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How sound from human activities affects marine mammals

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Effects of sound on marine mammals have traditionally been defined either as injury or disruption of behavior. The earliest concern about behavioral disruption was that elevated noise could reduce the range of communication by masking faint signals. Few studies have documented this effect, but recent work emphasizes mechanisms animals use to compensate for elevated noise. Many studies have documented changes in behavior as a function of exposure, but it has proven difficult to relate these to effects on the welfare of individual animals or on the status of populations. Promising approaches to interpreting effects include avoidance of habitat, energetics of foraging, and applying models of anti-predator behavior to human disturbance. During the 1990s acoustic criteria for injury were designated based upon temporary hearing loss. Accumulating evidence of atypical mass strandings of beaked whales coincident with naval sonar exercises suggest that injury or death may result from behavioral responses of some species at lower exposure levels in some settings. A tagged beaked whale showed similar but weaker responses to experimental playback of a mid-frequency sonar sound compared to calls of killer whales, suggesting that anti-predator response may harm animals after exposure to levels of sound very unlikely to cause injury directly.