

Sperm whale (*Physeter macrocephalus*) seasonal presence in the southern CalCOFI region



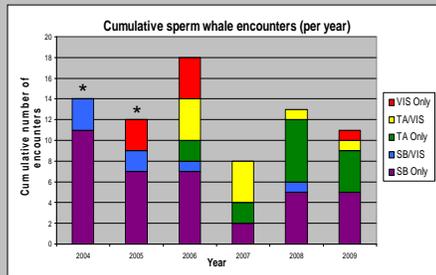
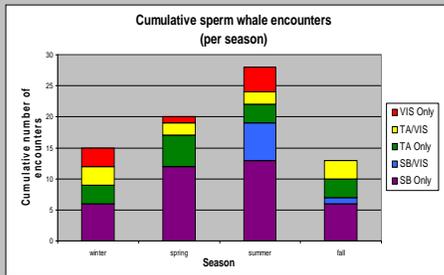
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Summary

Sperm whales (*Physeter macrocephalus*) are odontocetes that are found in all oceans from the tropics to the polar ice edge. They produce sounds for communication and echolocation that are easily detected within a few (up to tens of) kilometers. By monitoring for acoustic signals and conducting visual surveys as part of the quarterly CalCOFI cruises (lines 93-77), we have been able to record sperm whale presence in this region for the past 5.5 years. Using data from April 2004-November 2009 (23 cruises) we recognize a seasonal pattern: sperm whale abundance is highest in the spring and summer cruises and lowest in the fall and winter cruises. Spatially sperm whales are found off the shelf and in deep water areas of the Southern California Bight. Environmental factors, such as sea surface temperature and seasonal fluctuations in prey may be driving these variations.

Temporal Patterns



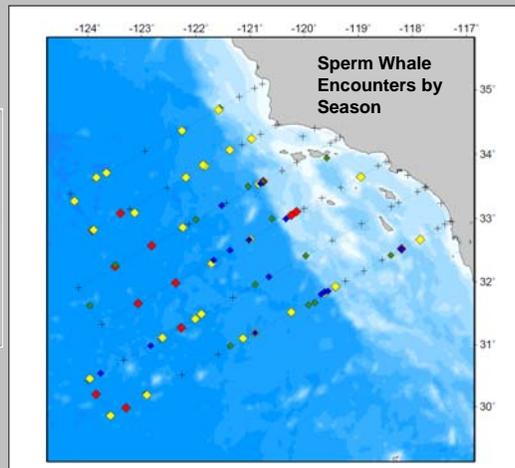
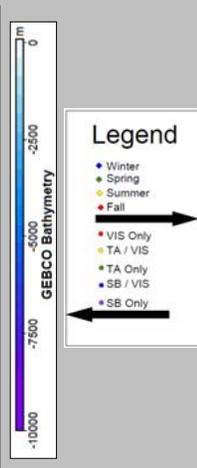
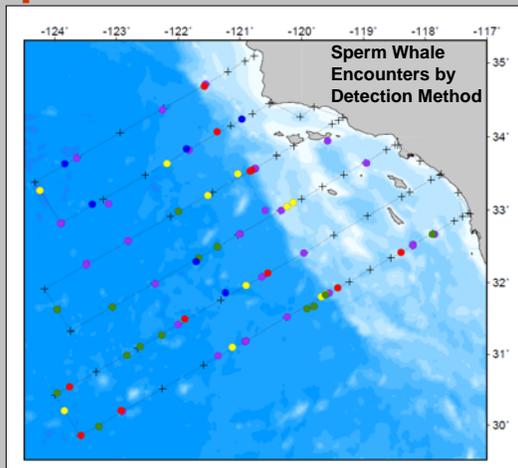
*No Towed array 2004-2005

Results

Sperm whales are:

- Present in the southern CalCOFI region all year
- Most abundant in the summer
- Most commonly detected during sonobuoy deployments
- Not clearly declining or increasing in abundance in this region

Spatial Patterns



Results

Sperm whales are:

- Found throughout southern CalCOFI region
- Generally in deeper waters off the shelf or over basins
- Detected visually and acoustically everywhere

Methods

Data collected during quarterly California Cooperative Oceanic Fisheries Investigations cruises.

Visual Observation: Made by trained observers, during daylight hours

- Beaufort 0-5
- 7 x 50 power binoculars and naked eye
- High power (20 x 50, ship mounted or 20 x 16 handheld) binoculars on some cruises

Acoustic Detection:

Towed Array: multi-element towed array, 192 kHz sampling rate (detections 1-96 kHz), deployed between stations, recording ad hoc or continuously

Sonobuoys: omni and/or difar expendable buoys, 48 kHz sampling rate (detections ~0-24 kHz), deployed ~1nm from station, recording ad hoc or continuously.



Future Work

- Standardize detections by effort
- Estimate group size from acoustics
- Characterize regional demographics
- Improve error with more samples

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