

RESOLUTION NO. 2933

A RESOLUTION OF THE CITY OF SALISBURY, MARYLAND IN OPPOSITION TO OFFSHORE SEISMIC TESTING AND DRILLING FOR OIL AND GAS.

WHEREAS, the City of Salisbury, Maryland was designated a Sustainable Maryland community in 2016; and

WHEREAS, scientific study has proven that seismic air gun blasting, to explore for oil and gas deposits, disrupts and displaces marine life and threatens our coastal wetlands in Maryland, which are of intrinsic ecological value for numerous diverse species, serve as essential nursery habitats for recreational and commercially important fisheries, and act as natural buffers from storm surges and hurricanes; and

WHEREAS, offshore oil and gas drilling and exploration places coastal communities at economic and ecological risk from oil spills and the pollution brought by routine drilling operations and on shore industrialization, threatening the livelihoods of commercial and recreational fisherman and small businesses that rely on a clean and healthy ocean and beaches for a thriving tourism industry; and

WHEREAS, offshore drilling may require significant onshore infrastructure, such as pipelines and refineries, which would harm the character of Maryland's coastline, perpetuate our ties to carbon pollution, and exacerbate wetland loss, storm surge, and sea level rise impacts; and

WHEREAS, tourism that is related to the appreciation of our natural coastline and historical environment is a major economic force in the region; and

WHEREAS, the City of Salisbury, Maryland endeavors to be a good steward of the State's environment and its resources.

NOW, THEREFORE, BE IT RESOLVED BY THE SALISBURY CITY COUNCIL that the City opposes offshore oil and gas drilling, and exploration activities, including air gun blasting, in the mid-Atlantic Ocean adjacent to Maryland's coastline.

AND BE IT FURTHER RESOLVED BY THE SALISBURY CITY COUNCIL that a copy of this Resolution be sent to the Governor, Maryland's 1st Congressional District House and Senate Delegations to the 116th Congress, the President of the Maryland Senate, and the Maryland House Speaker.

THE ABOVE RESOLUTION was introduced, read and passed at the regular meeting of the Council of the City of Salisbury held on this 8th day of April 2019 and is to become effective immediately upon adoption.

ATTEST:

Kimberly R. Nichols
Kimberly R. Nichols, City Clerk

John R. Heath
John R. Heath, President
Salisbury City Council

Muir Boda
Muir Boda, Vice-President
Salisbury City Council

Angela Blake
Angela M. Blake, Council Member
Salisbury City Council

James P. Ireton Jr.
James P. Ireton, Council Member
Salisbury City Council

April Jackson
April Jackson, Council Member
Salisbury City Council

APPROVED BY ME THIS:

15th day of APRIL 2019

Jacob R. Day
Jacob R. Day, Mayor



City of
Salisbury
Jacob R. Day, Mayor

To: Julia Glanz, City Administrator
From: Amanda H. Pollack, P.E., Director of Infrastructure & Development **AR**
Date: March 21, 2019
Re: Resolution – Opposition of Seismic Testing and Offshore Drilling

The Department of Infrastructure & Development provides staff support for the Sustainability Advisory Committee (also known as the "Green Team"). In December 2018, the Committee heard a presentation by Oceana regarding offshore drilling and seismic testing. Since that time, a subcommittee has worked on a resolution in opposition to offshore drilling and seismic testing. At the meeting held on March 6, 2019, the Sustainability Advisory Committee passed a motion unanimously to support the resolution and to forward the resolution to the Mayor and City Council. Attached are supporting documentations.

Unless you or the Mayor have further questions, please forward a copy of this memo and the resolution to the City Council. Members of the Sustainability Advisory Committee will be present at the Council meeting to answer questions.

East Coast opposition

More than 330 municipalities and over 2,100 elected local, state and federal officials have formally opposed offshore oil and gas drilling and seismic airgun blasting, including over 240 along the Atlantic Coast. Numerous fishing and tourism interests, including local chambers of commerce, tourism and restaurant associations, and an alliance representing over 46,000 businesses and 500,000 commercial fishing families from Florida to Maine, also oppose oil exploration and development in the Atlantic.

Additionally, the New England, South Atlantic and Mid-Atlantic Fishery Management Councils, the Department of Defense, NASA, and the Florida Defense Support Task Force have all expressed concerns about the compatibility of their activities with offshore oil and gas operations.

Nationwide opposition to offshore oil and gas drilling has been mounting for years. These dirty and dangerous drilling proposals put at risk over [1.5 million East Coast jobs and nearly \\$108 billion](#) in gross domestic product (GDP) that rely on healthy ocean ecosystems and a clean marine environment. [In Maryland alone](#), over 96,000 jobs and roughly \$6 billion in GDP depend on healthy ocean resources, mainly through tourism, fishing and recreation.

For more information, please visit: stopthedrill.org

Maryland municipalities and counties opposing seismic blasting and/or offshore drilling

1. [Annapolis](#)
2. [Baltimore](#)
3. [Berlin](#)
4. [Crisfield](#)
5. [Montgomery County](#)
6. [Ocean City](#)
7. [St. Mary's County](#)
8. [Worcester County](#)

Opposition from Maryland business interests

- [Ocean Pines Chamber of Commerce](#): Put out statement opposing any form of seismic testing in offshore waters 1/15/2019
- [Business Alliance for Protecting the Atlantic Coast](#): Sent [letter](#) to Interior Secretary Zinke on behalf of more than 41,000 businesses and 500,200 commercial fishing families, urging them not to reconsider the 2017-2022 plan, and opposing offshore drilling and seismic blasting 4/28/17
- [Business Alliance for Protecting the Atlantic Coast](#): Sent [letter](#) to President Obama on behalf of more than 35,000 businesses and 500,200 commercial fishing families from Maine to Florida, urging him to permanently protect the Atlantic from offshore oil and gas drilling, and to deny all Atlantic seismic airgun blasting permits 12/13/2016 (offshore drilling and seismic blasting)
- [Greater Ocean City, MD Chamber of Commerce](#): Sent letter to President Obama 12/13/2016 (offshore drilling and seismic blasting)
- [66 East Coast businesses](#): Signed letter to President Obama 12/12/2016 (offshore drilling)
- [Business Alliance for Protecting the Atlantic Coast](#): Sent [letter](#) to President Obama on behalf of more than 12,000 businesses and 400,000 commercial fishing families 10/27/2016 (offshore drilling and seismic blasting)
- [Ocean City, MD Hotel-Motel-Restaurant Association](#): Sent letter to BOEM 2/29/2016 (offshore drilling and seismic blasting)

- [360+ East Coast Businesses](#): Signed letter to President Obama 2/16/2016 (offshore drilling)
- [280 East Coast Businesses](#): Signed letter to President Obama 2/3/2016 (offshore drilling and seismic blasting)
- [Ocean City, MD Chamber of Commerce](#): Sent letter to Governor Hogan 1/25/2016 (offshore drilling and seismic blasting)

National security stakeholders

- [DoD Report on Preserving Military Readiness in the Eastern Gulf of Mexico](#): Outlines the negative impact offshore drilling in the Eastern Gulf of Mexico would have on military readiness activities. (05/11/2018)
- [Hampton Roads Military and Federal Facilities Alliance](#): sent letter to Secretary Zinke strongly opposing any offshore drilling activities that could jeopardize the military's ability to conduct operations and training off the coast of Virginia 1/29/2018 (offshore drilling)
- [U.S. Airforce](#): Sent letter to Senator Nelson 6/27/2017 (offshore drilling)
- [Office of the Under Secretary of Defense](#): Responded to a letter from U.S. Representative Gaetz (R-FL) stating that "the DoD cannot overstate the vital importance of maintaining [the Eastern Gulf of Mexico offshore oil and gas] moratorium" (4/26/17)
- [Florida Defense Support Task Force White Paper - Oil Drilling & Military Mission Compatibility](#): Recommended that Florida maintain a united front in supporting an extension of the current moratorium on drilling in the Gulf of Mexico east of the Military Mission Line 1/31/17
- [DoD Mission Compatibility Planning Assessment - BOEM 2017-2022 Outer Continental Shelf \(OCS\) Oil and Gas Leasing Draft Proposed Program](#): Outlined the large conflicting national security and current military operational uses in the U.S. OCS, especially the Atlantic Ocean, with permanent and temporary oil and gas structures 10/30/15
- [The National Aeronautics and Space Administration \(NASA\) commented on the 2017-2022 Five-Year Plan Request for Information](#): Expressed continued concern regarding the potential impacts that oil and gas development of the coast of Virginia would have on the operation at Wallops Flight Facility 8/2014
- [Defense Secretary Rumsfeld](#): Sent a letter to Chairman Warner stating that offshore oil and gas activities within the Gulf of Mexico Military Mission Line would be incompatible with military activities 11/30/05

Opposition from fishing interests in the Mid-Atlantic region of the United States

- [New England Fishery Management Council](#) (6/29/2017), [Mid-Atlantic Fishery Management Council](#) (4/25/2017) and [South Atlantic Fishery Management Council](#) (4/25/2017): All sent letters to Interior Secretary Zinke expressing concerns with the risks posed by seismic surveys and oil and gas development to managed resources, fisheries and coastal communities along the Atlantic coast.
- [Mid-Atlantic Fishery Management Council](#): Sent a letter to Interior Secretary Zinke expressing concerns with the risks posed by seismic surveys and oil and gas development to managed resources, fisheries and coastal communities along the Atlantic coast 4/25/17
- [Maryland Saltwater Sportfishing Association](#): Sent letter to President opposing offshore oil exploration and development in the Atlantic 11/10/2016 (offshore drilling and seismic blasting)

- [Snook and Gamefish Foundation](#): Sent letter to BOEM opposing offshore oil exploration in the Atlantic 8/30/2016 (seismic blasting)
- [36 commercial and recreational fishing interests in the Mid-Atlantic](#): Sent letter to the governors of Delaware, Maryland and Virginia, expressing their concerns with offshore drilling and proposed seismic airgun blasting 3/29/2016 (offshore drilling and seismic blasting)
- [Mid-Atlantic Fishery Management Council](#): Updated and strengthened its policies to increase protection for fisheries and fish habitat from energy exploration and development activities for the species and areas the Council is charged with managing 2/17/2016 ([Read the full policy](#))
- [Fisheries Survival Fund](#): Sent letter to the Mid-Atlantic Fishery Management Council expressing concern 8/7/2015 (offshore drilling and seismic blasting)
- [Billfish Foundation](#): Sent letter to BOEM 5/7/2014 (seismic blasting)
- [Mid-Atlantic Fishery Management Council](#): Sent letter to BOEM 5/2/2014 (seismic blasting)
- [International Game Fish Association](#): Sent letter to BOEM 5/1/2014 (seismic blasting)

Opposition from Maryland elected officials and key stakeholders

- [9 Attorneys General](#): Lead by Attorney General Frosh (MD), they announced on 12/20/2018 that they will be intervening in the lawsuit to stop the proposed use of air guns to survey the Atlantic Ocean floor for oil and gas. Attorneys General from Delaware, New York, North Carolina, Virginia, Massachusetts, New Jersey, Connecticut, and Maine joined the suit.
- [The Mid-Atlantic Regional Council on the Ocean](#): sent a letter to NOAA opposing offshore drilling and the issuance of permits for seismic airgun blasting 12/20/2018.
- [10 Atlantic State Governors](#): sent a letter to Secretaries Ross and Zinke to express their opposition to seismic airgun surveys and oil and gas drilling off the coast. They urged the Department of the Interior to deny permits for seismic airgun surveys in the Atlantic. 12/20/2018
- [227 state legislators representing 17 coastal states](#): Sent letter to Secretary Zinke opposing the Draft Proposed Program 3/5/2018
- [Maryland Governor Hogan and North Carolina Governor Cooper](#): Published joint op-ed demonstrating strong bipartisan opposition to Trump's offshore drilling plan 2/2/2018 (offshore drilling)
- [7 East Coast Governors](#): sent letter to Secretary Zinke expressing joint opposition to the inclusion of the Atlantic Ocean in the proposed 2019-2024 Outer Continental Shelf Oil and Gas Leasing Program 1/17/2018 (offshore drilling)
- [7 East Coast Governors, including Maryland Governor Hogan](#): Sent letter to Secretary Zinke expressing joint opposition to the inclusion of the Atlantic Ocean in the proposed 2019-2024 Outer Continental Shelf Oil and Gas Leasing Program 1/17/18 (offshore drilling)
- [Maryland Attorney General Brian Frosh](#): Submitted RFI comments strongly opposing any efforts to open up the Mid-Atlantic OCS lease area to oil and gas exploration and drilling 8/17/2017
- [The Maryland Department of Natural Resources](#): Submitted RFI comments on behalf of the Hogan Administration opposing offshore oil and gas drilling and expressing serious concerns about seismic surveys and testing in the Atlantic Ocean 8/16/2017
- [Maryland Governor Larry Hogan](#): Sent letter to BOEM 8/16/2017 (offshore drilling); [letter of concern to NOAA](#) 7/6/2017 (seismic blasting)

- [Attorneys General of Maryland, Connecticut, Delaware, the District of Columbia, Massachusetts, New York, North Carolina, Pennsylvania, and Rhode Island](#): sent [letter to NOAA](#) 7/21/2017 (seismic blasting)
- [Assateague Coastal Trust, MD](#): Sent letter to President Obama 11/15/2016 (offshore drilling and seismic blasting)
- [42 state and local elected officials from Maryland led by Senator Raskin, Delegate Lierman and Council Member Hucker](#): Sent letter to DOI 8/2/2016 (seismic blasting)
- [70 State Legislators led by Representatives Harrison and Jones, and Senators Campsen and Jackson](#): Sent letter to DOI 7/26/2016 (seismic blasting)
- [83 East Coast State Legislators, led by State Representative Pricey Harrison](#): Sent letter to BOEM 3/30/2015 (offshore drilling)
- [Maryland Attorney General Brian Frosh](#): Sent letter to BOEM 3/30/2015 (offshore drilling and seismic blasting)
- [95 state and local elected officials](#): Submitted letter to President Obama opposing seismic blasting on 5/6/2014 (seismic blasting)
- [Maryland \(Former\) Governor Martin O'Malley](#): Sent letter to DOI 2/26/2014 (offshore drilling); [Wrote an op-ed](#) in the New York Times 2/2/2015 (offshore drilling)

Congressional letters of opposition with Maryland members

- [23 Senators](#): sent a letter, led by Senator Markey (D-MA), to Secretaries Ross and Zinke to express opposition to the issuance of five incidental harassment authorization (IHA) permits that would allow companies to conduct seismic airgun blasting surveys along the Atlantic coast.
- [93 U.S. Representatives](#): sent a bipartisan letter led by Congressman Rutherford (R-FL) to Interior Secretary Ryan Zinke and Commerce Secretary Wilbur Ross expressing strong opposition to the issuance of 5 Incidental Harassment Authorization (IHA) permits to companies planning to conduct seismic airgun blasting surveys along the Atlantic coast 12/6/2018.
- [Maryland Delegation led by Senator Cardin](#): Sent a bipartisan letter to Secretary Zinke and Dr. Cruickshank strongly opposing the Draft Proposed Program 2/27/2018
- [Maryland House Democrats](#): Sent letter to Maryland Governor Hogan urging him to ask Interior Secretary Ryan Zinke to remove MD from the Draft Proposed Program 1/19/18 (offshore drilling)
- [U.S. Senators Cardin and Van Hollen](#): Sent a letter to MD Governor Hogan urging him to request a Coastal Zone Management Act consultation for new seismic airgun blasting permit applications off the coast of Maryland 6/30/2017
- [103 U.S. Representatives led by Reps. Rutherford \(R-FL\) & Beyer \(D-VA\)](#): Sent a bipartisan letter to Interior Secretary Zinke urging him not to authorize Incidental Harassment Authorizations (IHAs) and deny pending seismic airgun blasting permits in the Atlantic 6/28/2017
- [14 U.S. Senators led by Sen. Nelson \(D-FL\)](#): Sent a letter to Commerce Secretary Ross opposing the issuance of Incidental Harassment Authorizations (IHAs) for Atlantic offshore oil and gas exploration, including seismic airgun blasting; and requested the agency extend the public comment period, and hold field hearings 6/9/2017
- [107 U.S. Representatives led by Reps. LoBiondo \(R-NJ\), & Lowenthal \(D-CA\)](#): Sent a bipartisan letter to Interior Secretary Zinke urging him not to include the Atlantic and Pacific Oceans in the new OCS Five-Year Plan as re-initiated by President Trump's Executive Order 5/11/2017

- [14 U.S. Senators](#): Sent letter asking President Obama to permanently protect the Atlantic and Arctic Oceans from any future offshore oil and gas leasing 10/6/2016 (offshore drilling)
- [74 U.S. Representatives](#): Sent bipartisan letter asking President Obama to permanently protect the Atlantic and Arctic Oceans from any future offshore oil and gas leasing 9/28/2016 (offshore drilling)
- [U.S. Representatives Sanford \(SC-1\) and Connolly \(VA-11\)](#): Sent bipartisan letter with 53 colleagues urging President Obama to halt consideration of G&G permits in the Atlantic 6/8/2016 (seismic blasting)
- [U.S. Representative Seth Moulton \(D-MA\)](#): Sent a letter with 28 colleagues to Secretary of State John Kerry expressing serious concern over offshore oil and gas exploration and development in Nova Scotia waters tangential to critical U.S. fishing waters 5/19/2016 (offshore drilling and seismic blasting)
- [18 U.S. Senators](#): Sent letter to President Obama urging the administration to refrain from permitting seismic blasting in the Atlantic 4/28/2016
- [51 U.S. Representatives](#): Sent letter to President Obama thanking the administration for removing the Atlantic from consideration in the five-year plan 4/25/2016 (offshore drilling)
- [36 U.S. Representatives](#): Sent bipartisan letter to DOI asking to remove the Atlantic Ocean from the next five-year plan 2/11/2016 (offshore drilling)
- [10 U.S. Senators](#): Sent a letter to DOI asking not to issue any new leases in federal waters 2/3/2016 (offshore drilling)
- [U.S. Representatives Scott \(VA-3\) and Sanford \(SC-1\)](#): Sent bipartisan letter with 31 colleagues to BOEM asking to halt seismic testing in the Atlantic 12/14/2015 (seismic blasting)
- [53 U.S. Representatives](#): Sent letter to DOI 3/9/2015 (offshore drilling)
- [12 U.S. Senators](#): Sent letter to DOI 3/9/2015 (offshore drilling)
- [8 members of Maryland's congressional delegation](#): Sent letter to President Obama opposing seismic testing 7/31/2014
- [9 U.S. Senators](#): Sent letter to DOI requesting that the seismic airgun PEIS not be released without incorporation of the "best available science" 2/26/2014
- [8 U.S. Senators](#): Sent letter to President Obama opposing seismic testing 1/30/2013

National security stakeholders

- [U.S. Airforce](#): Sent letter to Senator Nelson 6/27/2017 (offshore drilling)
- [Office of the Under Secretary of Defense](#): Responded to a letter from U.S. Representative Gaetz (R-FL) stating that "the DoD cannot overstate the vital importance of maintaining [the Eastern Gulf of Mexico offshore oil and gas] moratorium" (4/26/17)
- [Florida Defense Support Task Force White Paper - Oil Drilling & Military Mission Compatibility](#): Recommended that Florida maintain a united front in supporting an extension of the current moratorium on drilling in the Gulf of Mexico east of the Military Mission Line 1/31/17
- [DoD Mission Compatibility Planning Assessment - BOEM 2017-2022 Outer Continental Shelf \(OCS\) Oil and Gas Leasing Draft Proposed Program](#): Outlined the large conflicting national security and current military operational uses in the U.S. OCS, especially the Atlantic Ocean, with permanent and temporary oil and gas structures 10/30/15
- [The National Aeronautics and Space Administration \(NASA\) commented on the 2017-2022 Five-Year Plan Request for Information](#): Expressed continued concern regarding the potential

impacts that oil and gas development of the coast of Virginia would have on the operation at Wallops Flight Facility 8/2014

- [Defense Secretary Rumsfeld](#): Sent a letter to Chairman Warner stating that offshore oil and gas activities within the Gulf of Mexico Military Mission Line would be incompatible with military activities 11/30/05

Editorials in Maryland

- *Baltimore Sun*: [Offshore drilling is a loser](#)
- *Baltimore Sun*: [Offshore Drilling- All Risk, No Reward](#)
- *Cecil Whig*: [Seismic testing off coast ill-advised](#)
- *Delmarva Now*: [Our view: Imposing offshore drilling on unwilling states a recipe for disaster](#)

Opposition from scientists and advocacy groups

- [225 Nonprofit Organizations and Businesses](#): Sent letter to the U.S. House of Representatives opposing the pro-offshore drilling "ASTRO" Act 11/7/2017
- [66 Nonprofit Organizations](#): Sent letter to U.S. House of Representatives opposing the pro-offshore drilling "SECURE" Act 11/7/2017
- [67 Non-Profit Organizations](#): Sent letter to NOAA 7/21/2017 (seismic blasting)
- [60+ local groups](#): Sent letter to Rep. Mark Sanford (R-SC) in support of [H.R. 2252](#), a bill that would establish a 10-year moratorium on offshore oil and gas drilling and seismic airgun blasting in the Atlantic, Straits of Florida, and Eastern Gulf of Mexico 6/8/2017 (offshore drilling and seismic blasting)
- [38 diverse community groups](#): Sent letter to DOI 5/24/17 (offshore drilling and seismic blasting)
- [50+ conservation and animal rights groups](#): Sent letter led by the Waterkeeper Alliance to President Obama urging him to permanently protect unleased U.S. waters from offshore drilling 12/13/2016 (offshore drilling)
- [Members of the Green Group](#): Sent letter to the U.S. Senate urging them to vote down Senate Bill 3110 sponsored by Senators Vitter and Cassidy 7/5/2016 (offshore drilling)
- [30+ conservation and animal rights groups](#): Sent letter to BOEM urging them to redo or supplement the environmental impact statement for offshore oil and gas exploration in the Atlantic 5/26/2016 (seismic blasting)
- [60+ conservation and animal rights groups](#): Sent letter to BOEM urging them to deny pending permits for seismic blasting now that the Atlantic has been removed from the 5-year plan 4/28/2016 (seismic blasting)
- [28 leading marine biologists with specific expertise on the North Atlantic right whale](#): Submitted letter to President Obama to halt the permitting of oil and gas seismic surveys off the East Coast 4/14/2016 (seismic blasting)
- [48 state/regional conservation and civic groups](#): Sent letter to BOEM supporting their decision to remove the Atlantic from consideration for offshore drilling 4/11/2016 (offshore drilling)
- [75 Leading marine scientists](#): Sent letter to the President urging him "to reject the Interior Department's analysis and its decision to introduce seismic oil and gas surveys in the Atlantic," 3/5/2015 (seismic blasting)
- [163 conservation and animal rights groups](#): Submitted letter to President Obama opposing seismic blasting on 5/6/2014 (seismic blasting)

- 100+ scientists: Sent letter to President Obama urging him to "wait on new science before permitting the use of seismic airguns in the Atlantic Ocean" 2/20/2014 (seismic blasting)

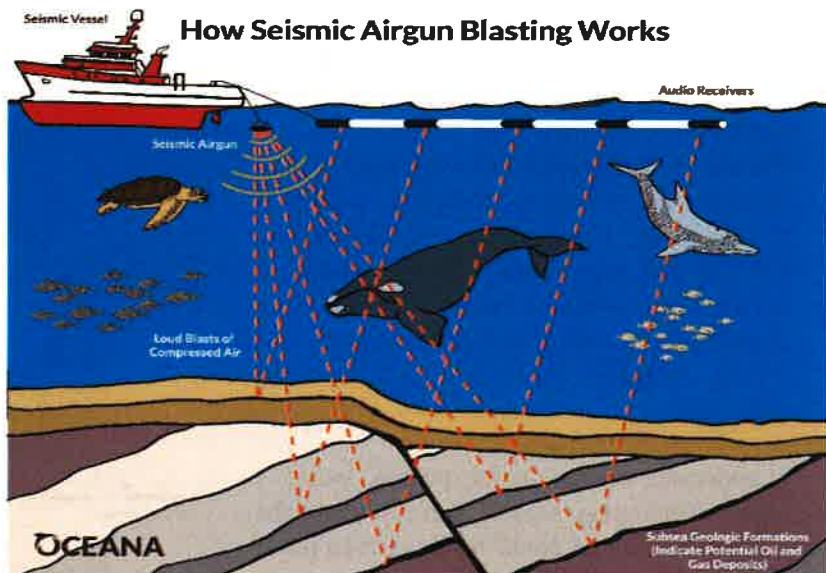


Offshore Oil & Gas Exploration: Seismic Airgun Blasting

Seismic airgun blasting is a process used to search for and map oil and gas deposits deep below the seafloor. A typical seismic survey involves a ship traveling across the ocean in successive parallel lines while towing one or more seismic airgun arrays. These airguns create one of the loudest sources of noise in the oceans, behind explosives for military testing and shipping.¹

How does seismic airgun blasting work?

Seismic airguns release pressurized air blasts to create powerful sound waves that travel through the water column² and seabed, and provide information about the seafloor.³ These sound waves travel as echoes back to the surface, where they are captured by audio monitors called hydrophones.⁴



Seismic airgun blasting characteristics:

- Loud blasts repeated every 10-12 seconds⁵ for days, weeks, or months at a time.⁶
- 12-48 individual airguns are towed in each array; a single ship can tow up to 96 airguns.⁷
- The surface area covered by the largest seismic array was 21 times larger than the National Mall in Washington, D.C.⁸
- Seismic airgun sounds can be heard up to 2,500 miles from the source under some conditions, approximately the distance of a flight from New York to Los Angeles.⁹

Why is seismic airgun blasting a problem?

Not only is seismic airgun blasting the first step toward dirty and dangerous offshore drilling, but the process itself is harmful to marine life. Seismic airguns produce repetitive, explosive sounds that can travel over large distances.¹⁰ Because sound travels so efficiently underwater, airgun blasts can be heard far from their sources.¹¹ As the sound waves from the individual seismic blasts move away from the airguns, they merge into continuous noise pollution that drowns out other sounds in the ocean.

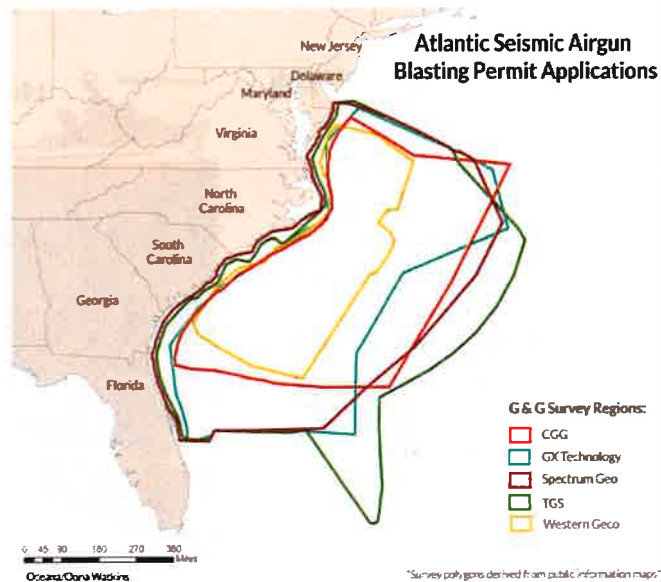


Where is seismic airgun blasting being considered?

On April 28, 2017, President Trump signed Executive Order 13797 aimed at expanding offshore drilling and exploration in U.S. waters.¹² The order calls for a review of the current Five-Year Outer Continental Shelf (OCS) Oil and Gas Leasing Program (for 2017-2022) and directs the responsible agencies to fast-track the permitting process for seismic airgun blasting.

Following that directive, the Department of the Interior reversed a decision made in January 2017 to deny seismic airgun blasting permits in an area twice the size of California, stretching from Delaware to Florida.¹³ The Bureau of Ocean Energy Management is now reconsidering issuing those permits. Concurrently, the National Oceanic and Atmospheric Administration resumed evaluation of incidental take authorizations that would grant seismic survey companies permission to harm marine mammals.

If approved, seismic airgun permits would allow overlapping seismic surveys along the Atlantic coast that could result in even more severe impacts to marine life.



Permits for Atlantic seismic surveys being reviewed by BOEM.

Biological impacts of seismic airgun blasting: Overview

Seismic airgun noise can have significant and wide-ranging impacts on fish, shellfish, whales and sea turtles. According to the government's own estimates, seismic airgun blasting in the Atlantic could harm or harass marine mammals like dolphins and whales hundreds of thousands of times, and could disturb the vital activities of millions more.¹⁴

Fish

Fish species vary in their ability to detect and use sound, and seismic airgun noise therefore has a range of impacts on fish species. Seismic airgun noise elicits varying degrees of startle and alarm responses in fish, including escape responses, and changes in schooling patterns, water column positions and swim speeds.¹⁵

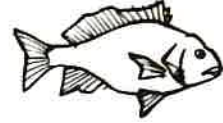
Examples include:

- 40-80 percent reduced catch rates in Atlantic cod, haddock, rockfish, herring, sand eel and blue whiting.^{16 17 18 19 20}
- 78 percent decline in reef fish abundance during evening hours, the time of day when fish habitat use is typically highest for the study area.²¹





- Behavioral responses in cod, such as swimming away from seismic sources, and damaged hearing structures in pink snapper.²²
- Elevated stress hormones and chemicals in sea bass.²³
- Schools of some fish species, including blue whiting, moving lower in the water column, which could take extra energy or displace the fish from behaviors needed for survival.²⁴



Invertebrates (shellfish)

Invertebrate exposure to seismic noise can cause physical injury and mortality at near-distances and impede development of early life history stages.

Examples include:

- Significant increase in mortality for scallops exposed to seismic airgun noise, particularly over long periods of time.^{25 26}
- Stress responses, including physiological changes, in bivalves, which are clam-like species.²⁷
- Slower development rates in crabs²⁸ and scallop larvae²⁹ after repeated exposure to nearby seismic sound.
- Damage to small organs that control balance and orientation in rock lobsters³⁰ and spiny lobsters,³¹ up to a year after seismic airgun blasting occurred.
- Distinctive flinching response and persistent alterations in reflex behavior for scallops following exposure to seismic airguns.³²
- Sensory and internal organ damage in seven stranded giant squid after nearby seismic surveys.³³
- Significant decrease in zooplankton abundance, and a two- to threefold increase in dead adult and larval zooplankton at distances of at least $\frac{3}{4}$ miles from seismic source.³⁴

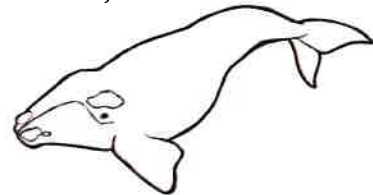


Whales

Marine mammals rely on sound for feeding, communication, navigation and other behaviors necessary for survival. Seismic airgun noise can cause hearing impairment as well as physiological and behavioral changes.³⁵ These include avoidance, displacement, communication masking, vocalization changes and chronic stress, which could cause increases in stress hormones,³⁶ lead to behavioral changes, and reduce effectiveness of the immune system.³⁷

Examples include:

- Changes in Bowhead Whale breathing patterns, avoidance and silencing of calls, which could interrupt communication between whales, including mothers, calves and potential mates.^{38 39 40}
- Declines in the feeding rates of Sperm Whales.⁴¹
- Altered Fin Whale vocalizations, which are important for communication, and abandonment of habitat.⁴²





- Responses of North Atlantic Right Whale to other sources of low-frequency noise demonstrates that noise may be associated with increases in stress-related hormones in baleen whales.⁴³

Sea Turtles

Sea turtle hearing range overlaps with the higher frequency noises from seismic airguns. Studies show that seismic airgun noise can negatively affect sea turtles.

Examples include:

- Increases in erratic swimming behavior.⁴⁴
- Responses, including swimming away from the noise source, suggesting avoidance of seismic noise.⁴⁵
- Risk of entanglement in survey equipment.⁴⁶



Conclusion

The United States should protect the diverse array of whales, fish, turtles and invertebrates that live along the Atlantic coast and are threatened by proposed seismic airgun blasting. The potential damage to marine animals and ecosystems, and the communities and industries that depend on these resources, is too great to risk.

The National Marine Fisheries Service should not approve Incidental Harassment Authorizations (IHAs) nor should the Bureau of Ocean Energy Management approve the permits for seismic airgun blasting in the Atlantic. If the IHAs and seismic permits are approved, Oceana recommends the following mitigation practices to minimize harm to marine life:

- Sharing of data between companies, the government and the public so seismic airgun blasting happens only once and impacts are minimized.
- Require that companies fund third party passive acoustic monitoring before, during and after seismic airgun blasting to observe any effects on marine life, archive acoustic data recordings and immediately stop seismic airgun surveys if animals are detected during the surveys.
- Require third party visual observers to watch for whales, dolphins and sea turtles before, during and after the seismic airgun surveys, record sightings and immediately stop seismic airgun blasting if animals are within view.
- Do not conduct seismic airgun blasting during endangered and threatened species calving or nesting seasons, or in Critical Habitat areas, Essential Fish Habitat, or in other areas important to the survival of fish, invertebrates, sea turtles or marine mammals.

Citations can be found here:

http://usa.oceana.org/sites/default/files/662/seismic_fact_sheet_long_final_7-25.pdf



Citations:

- ¹ Badelt B (2015). The Inventor of the Seismic Air Gun Is Trying to Supplant His Controversial Creation. *Hakai Magazine*. Available: <https://www.hakaimagazine.com/article-short/inventor-seismic-air-gun-trying-supplant-his-controversial-creation>
- ² The Acoustic Ecology Institute (2004) Seismic Surveys at Sea: The contributions of airguns to ocean noise. *Backgrounder*. Available: <https://www.acousticecology.org/oceanseismicplans.html>
- ³ National Research Council (2003) Ocean Noise and Marine Mammals. Washington, DC: *The National Academies Press*.
- ⁴ The Acoustic Ecology Institute (2004) Seismic Surveys at Sea: The contributions of airguns to ocean noise. *Backgrounder*. Available: <https://www.acousticecology.org/oceanseismicplans.html>
- ⁵ National Research Council (2003) Ocean Noise and Marine Mammals. Washington, DC: *The National Academies Press*.
- ⁶ Blackwell S, et al. (2015) Effects of Airgun Sounds on Bowhead Whale Calling Rates: Evidence for Two Behavioral Thresholds. *PLoS ONE* 10.6
- ⁷ National Research Council (2003) Ocean Noise and Marine Mammals. Washington, DC: *The National Academies Press*.
- ⁸ Schuler, M (2015). MV Sanco Sword Tows Record-Setting Seismic Streamer Spread. *gCaptain*. Available: <http://gcaptain.com/mv-sanco-sword-tows-record-setting-seismic-streamer-spread/#.VoGysZtHIYA> Accessed: June 28, 2017
- ⁹ Nieuwkirk S, et al. (2012) Sounds from airguns and fins whales recorded in the mid-Atlantic Ocean, 1999-2009. *The Journal of the Acoustical Society of America*, 131(2), 1102-1112.
- ¹⁰ Thode, A., et al. (2010). Long range transmission loss of broadband seismic pulses in the Arctic under ice-free conditions. *The Journal of the Acoustical Society of America*, 128(4), EL181-EL187.
- ¹¹ Nieuwkirk, S., et al. (2012) Sounds from airguns and fins whales recorded in the mid-Atlantic Ocean, 1999-2009. *The Journal of the Acoustical Society of America*, 131: 1102-1112.
- ¹² The White House (2017) Presidential Executive Order Implementing and America-First Offshore Energy Strategy. In: *Office of the Press Secretary*. Available: <https://www.whitehouse.gov/the-press-office/2017/04/28/presidential-executive-order-implementing-america-first-offshore-energy>. Accessed June 16, 2017.
- ¹³ The Department of the Interior (2017) Interior Department Advances America-First Offshore Energy Strategy. In: *Office of the Secretary*. Available: <https://www.doi.gov/pressreleases/interior-department-advances-america-first-offshore-energy-strategy> Accessed June 28, 2017.
- ¹⁴ BOEM (2012) Atlantic OCS Proposed Geological and Geophysical Activities Mid-Atlantic and South Atlantic Planning Areas, Final Programmatic Environmental Impact Statement. In: *Tables*. Available: <https://www.boem.gov/BOEM-2014-001-v1/> Accessed June 16, 2017.
- ¹⁵ McCauley R, et al. (2000) Marine seismic surveys – A Study of Environmental Implications. *APPEA Journal*. 692-708.
- ¹⁶ Lokkeborg S (1991) Effects of a geophysical survey on catching success in longline fishing. *ICES CM Documents*.
- ¹⁷ Engas A, et al. (1996) Effects of seismic shooting on local abundance and catch rates of cod (*Gadus morhua*) and haddock (*Melanogrammus aeglefinus*). *Canadian Journal of Fisheries and Aquatic Sciences*, 53: 2238-2249. doi: 10.1139/cjfas-53-10-2238.
- ¹⁸ Skalski J, et al. (1992) Effects of sounds from a geophysical survey device on catch-per-unit-effort in a hook-and-line fishery for rockfish (*Sebastes* spp.). *Canadian Journal of Fisheries and Aquatic Sciences*, 49:1357-1365.
- ¹⁹ Hassel A, et al. (2004) Influence of seismic shooting on the lesser sandeel (*Ammodytes marinus*). *ICES Journal of Marine Science: Journal du Conseil*, 61: 1165-1173.
- ²⁰ Slotte A, et al. (2004) Acoustic mapping of pelagic fish distribution and abundance in relation to a seismic shooting area off the Norwegian west coast. *Fisheries Research*, 67: 143-150. doi: 10.1016/j.fishres.2003.09.046
- ²¹ Paxton AB, et al. (2017) Seismic survey noise disrupted fish use of a temperate reef. *Marine Policy*: 78:68 - 73. doi: 10.1016/j.marpol.2016.12.017
- ²² McCauley R, et al. (2000) Marine seismic surveys: Analysis of airgun signals; and effects of air gun exposure on humpback whales, sea turtles, fishes and squid. *Rep. from Centre for Marine Science and Technology, Curtin Univ., Perth, WA, for Austral. Petrol. Prod. Assoc., Sydney, NSW*, 8-5.
- ²³ Santulli A, et al. (1999) Biochemical responses of European sea bass (*Dicentrarchus labrax* L) to the stress induced by offshore experimental seismic prospecting. *Marine Pollution Bulletin*. 38: 1105-1114.
- ²⁴ Slotte A, et al. (2004) Acoustic mapping of pelagic fish distribution and abundance in relation to a seismic shooting area off the Norwegian west coast. *Fisheries Research*. 67:143-150.
- ²⁵ Semmens J, et al. (2017) Are seismic surveys putting bivalve and spiny lobster fisheries at risk. *Oceanoise 2017 Conference Presentation*, Vilanova i la Geltrú, Barcelona, Spain.



- ²⁶ Day R, *et al.* (2016) Assessing the impact of marine seismic surveys on Southeast Australian scallop and lobster fisheries. University of Tasmania: FRDC Report.
- ²⁷ Moriyasu M, *et al.* (2004) Effects of seismic and marine noise on invertebrates: A literature review. *Canadian Science Advisory Secretariat*. Research document 2004/126: 1-43.
- ²⁸ Christian J, (2003) Effect of seismic energy on snow crab (*Chionoecetes opilio*). *Fisheries and Oceans Canada*. Environmental Funds Project No. 158.
- ²⁹ Aguilar de Soto N, *et al.* (2013) Anthropogenic noise causes body malformations and delays development in marine larvae. *Scientific Reports*. 3: 283 doi:10.1038/srep02831.
- ³⁰ Day R, *et al.* (2016) Assessing the impact of marine seismic surveys on Southeast Australian scallop and lobster fisheries. University of Tasmania: FRDC Report.
- ³¹ Semmens J, *et al.* (2017) Are seismic surveys putting bivalve and spiny lobster fisheries at risk. *Oceanoise 2017 Conference Presentation*, Vilanova i la Geltrú, Barcelona, Spain.
- ³² Day R, *et al.* (2016) Assessing the impact of marine seismic surveys on Southeast Australian scallop and lobster fisheries. University of Tasmania: FRDC Report.
- ³³ Guerra Á, *et al.* (2004) A review of the records of giant squid in the north-eastern Atlantic and severe injuries in *Architeuthis dux* stranded after acoustic explorations. *ICES CM*. 200: 29.
- ³⁴ McCauley R, *et al.* (2017) Widely used marine seismic survey air gun operations negatively impact zooplankton. *Nature Ecology & Evolution*. Article number: 0195. doi:10.1038/s41559-017-0195
- ³⁵ Gordon J, *et al.* (2004) A review of the effects of seismic surveys on marine mammals. *Marine Technology Society Journal*. 37:16 – 34.
- ³⁶ Dalin A, *et al.* (1993) The effect of transport stress on plasma levels of catecholamines, cortisol, corticosteroid-binding globulin, blood cell count, and lymphocyte proliferation. *Acta Veterinaria Scandinavica*. 34:59-68
- ³⁷ Gordon J, *et al.* (2004) A review of the effects of seismic surveys on marine mammals. *Marine Technology Society Journal*. 37:16 – 34.
- ³⁸ Richardson W, *et al.* (1999) Displacement of migrating bowhead whales by sounds from seismic surveys in shallow waters of the Beaufort Sea. *The Journal of the Acoustical Society of America*. 106: 2281-2281.
- ³⁹ Robertson F, *et al.* (2013). Seismic operations have variable effects on dive-cycle behavior of bowhead whales in the Beaufort Sea. *Endangered Species Research*. 21:143-160. Doi: 10.3354/esr00515.
- ⁴⁰ Blackwell S, *et al.* (2013) Effects of airgun sounds on bowhead whale calling rates in the Alaskan Beaufort Sea. *Marine Mammal Science*. 29(4).
- ⁴¹ Miller P, *et al.* (2009) Using at-Sea Experiments to Study the Effects of Airguns on the Foraging Behavior of Sperm Whales in the Gulf of Mexico. *Deep-Sea Research Part I-Oceanographic Research Papers* 56: 1168-81.
- ⁴² Castellote M, *et al.* (2012) Acoustic and Behavioural Changes by Fin Whales (*Balaenoptera Physalus*) in Response to Shipping and Airgun Noise. *Biological Conservation* 147: 115-22.
- ⁴³ Rolland RM, *et al.* (2012) Evidence That Ship Noise Increases Stress in Right Whales. *Proceedings of the Royal Society - Biological Sciences*. 279: 2363-68.
- ⁴⁴ McCauley, R., *et al.* (2000) Marine seismic surveys: Analysis of airgun signals; and effects of air gun exposure on humpback whales, sea turtles, fishes and squid. *Rep. from Centre for Marine Science and Technology, Curtin Univ., Perth, WA, for Austral. Petrol. Prod. Assoc., Sydney, NSW*, 8-5.
- ⁴⁵ McCauley, R., *et al.* (2000) Marine seismic surveys: Analysis of airgun signals; and effects of air gun exposure on humpback whales, sea turtles, fishes and squid. *Rep. from Centre for Marine Science and Technology, Curtin Univ., Perth, WA, for Austral. Petrol. Prod. Assoc., Sydney, NSW*, 8-5.
- ⁴⁶ Weir C (2007) Observations of marine turtles in relation to seismic airgun sound off Angola. *Marine Turtle Newsletter*. 116:17-20.