BHI CONSERVANCY

Fostering Community-based Barrier Island Conservation, Preservation & Education

Comments on the Draft Proposed OCS Oil and Gas Leasing Program for 2017-2022 (DPP)

Offshore drilling and the associated risks conflict with the vision of Bald Head Island residents to "live in harmony with nature." As a community-based organization and the environmental conscience of the island, Bald Head Island Conservancy opposes offshore drilling for oil and gas based on scientific evidence of known environmental impacts, potential chronic impacts, and the lack of a known economic benefit.

Seismic Exploration

The environmental impacts of offshore oil and gas exploration begin with seismic testing (Weilgart, 2013). The Bald Head Island Conservancy supports mitigation strategies established by the National Marine Fisheries Service (NMFS) to protect marine mammals (NMFS, 2014) and sea turtles (NMFS, 2007) during seismic exploration. Protection of these important species has been a hallmark of Bald Head Island and represents a significant investment of time and resources by this coastal community. The Bald Head Island Conservancy's Sea Turtle Protection Program has made Bald Head Island an internationally recognized index beach for sea turtle (*Caretta caretta*) nesting. The economic value of this conservation effort is estimated at $30 million annually to the local economy (Delgadillo, 2012). The Bald Head Island Conservancy's 30+ year data set should be used to inform sea turtle mitigation measures for seismic testing. While federal law prohibits drilling within a 50 mile buffer off the coast, some consideration is being given to exploring for resources 5-10 miles closer inshore (Schoof, 2015). Testing closer to the shore will increase the likelihood of interactions with turtles and marine mammals and should be discouraged.

The Bald Head Island Conservancy recommends the Bureau of Ocean and Energy Management (BOEM) eliminate any redundancy of seismic testing proposals if multiple leases are awarded (Figure 1)(BOEM, 2015a). If seismic airguns are used to map fossil fuel deposits offshore of the Mid and South Atlantic states, efficient testing will save time and money, and reduce the impact on endangered animals.

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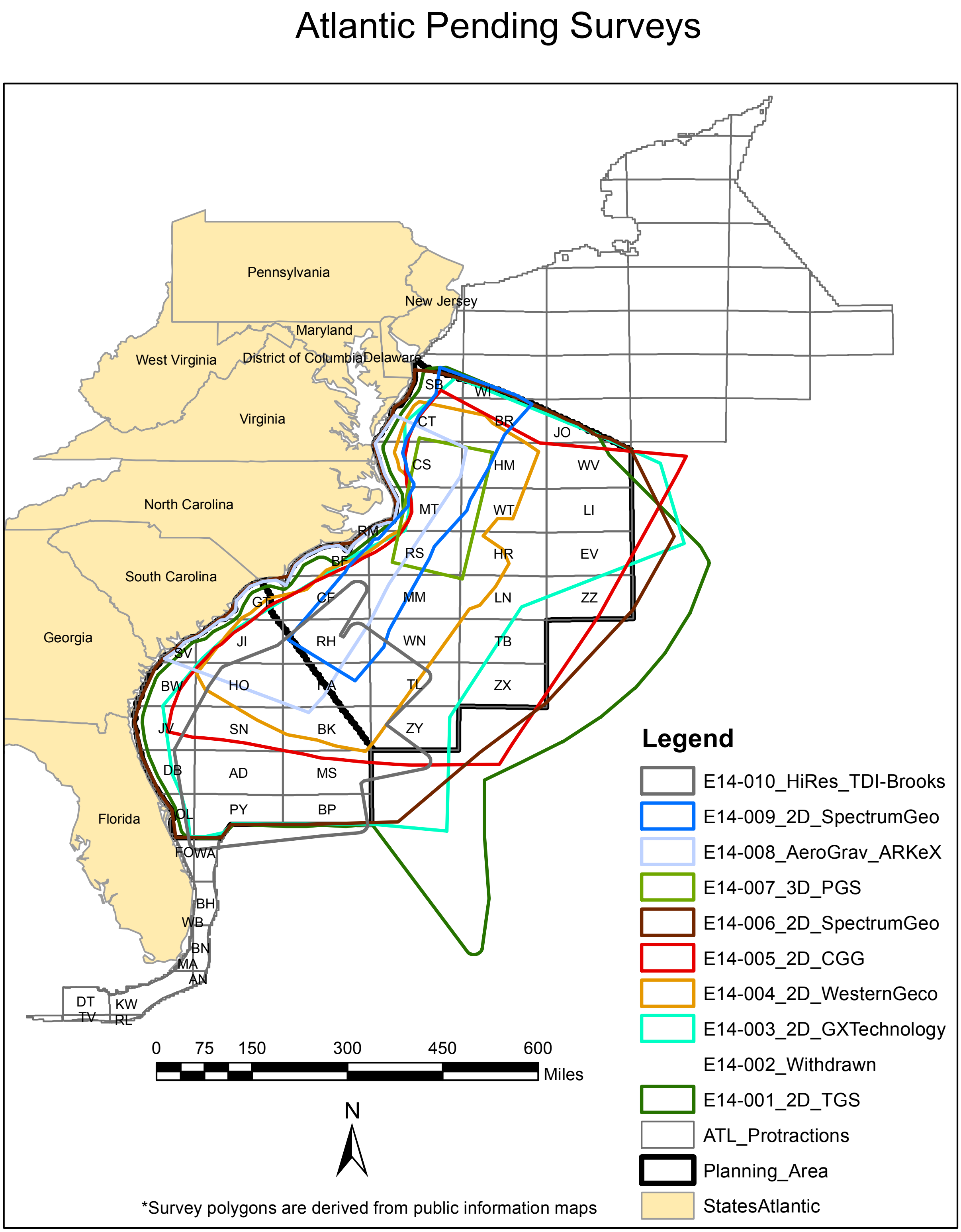


Figure 1. Pending seismic survey permit proposals.

Living in Harmony with Nature

Large Spills

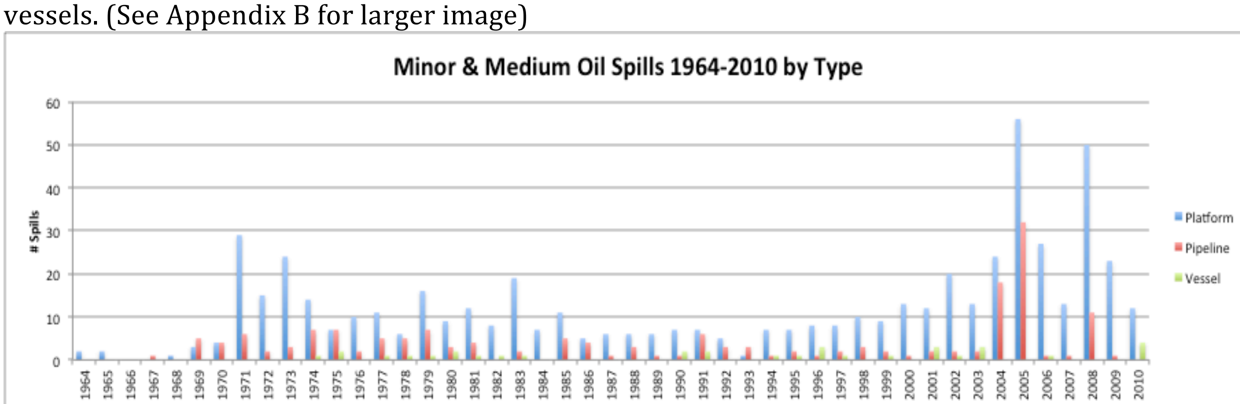
Even with mitigation measures in place, major spills have long-lasting impacts on quality of life, the economy, and wildlife habitats. Large-volume catastrophic oil spills have a low probability for any given year but can have chronic consequences (Appendix A: Summary of studies detailing impacts of oil spills to species and habitats).

Without a good understanding of how oil will disperse within the water column, it is difficult to deploy or develop tools to respond. In the South Atlantic, little information is available about deep and mid-level water transport. One study (Gong et al. 2015) demonstrates that cross shelf water transport occurs annually in Nor'easters in the South Atlantic. If water from the Gulf Stream can be tracked moving from the shelf into near shore environments, then it is likely that oil from a spill can reach as far as estuarine environments in North Carolina. Mitigation tools for spills should include a better understanding of how water moves in the South Atlantic. Additionally, concentrated food in the form of plankton or seaweed correlates with abundance of sea turtles and marine animals; studies should include a better understanding of the distribution of food and habitats for our oceanic resources.

Minor and Medium Spills

Minor and medium volume spills occur annually and have chronic environmental impacts. Lower volume spills occur annually where fossil fuels are harvested. Spills classified as "minor and medium" (1-100,000 gallons) are documented multiple times annually from platforms/rigs, pipelines, and vessels (Figure 2) (BOEM, 2015b)(Larger version Appendix B).

Figure 2. Minor and medium spills (1-100,000 gallons) 1964-2010 from platforms, pipelines, and vessels. (See Appendix B for larger image)



Publically available minor and medium spills data from 2000-2010, show an average of 31 minor or medium spill events per year (BOEM, 2015b). Although mitigation techniques, such as the use of microbes for bioremediation or chemical dispersants, are in place for smaller spills, the use of such approaches has questionable benefits and may cause other unforeseen environmental impacts (Kujawinski, 2011, Mearns, 1990, Dimond, 2010).

While these higher probability, minor to medium spills may be smaller in scope, they present chronic issues for delicate coastal ecosystems (Dvarskas, 2008). Oil from smaller spills accumulates in important sea turtle habitats. Wind and currents can push floating oil in the same way they push floating sargassum seaweed. Sargassum provides shelter and food to adult, juvenile, and hatchling sea turtles (NMFS, 2013). Sargassum is also a feeding and resting area for sea birds (Moser & Lee, 2012). Even in minor to medium volume spills, sensitive animals can experience detrimental impacts from oil in their environment (Read, Ross, Haney Personal Communication March 12, 2015, NOAA, 2015).

If energy harvesting off the South Atlantic occurs, the Bald Head Island Conservancy advocates for mitigation of lower volume, more frequent spills. This mitigation should focus on aggregations like frontal areas and interfaces of major currents. Models for cross shelf transport should also be developed to predict where and when oil from smaller spills could reach shorelines.

Economic Impacts

North Carolina's coastal economy is primarily driven by the tourism industry. A degraded coastal environment from any source threatens this well-established and dependable revenue source. People are drawn to the coast of North Carolina, and particularly Bald Head Island, to enjoy and recreate on pristine beaches, witness and protect nesting sea turtles, and to connect with their families. Sea turtle conservation at the Bald Head Island Conservancy results in over $30 million annually in local revenue (Delgadillo, 2012). Both human and animal beachcombers depend on Bald Head Island's beaches being clean. Tar balls from minor spills or seepage could impact the ability for families to enjoy the beach and deter tourism from the area if tar removal from hands, feet, and bodies becomes a regular part of beach trips (Hanks, 2010). Additionally, seismic testing, drilling activities and pollution could interfere with the ability of sea turtles to nest successfully, which would directly impact the economy of Bald Head Island.

Economic impacts of tourism from the 20 coastal counties (Tourism Economics, 2013) rival the optimistic projections of oil and gas economic benefits in 2035 (Quest Offshore, 2013)(Table 2). Tourism currently funds beach nourishment primarily through room taxes. If tourism revenues are negatively impacted, then funding so desperately needed to protect beaches against storms will also be negatively impacted. Thus a robust economic risk/benefit analysis including these concerns should be included to help states and local communities quantify the risks in the event of large or small impacts from offshore oil and gas extraction.

Table 2. Economic impact of offshore oil and gas exploration by 2035 (Quest Offshore, 2013) and tourism in 20 coastal NC counties (Tourism Economics, 2013)

		Offshore Oil & Gas (by 2035)	Tourism in 20 coastal NC counties (2013)
State of NC	Jobs	55,422	Over 32,190
	Economic Impact	$4.1 billion	$3.03 billion
Brunswick County	Jobs	?	5,030
	Economic Impact	?	$470.6 million

The outlook for the tourism industry is positive, especially with increased population movement towards the North Carolina coasts. In contrast, estimates of potential economic and job growth from offshore energy development in North Carolina are strongly dependent upon two assumptions, first, high oil prices and second, established revenue sharing.

Economic impact estimates from the Quest Offshore report assume oil prices around or above $100 a barrel (Quest, 2013, D. Wakeman personal communication March 12, 2015). Current oil prices in March 2015 are unusually low, at around $55 a barrel, and although oil prices are volatile, the assumptions used in the economic projections by Quest Offshore may be overly optimistic (Bloomberg, 2015). The second assumption of established revenue sharing between states and the federal government is not a reality at this time. Furthermore, if North Carolina receives a 37.5% revenue share, as Table 2 data assumes, there are no state policies that would ensure the revenues would be used for mitigation and shoreline protection.

Protecting Our Communities

Oil and gas leasing in the Atlantic puts at risk unique and sensitive environmental resources. These resources are an integral part of Bald Head Island's economy and are valued by the Bald Head Island community as demonstrated by the vision to live in harmony with nature and ongoing support of the Bald Head Island Conservancy. The threat from offshore oil and gas extraction extends beyond state lines, and a potential lease in South Carolina or Georgia poses a great hazard to the North Carolina coast, which should be strongly considered in the permitting process.

While the Bald Head Island Conservancy opposes offshore drilling, it recognizes that its perspective, based on its mission, is heavily focused on the environmental impacts to the Bald Head Island community. Other non-environmental concerns, like energy security and federal and state revenue needs, could propel voters to support offshore energy development despite the known and unknown environmental and economic impact to

North Carolina. Thus, the Bald Head Island Conservancy submits the following eight recommendations to BOEM as the process moves forward:

1. Reduce the impact of seismic testing, by having only one seismic test for any location at a time.
2. To plan for and respond to spills, collect data concerning cross shelf oceanographic transport in addition to oceanographic aggregation systems, used by sea turtles, marine mammals, seabirds and fishes.
3. Use Bald Head Island Conservancy's environmental and economic data about sea turtle conservation to inform mitigation strategies.
4. Develop and employ mitigation strategies for lower volume, higher frequency spills.
5. Clarify assumptions relating to oil/gas prices and revenue sharing and compare the results to similar projections about revenue from tourism and fisheries.
6. Quantify all the economic risks associated with reduction of tourism-based economies, especially those risks related to coastal shoreline protection projects.
7. Finalize and implement federal/state revenue sharing policies before exploration begins.
8. Direct all royalties from revenue sharing to mitigation and shoreline protection.

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Appendix A:

The information contained in the table is a review of literature regarding the impacts of spills on wildlife known to utilize BHI habitats and similar nearshore coastal environments. The information summarized reviews impacts, both positive and negative, seen from: Exxon Valdez, Deepwater Horizon, and smaller oil spills or experimental studies.

Spill	Species	Impact
Exxon-Valdez (1989)	Sea Otters	• As of 2000, populations numbers had not recovered from the spill, lower rate of recovery was found in areas with higher oil exposure (Bodkin et al. 2002) • A biomarker for hydrocarbons was found in individuals (Bodkin et al. 2002) • Reproduction was not affected (Bodkin et al. 2002)
	Shorebirds	• Some species did not show evidence of recovery until almost 7 years after the spill (Wiens et al. 2001) • Black Oystercatcher chicks raised on heavily oiled shorelines gained less mass than those raised on less oiled shorelines (Andres 1999) • Reproduction and breeding success not affected (Andres 1999) • Harlequin duck not fully recovered in oiled areas 10 years after spill (Bodkin et al. 2003)
	Fish	• Wild pink salmon populations took 10 years to recover (Carls et al. 2003) • Hydrocarbons from oil spills negatively affect salmon eggs (Carls et al. 2003) • Herring larvae hatched from eggs collected on oiled beaches showed deformities and abnormalities (Hose et al. 1996)
	Bald Eagle	• Significant drop in population numbers and reproduction reduced following spill (Bowman 1993) • It took six years for the Prince William Sound population to reach pre-spill numbers (Bowman et al. 1997)
	Flora	• Six years after spill, 80% of eelgrass beds still showed no recovery (Dean & Jewett 2001) • Most kelp beds recovered within two years (Dean & Jewett 2001) • Oil coverage and oil removal efforts killed the majority of brown algae on shores (De Vogelaere & Foster 1994) • 1.5 years after the spill, brown algae covered 80% of sample area on unoiled beaches, but only 1% on oiled

		beaches (De Vogelaere & Foster 1994)
	Habitat	• Oil present until 1993 (Andres 1999) • One of six streams tested still showed levels of hydrocarbons in 1999 (Carls 2003) • Twelve years after spill, oil was still found either on the surface and in the subsurface of 78 out of 91 beaches observed (Short et al. 2004) • Oil more persistent than anticipated (Bodkin et al. 2003)
Deepwater-Horizon (2010)	Sea Turtles	• *Sargassum* algae, a common habitat for hatchlings, was weighted down and sunk by applied oil dispersant, eliminating that habitat (Powers et al. 2013) • Oil coated *Sargassum* algae and exposed hatchlings (among other animals) to high levels of contamination (Powers et al. 2013)
	Turtles	• All Diamondback Terrapins found at one sampling site were dead from heavy oil levels (Drabeck et al. 2014) • Blood contaminant levels were generally higher in Diamondback Terrapins in areas with more oil (Drabeck et al. 2014)
	Shorebirds	• Between 40 and 140 days after the spill, the average number of dead birds surveyed was more than twice the number of live birds (Belanger 2010) • 110 days after the spill, there was a significant increase in the number of dead birds collected, suggesting environmental impact from the spill (Belanger 2010) • Between 2010 and 2013, laughing gull counts were down by almost 60% (Haney et al. 2014) • 32% of laughing gull, 15% of royal tern, 8% of northern gannet, and 12% of brown pelican populations were killed in spill (Haney et al. 2014)
	Flora	• Heavy oil caused plant mortality and increase erosion in salt marshes (Silliman et al. 2012) • Marsh grasses were mostly recovered after 18 months (Silliman et al. 2012) • Oil dispersant caused Sargassum alga to sink, spreading oil and chemicals vertically through the water column (Powers et al. 2013) • Oil dispersant and oil caused low dissolved oxygen levels in *Sargassum* drifts (Powers et al. 2013)
	Habitat	• Oil present until 1993 (Andres 1999)

		• One of six streams tested still showed levels of hydrocarbons in 1999 (Carls 2003) • Twelve years after spill, oil was still found either on the surface and in the subsurface of 78 out of 91 beaches observed (Short et al. 2004) • Oil more persistent than anticipated (Bodkin et al. 2003)
General	Sea Otters	• Oil on the fur almost doubles thermal conductance, resulting in otters using excess energy shivering in order to keep warm (Davis et al. 1988)
	Sea Turtles	• Oil droplets interfere with ability to insulate and lead to hypothermia (Jernelov 2010)
	Shorebirds	• Oil droplets interfere with ability to insulate and lead to hypothermia (Jernelov 2010) • Lights from drilling operations could affect and disorient birds (Lee 1999)
	Flora	• In the case of a light oil spill, it could take two years for vegetation to grow back (Bjerstedt, 2011) • Smooth cordgrass was not affected by crude oil until after 3 months, when photosynthesis began to decrease significantly (Ling & Mendelssohn 1996)
	Habitat	• Beaches with fine grain sand can be cleaned relatively easily with road graders and other heavy equipment (Gundlach 2006) • Marshes are one of the most sensitive ecosystems to oil spills, because of the persistence of oil years after a spill (Gundlach 2006) • In Patagonia, Chile, oil still remains in a salt marsh 21 years after a spill (Gundlach 2006)

Appendix B

Figure 2. Minor and medium oil spills recorded annually in the United States from platforms, pipelines, and vessels.