

## Marine Mammal Strandings

When dead marine mammals drift ashore or living mammals swim or float onto shore and become beached or are unable to return to the water on their own, they are said to be stranded. Although this global phenomenon is not new, causes of strandings are still not well understood. Natural occurrences of stranded marine mammals have been documented for centuries. The Greek philosopher Aristotle contemplated whale strandings phenomena more than 2300 years ago.



The direct cause of most strandings remains unknown due to the variety of uncertainties and phenomena in the marine environment. Scientists have identified a number of contributing factors, including illness and injuries, storms, predator attacks and even toxins from algae, just to name a few. Dramatic increases in the number of strandings in an area are typically connected to an outbreak of infection, such as red-tide or morbillivirus.

### Does Marine Sound Cause Marine Strandings?

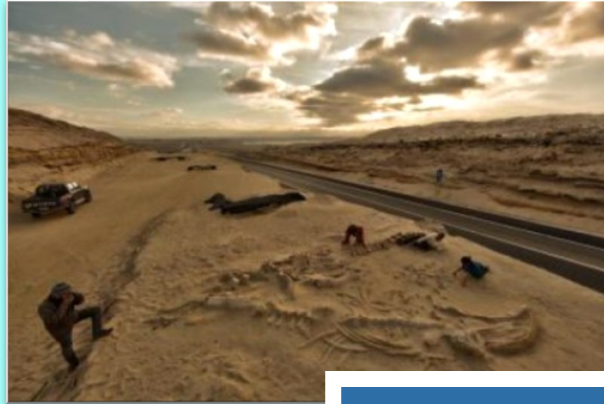
Although some have hypothesized that seismic activities may lead to strandings, no direct correlation has been found. Although beaked whales have shown strong evidence of stranding when exposed to tactical military mid-frequency sonars, seismic survey sounds are quite different from sonars operations—in frequency, direction, and duration—and no conclusive scientific link has been established between seismic surveys and any marine mammal strandings.

There have been a number of studies commissioned by governments around the world looking at stranding events. According to a March 4, 2014 Federal Register Notice (Vol. 79, No. 42, Pg. 12166) issued by the U.S. National Oceanic and Atmospheric Administration (NOAA), “To date, there is no evidence that serious injury, death, or stranding by marine mammals can occur from exposure to air gun pulses, even in the case of large air gun arrays.” And the Canadian Fisheries and Oceans Department has concluded, “...there is no conclusive evidence of cetacean [e.g. whales and dolphins] strandings as a result of exposure to seismic surveys” (Canadian Science Advisory Secretariat (CSAS) Habitat Status Report 2004/002).



## Mitigation

In spite of a lack of evidence linking seismic surveys to strandings, geophysical contractors have implemented industry-wide mitigation practices to avoid impacts on marine species. Regulators and seismic surveyors establish a marine mammal exclusion zone before beginning operations, and they hire trained observers with the authority to stop operations if a sensitive species is spotted within the exclusion zone. Operators also gradually ramp up sound emissions and move their vessels slowly, in order to allow marine mammals to move away from the area before full operation begins.



In this photo, Chilean and Smithsonian paleontologists study several fossil whale skeletons at Cerro Ballena next to the Pan-American Highway in the Atacama Region of Chile in 2011.

*Credit: Adam Metallo, Smithsonian Institution (<http://www.sciencedaily.com/releases/2014/02/140225193414.htm>)*

### *Did you know?*

In 2010 scientists from Chile and the Smithsonian Institution's National Museum of Natural History in Washington DC uncovered the fossilized remains of a mass whale stranding in northern Chile. The fossils are estimated to be between six and nine million years old.



*Credit: Adam Metallo, Smithsonian Institution (<http://www.independent.co.uk/news/science/archaeology/mystery-behind-astonishing-five-million-year-old-whale-graveyard-revealed-9153714.html>)*

### Additional Resources on Marine Mammal Strandings and Seismic Surveys

1. Ancient Whale Stranding in Chile: <https://www.calacademy.org/sciencetoday/reason-behind-ancient-whale-graveyard/5514396/>.
2. Australian Whales, Dolphins and Porpoises – Sonar and seismic impacts: <http://www.environment.gov.au/node/18410>.
3. International Association of Oil and Gas Producers: <http://www.soundandmarinelife.org/>.
4. FAQs - NOAA Fisheries: <http://www.nmfs.noaa.gov/pr/health/faq.htm>.
5. Fisheries and Oceans Canada Research Document - 2008/087: [http://www.dfo-mpo.gc.ca/csas-sccs/publications/resdocs-docrech/2008/2008\\_087-eng.htm](http://www.dfo-mpo.gc.ca/csas-sccs/publications/resdocs-docrech/2008/2008_087-eng.htm).
6. Strandings - NOAA Fisheries: <http://www.nmfs.noaa.gov/stranding.htm>.

### *IAGC Vision Statement*

*The International Association of Geophysical Contractors is the most credible and effective voice for promoting and ensuring a safe, environmentally responsible and competitive geophysical industry.*