

Ship noise boosts stress in whales, 9/11 reveals: study

February 8 2012, by Marlowe Hood



A fin whale spouts off the southern California coast in January 2012. The steady drone of motors along busy commercial shipping lanes not only alters whale behaviour but can affect the giant sea mammals physically by causing chronic stress, a study published Wednesday has reported for the first time.

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The findings were made possible, researchers said, by an event that at first glance seems far removed from the plight of cetaceans: the attacks on New York's Twin Towers on September 11, 2001.

Only a catastrophe of that magnitude, they explained, could have caused

maritime traffic to suddenly drop off, making it possible to measure the impact of varying levels of sound pollution in the sea.

Over the last 50 years noise caused by cargo and military vessels, along with high-decibel sonars used for oil exploration, has gradually increased in intensity and scope.

[Baleen whales](#) communicate at the same low-frequency wavelengths emitted by these ships, in the range of 20 to 200 hertz (Hz), and some species have adapted by emitting louder and more frequent [acoustic signals](#).

Only weeks before the 9/11 attack, scientists led by Rosalind Rolland of the New England Aquarium had undertaken a study of [North Atlantic right whales](#) that congregate in late summer in Canada's Bay of Fundy to feed and nurse their calves.

Starting in July 2001, the researchers used trained dogs to find whale faecal matter floating on the surface of the water. They collected samples over a six-week period every year through 2005.

The whale poop contained hormone-related chemicals, called glucocorticoids, mirroring [stress levels](#) that could change from one day to the next, or even within hours.

When the researchers noticed the drop in underwater noise levels, they realised it would be an opportunity to investigate whether sound pollution was a cause of stress for [right whales](#).

They found that changes in the concentration of the hormone matched perfectly the sudden drop and gradual renewal of [maritime traffic](#) in the area.

"To our knowledge, there were no other factors affecting the population that could explain this difference besides the decrease in ship traffic," concluded the study, published in the Proceedings of the Royal Society B.

Glucocorticoids are secreted in a crisis: aggression by a predator or competitor, starvation, drought. In the short run, this rush of hormones helps animals cope by summoning reserves of energy.

But over the long haul, constant elevations of the hormone due to stressful situations becomes a detriment, leading to stunted growth, a weakened immune system and a compromised ability to reproduce.

Studies of land animals have shown that this kind of [chronic stress](#) can be caused by noise from snowmobiles, along with tourism or road traffic.

Because they live, feed and breed so close to shore, critically endangered North Atlantic whales are already threatened by ship collisions and fishing gear entanglements, two leading causes of death among large cetaceans.

"Acoustic pollution from anthropogenic sources presents a less visible but pervasive disturbance to these coastal-dwelling whales that may have negative consequences for population viability," the study concludes.

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