 332: 225-234, 2007.

**Notes:** We investigated the behavioural changes of Indo-Pacific bottlenose dolphins *Tursiops aduncus* in response to boat-based tourism at both group and individual levels. The behaviour, movement and dive patterns of nursing females off the south coast of Zanzibar were investigated between January and March 2000 to 2002 and statistical comparisons were made between observations made at different levels of tourist activity. Behavioural data was collected during boat surveys using scan sampling of groups and focal individual follows of 5 female dolphins with calves. The movement patterns of dolphin groups were not affected by the presence of a few (1 to 2) tourist boats without swimmers. However, the groups displayed a significantly larger proportion of erratic (non-directional) movements as tourist activities increased and when swimmers were present. The proportion of active, peduncle, tail-out and porpoise dives also increased as tourist activity increased. Further, females travelled more frequently as tourist activities increased; this may have a negative effect on the time available for females to nurse their calves. Intense non-regulated dolphin tourism in this area may lead to a shift in habitat use by nursing females, and the apparent changes in dolphin behaviour due to the increased levels of tourism may ultimately reduce fitness at both individual and population levels. We urge that the guidelines already issued by the Department of Fisheries and Marine Products, Zanzibar, be implemented and complied with as a first important step towards sustainable dolphin tourism.

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