



Sperm whales and seismic  
activities: marine mammal  
observer data from the Gulf of  
Mexico, 2003-2006

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# GOM Region Seismic History

- 2002 Biological Opinion for Lease Sales in the GOM
- Notice to Lessees (NTL 2003-G08) for Implementation of Seismic Survey Mitigation Measures and Protected Species Observer Program
- Updated NTL 2004-G01 issued to include shutdowns for all whales, and all water depths in the Eastern Planning Area
- Updated NTL 2007-G02 – clarifications of existing mitigation requirements

# GOMR Planning Areas





## Gulf of Mexico

- 2003 - 106 G&G permits
- 2004 - 101 G&G permits
- 2005 - 98 G&G permits
- 2006 - 100 G&G permits

# GOM Mitigation Strategy

- ramp-up;
- visual monitoring;
- pre-determined exclusion zone;
- mandatory shut-down of operations;
- reporting requirements;
- encourage PAM

# Ramp-up

- Gradual increase in the sound level to full power
  - Visually monitor the exclusion zone for 30 minutes before ramp-up
  - No ramp-up at night or when you can't monitor the exclusion zone (e.g. fog)
  - Initiated by firing of a single gun, then add guns until array is operation (20-40 minutes)

# Visual monitoring

- Using trained observers to survey the exclusion zone for presence of marine mammals and sea turtles
- Required on all vessels conducting seismic operations in water depths greater than 200 meters throughout the GOM; all water depths east of 88.0 W longitude
- No more than 4 hours consecutive duty allowed; no more than 12 hours in a 24-hour period

# Observer Training

- All observers must complete a protected species observer course
- MMS reviews both course content and trainer qualifications
- Each trainee is provided with a completion certificate
- MMS keeps a database of all trained observers in the GOM



# Exclusion zone

- The area at and below the sea surface within a 500 meter radius of the center of the airgun array
- Each survey vessel must maintain its own unique exclusion zone
- Zone remains fixed in size regardless of water depth or sound source

# Shut-down

- Mandatory shut-down any time a whale enters, or is likely to enter, the exclusion zone
- Vessel operators must comply with all shutdown requests
- A 30-minute all clear before ramp up can begin
- All shut-downs must be reported to MMS within 24 hours

# Reporting requirements

- Reports are submitted to MMS electronically on the 1<sup>st</sup> and 15<sup>th</sup> of each month
  - Survey Report
  - Observer Effort Report
  - Sighting Report

<b>Date:</b>	8/1/07	<b>UTC Time:</b>	17:18-17:26	<b>Project Number:</b>	61180	<b>Sighting Number:</b>	1
<b>Vessel/Rig Name:</b>	Ocean Odyssey		<b>Survey Type:</b>	Surface Seismic			
<b>How did this sighting occur?</b>			<b>Observer(s):</b>				
While on watch for protected species		<input checked="" type="checkbox"/>					
Incidental sighting by you or someone else		<input type="checkbox"/>					
Other (please specify on line below)		<input type="checkbox"/>					
<b>Ship's Position:</b>		Latitude:	27°46.79 N	Block Name:	Green Canyon		
		Longitude:	90°24.38 W	Block Number:	163		
		Bearing:	227°	Water Depth (meters)	889m		
<b>Weather and Watch Conditions:</b>				Visibility (Kilometers)	1-5km		
Swell Height	<1m	Sea State	Slight	% Cloud Cover	100%		
Precipitation	Light rain			Glare- direction / severity:	None		
<b>Species Identification:</b>				<b>Number of Animals:</b>			
Common Name:	Sperm Whale			Total Number:	1		
Scientific Name:	<i>Physeter macrocephalus</i>			Adults:	1		
Certainty of ID:	Definite/Probable/Possible			Juveniles:	0		
<b>Description and distinguishing features:</b> Note size, color & pattern, dorsal placement, size/shape of blow, etc							
Large adult, forward 45° angle blows, squared head, low dorsal hump							
<b>Animal(s) behavior:</b> Include specific details of sighting (blow frequency, swim speed, dive pattern etc)							
One Sperm Whale, <i>Physeter macrocephalus</i> , was initially noted ~1nm off Ocean Odyssey's starboard bow at 17:18. Individual was noted traveling 170° surfacing and blowing frequently. Whale began traveling in a more 80° direction whereupon it entered the exclusion zone. A shutdown of operations occurred at 17:25. One minute later, 17:26, individual was observed to fluke-up approximately 70m off port side; approximately 100m from guns. Whale was not noted to surface again and ramp-up began at 17:56.							
<b>Direction of travel in relation to the vessel:</b>				<b>Activity of Vessel:</b>			
				Underway			
<b>Compass heading of animals:</b>				<b>Airguns firing (when animals first seen) ?</b>			
170°, 80°				Yes / No / Ramp up			
<b>Closest distance of animals to airguns in meters:</b>				<b>Did animal enter the exclusion zone?</b>			
Record even if guns aren't firing or onboard				Yes / No - if yes, for how long? Sperm Whale was noted inside exclusion zone for 2 minutes.			
100m				<b>Were airguns shut down due to this sighting?</b>			
				Yes / No - if yes, for how long?			
<b>Photos or video taken?</b>				Airguns were shutdown for 30 minutes.			
Yes/No- if yes, provide information				<b>Notes or comments:</b>			
See Project Photography Photo One							

# Sighting Report

# Passive Acoustic Monitoring (PAM)

- PAM is not required but is encouraged
- Use of PAM allows for ramp-up in times of reduced visibility (darkness, fog)

# Sperm Whale Sightings 2003-2006

- 2003 – 20 Sightings, 1 shutdown
- 2004 – 75 Sightings, 7 shutdowns
- 2005 – 109 Sightings, 4 shutdowns
- 2006 – 244 Sightings, 24 shutdowns

# Sperm Whale Shutdowns

N=36

- Guns were either at full power (N=26), mitigation gun on (N=9), or ramping up (N=1)
- Mean Group Size 3.9 (range 1-15)
- Average distance to airguns 340 m (range 100-500 m)
- Average water depth 1604 m (range 589-7179 m)

# Sightings with operational guns\*

N=287

- Mean Group Size 3.2 (range 1-18)
- Average distance to airguns 2386 m  
(range 400-25900 m)
- Average water depth 1511 m  
(range 200-3279 m)

\* no shutdowns



# Sightings without airguns

## N=125

- Mean Group Size 2.4 (range 1-10)
- Average distance to airguns 1897 m  
(range 5 - 6300 m)
- Average water depth 1408 m  
(range 461-3297 m)

Thank you.....Questions?

Bill Lang, MMS

