Humpback whale migration as straight as an arrow

April 22 2011, by Deborah Braconnier

Humpback whale. Credit: NOAA.

(PhysOrg.com) -- Over the last eight years, researchers from the University of Canterbury have been tracking 16 radio-tagged humpback whales through their migratory paths and learned that these whales follow a straight line for thousands of kilometers.

Published in *Biology Letters*, lead author Dr. Travis Horton explained how they fitted these 16 whales with satellite tracking and followed their migratory path from the east coast of Brazil, the Cook Islands and New Caledonia. The tracking provided precise position data and enabled the largest detailed long-term migratory data to date.

Traveling over 6000 kilometers into Antarctic waters, they discovered these whales traveled from 100 to 2000 kilometers at a time in a straight line, never deviating off course by more than a single degree.

While it is believed that most migratory animals navigate with the use of compass clues from the sun or the Earth's magnetic field, these shift by several degrees. Given the fact that the whales maintain a straight course, regardless of weather or currents, researchers believe that they cannot be using one of these alone. As the researchers have said, the Earth's magnetism varies and in water, solar navigation cannot be relied on. They believe it is possible that the whales could be using both together.

Horton also believes that the whales could be using the moon and stars to aid in navigation. Another researcher, John Calambokidis from the Cascadia Research Collective believes there could be another tool aiding the whales. He believes that by using long distance sounds, or songs, the whales may be using these as navigational cues.

While they are only beginning to understand the migratory process of the humpback whale, understanding the mechanism they are using to remain on this straight course will take time. Horton and his team intend to continue with their research.

More information: Straight as an arrow: humpback whales swim constant course tracks during long-distance migration, *Biol. Lett.* Published online before print April 20, 2011, doi: 10.1098/rsbl.2011.0279

Abstract
Humpback whale seasonal migrations, spanning greater than 6500 km of open ocean, demonstrate remarkable navigational precision despite following spatially and temporally distinct migration routes. Satellite-monitored radio tag-derived humpback whale migration tracks in both the South Atlantic and South Pacific include constant course segments of greater than 200 km, each spanning several days of continuous movement. The whales studied here maintain these directed movements, often with better than 1° precision, despite the effects of variable sea-

surface currents. Such remarkable directional precision is difficult to explain by established models of directional orientation, suggesting that alternative compass mechanisms should be explored.