

How do Marine Mammals use sound to see?

Marine mammals use both vocal and non-vocal sounds to help them find and capture food. Echolocation is the type of vocal sound used by marine mammals. Using sound to see is important to marine mammals because it allows them to feed in the dark at night and in deep or murky water where it is not easy to see. Echolocation is used mostly by whales to capture single prey items such as fish or squid. Bats are the only other mammals known to use echolocation for feeding.

Echolocation used in feeding is different from sounds used in communication. Vocal signals used for communication provide animals with information about other animals in the area. The signals produced by animals during echolocation provide the animal with information about what is in the area. Animals that use echolocation send high frequency click sounds into the environment. The sounds bounce off the objects, and the echoes are received by the animal that produced them. The animal that made the original clicks can determine how far away an object is based on the time an echo takes to return. The farther away the object is, the longer it takes for the echo to return.

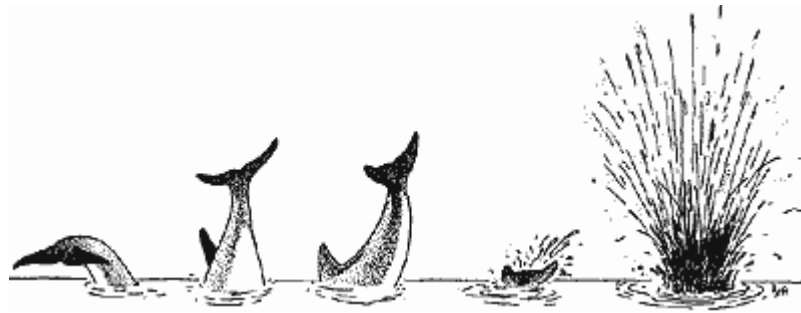
As an echolocating animal gets closer to its targeted prey item, the clicks get faster and faster. The series of echolocation clicks leading up to a capture attempt of a prey item is called click train. As the interval between the clicks gets shorter, the click train starts to sound like a buzz. The returning echoes sound different than the original click produced by the animal. The differences between the sound of the original click and the returning echo that tell the echolocating animal with information about the size, shape, direction, and even making of the object. Dolphins have an amazing ability to detect a target the size of a golf ball almost a football field away. That distance is much further than a dolphin can ever see underwater. The beam of the echolocation clicks is also very directional and can be moved with a slight turn of the animal's head.

Toothed whales and baleen whales also make non-vocal sounds to increase their chances of success during feeding. Humpback whales have produced a way of feeding called bubble feeding. Bubble feeding is done with one or a few whales blowing air from their blowhole while underwater. This produces sound as the bubbles form a cloud, curtain, or column that rises toward the surface. The bubbles trap the prey between the surface and the whales mouth. A bubble net is formed when the bubbles emitted by the whales form a ring and concentrate the prey inside. This helps the whales to see there food more easily.



Bubble Feeding!

Bottlenose dolphins also make use of sound and bubbles. Dolphins feeding in seagrass beds in Australia and Florida use a technique called kerplunking to drive fish from the protection of the sea grasses. A dolphin will lift its tail and lower body out of the water and crash it down on the water surface. This causes a loud splash and creates a trail of bubbles under the water. The bubbles formed by kerplunking function much in the same way as they do during humpback feeding. The bubbles startle the fish hiding in the seagrass and flush them from their hiding places, making it easier for the dolphin to detect them.



Kerplunking!