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**Understanding potential effects of using active sonar to study
marine ecosystems**

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Biological organisms can suffer various kinds of effects when exposed to high intensity sound. Active sonar systems used to investigate marine ecosystems typically have source levels exceeding 220 dB re: 1 μ Pa at 1 m, which are high enough to have an effect on organisms in relatively close proximity. Although these systems operate at frequencies from the low kilohertz to megahertz ranges that are not usually associated with potentially harmful effects in the marine environment, fundamental interactions with sound occur at various biological scales that strongly depend on the size of the organism with respect to acoustic wavelengths. These effects range from subtle changes in behavior to various types of trauma that can result in temporary or permanent hearing loss, or in hemorrhage or even mortality. Examples from the literature will be used to illustrate the basic relationships between biological effects of sound and the size and structure of marine organisms, as well as potential concerns associated with using active sonar to study the marine environment.