

# Test Report

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## 1 Configuration

### 1.1 Technology: Ocean Current

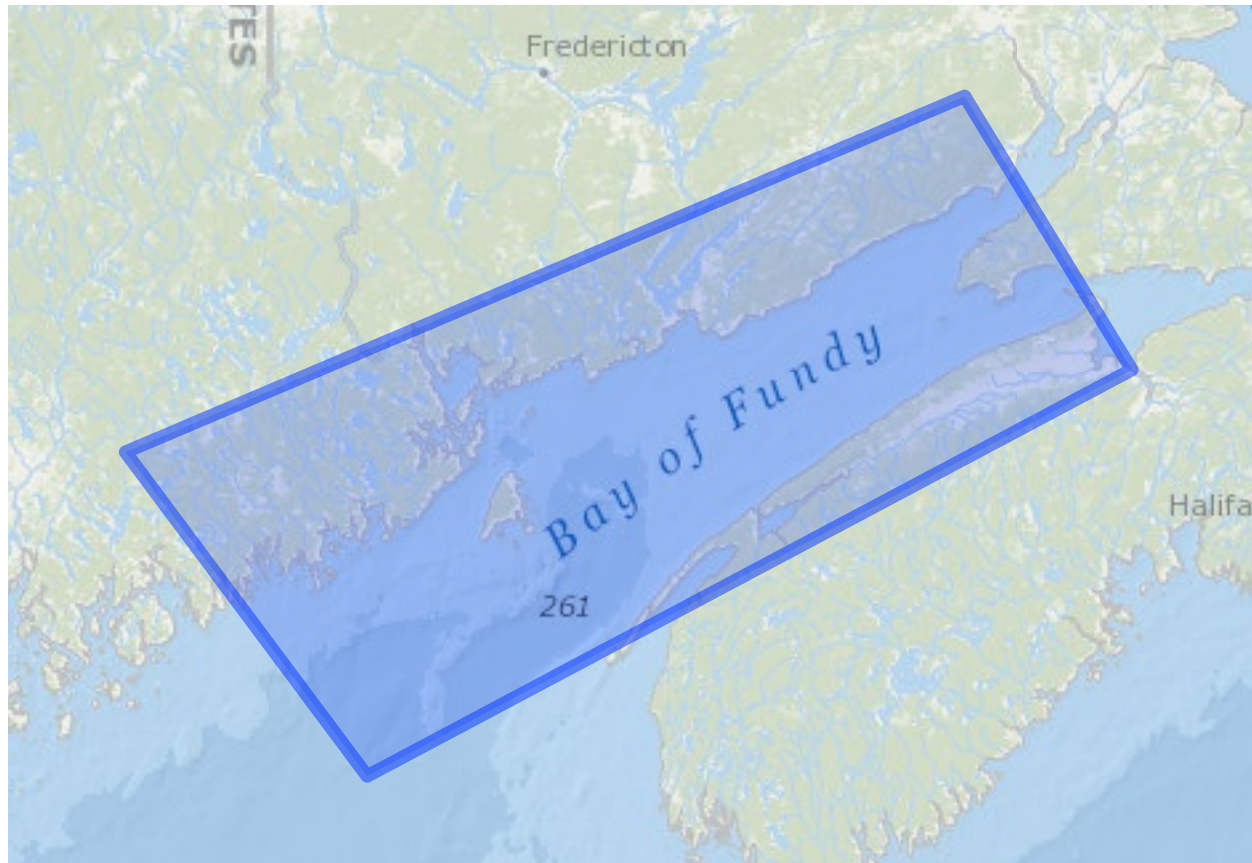


### 1.2 Stressors & Receptors

- Stressors
  - Noise

- Receptors
  - Cetaceans
  - Pinnipeds
- Stressor-Receptors
  - Cetaceans AND Noise
  - Pinnipeds AND Noise

### 1.3 Location



## 2 Literature

### 2.1 Stressors

Stressors are potentially harmful environmental effects from technology for marine renewable energy.

#### 2.1.1 Noise

Literature from Tethys Knowledge Base}.:

1. A three-dimensional underwater sound propagation model for offshore wind farm noise prediction
2. Low-frequency acoustic pressure, velocity, and intensity thresholds in a bottlenose dolphin (*Tursiops truncatus*) and white whale (*Delphinapterus leucas*)
3. Development of an air bubble curtain to reduce underwater noise of percussive piling
4. Effects of underwater noise on auditory sensitivity of a cyprinid fish
5. Whale-call response to masking boat noise

6. AdBm Demonstration at Butendiek Offshore Wind Farm with Ballast Nedam
7. Acoustic characterization of sensors used for marine environmental monitoring
8. Evidence that ship noise increases stress in right whales
9. Widely used marine seismic survey air gun operations negatively impact zooplankton
10. Underwater Acoustic Modeling Report - Virginia Offshore Wind Technology Advancement Project (VOWTAP)
11. Environmental Effects Monitoring Report 2011-2013
12. Environmental Effects Monitoring Program Annual Report 2017
13. Basin-wide contributions to the underwater soundscape by multiple seismic surveys with implications for marine mammals in Baffin Bay, Greenland
14. The Behavioural and Physiological Effects of Pile-driving Noise on Marine Species
15. Noise mitigation during pile-driving efficiently reduces disturbance of marine mammals
16. Characterization of impact pile driving signals during installation of offshore wind turbine foundations
17. Evaluating Statistical Models for Baseline Characterization and Measuring Change in Environmental Monitoring Data
18. Vessel noise cuts down communication space for vocalizing fish and marine mammals
19. Lost listening area assessment of anthropogenic sounds in the Chukchi Sea
20. Startle response of captive North Sea fish species to underwater tones between 0.1 and 64 kHz
21. Characterisation of underwater operational sound of a tidal stream turbine
22. Swimming behavior of roach (*rutilus rutilus*) and three-spined stickleback (*gasterosteus aculeatus*) in response to wind power noise and single-tone frequencies
23. Effects of hydrokinetic turbine sound on the behavior of four species of fish within an experimental mesocosm
24. Testing the Effectiveness of an Acoustic Deterrent for Grey Whales Along the Oregon Coast
25. Obtaining Baseline Measurements of Ocean Ambient Sound at a Mobile Test Berth Site for Wave Energy Conversion Off the Central Oregon Coast
26. Noise mitigation systems and low-noise installation technologies
27. Underwater construction and operational noise at alpha ventus
28. Marine mammals and windfarms: Effects of alpha ventus on harbour porpoises
29. Investigations of the Bird Collision Risk and the Responses of Harbour Porpoises in the Offshore Wind Farms Horns Rev, North Sea, and Nysted, Baltic Sea, in Denmark - Part II: Harbour porpoises
30. Underwater noise levels of pile-driving in a New Zealand harbour, and the potential impacts on endangered Hector's dolphins
31. Request for advice about the displacement of marine mammals around operational offshore windfarms
32. Wind turbines cause chronic stress in badgers (*Meles meles*) in Great Britain
33. Providing ecological context to anthropogenic subsea noise: Assessing listening space reductions of marine mammals from tidal energy devices
34. The Effect of Simulated Seal Scarer Sounds on Harbour Porpoises
35. Interdisciplinary study into the effect of a marine renewable energy testing facility on the underwater sound in Falmouth Bay
36. Effects of larger turbines for the offshore wind farm at Krieger's Flak, Sweden. Assessment of impact on marine mammals
37. Investigations into the effects of pile driving at the offshore wind farm Horns Rev II and the FINO III research platform
38. Takes of Marine Mammals Incidental to Specified Activities; Pile Placement for ORPC Maine's Cobscook Bay Tidal Energy Pilot Project
39. Underwater Anthropogenic Sound: Understanding the potential impacts on the marine environment and the influence on crab larval behaviour
40. Grassland bird community and acoustic complexity appear unaffected by proximity to a wind energy facility in the Nebraska Sandhills
41. Cobscook Bay Tidal Energy Project: 2016 Environmental Monitoring Report
42. Exposure-response relationship of wind turbine noise with self-reported symptoms of sleep and health problems: A nationwide socioacoustic survey in Japan
43. Noise characterization of a subsea tidal kite

44. The song of Skylarks *Alauda arvensis* indicates the deterioration of an acoustic environment resulting from wind farm start-up
45. Final Underwater Noise Analysis of Cape Wind Energy Project
46. Male Greater Prairie-Chickens Adjust their Vocalizations in the Presence of Wind Turbine Noise
47. Broad-Scale Acoustic Monitoring for Cetaceans and Underwater Noise in Relation to Offshore Wind Farm Construction in Scotland
48. Acoustic Life Cycle Assessment of Offshore Renewables - Implications from a Wave-Energy Converter Deployment in Falmouth Bay, UK
49. Semi-Active Control of Sound Radiated From an Elastic Circular Plate Integrated With Adaptive Tuned Vibration Absorbers
50. Sensitivity of the Mussel *Mytilus edulis* to Substrate-Borne Vibration in Relation to Anthropogenically Generated Noise
51. Good or Bad Vibrations? Impacts of Anthropogenic Vibration on the Marine Epibenthos
52. Acoustic characterization of submarine cable installation in the Biscay Marine Energy Platform (bimep)
53. Low-cost acoustic design of a bat test room
54. Underwater Noise Propagation Models and its Application in Renewable Energy Parks: WaveRoller Case Study
55. Monitoring the Condition of Marine Renewable Energy Devices through Underwater Acoustic Emissions: Case study of a Wave Energy Converter in Falmouth Bay, UK
56. Massachusetts Study on Wind Turbine Acoustics
57. Changes in Fish Catch Rates in the Presence of Air Gun Sounds in Prudhoe Bay, Alaska
58. Noise Propagation Calculations of a Wind Turbine in Complex Terrain
59. Wind turbine noise assessment in a small and quiet community in Finland
60. Perception and annoyance due to wind turbine noise-a dose-response relationship
61. A Review of the Potential Impacts of Wind Turbine Noise in the Australian Context
62. Windmill Noise Annoyance, Visual Aesthetics, and Attitudes towards Renewable Energy Sources
63. Social survey on wind turbine noise in Japan
64. Nationwide field measurements of wind turbine noise in Japan
65. Continuation Implementation Masterplan Wind at Sea
66. Monitoring and Research Shortlist Offshore Wind - Knowledge advancements and follow up
67. Effects of Offshore Pile Driving on Harbour Porpoise Abundance in the German Bight: Assessment of Noise Effects
68. Assessing Auditory Evoked Potentials of Wild Harbor Porpoises (*Phocoena phocoena*)
69. Marine Wind Farms and Cetaceans
70. Effects of Offshore Wind Farms on the Early Life Stages of *Dicentrarchus labrax*
71. Soundscape and Noise Exposure Monitoring in a Marine Protected Area Using Shipping Data and Time-Lapse Footage
72. Fulfilling EU Laws to Ensure Marine Mammal Protection During Marine Renewable Construction Operations in Scotland
73. Multiple-Pulse Sounds and Seals: Results of a Harbor Seal (*Phoca vitulina*) Telemetry Study During Wind Farm Construction
74. Understanding the Population Consequences of Acoustic Disturbance for Marine Mammals
75. Expert Elicitation Methods in Quantifying the Consequences of Acoustic Disturbance from Offshore Renewable Energy Developments
76. Underwater Sound Levels at a Wave Energy Device Testing Facility in Falmouth Bay, UK
77. Predicting Anthropogenic Noise Contributions to US Waters
78. Mapping Underwater Sound in the Dutch Part of the North Sea
79. A Portable, Real-Time Passive Acoustic System and Autonomous Hydrophone Array for Noise Monitoring of Offshore Wave Energy Projects
80. Seasonal and Diel Variability of the Underwater Noise in the Baltic Sea
81. Environmental Monitoring of the Paimpol-Brehat Tidal Project
82. Human Perception of Sound from Wind Turbines
83. The Effects of Noise on Aquatic Life II

84. Characterizing Large River Sounds: Providing Context for Understanding the Environmental Effects of Noise Produced by Hydrokinetic Turbines
85. Classification of Three-Dimensional Ocean Features using Three-Dimensional Empirical Orthogonal Functions
86. Field Calibration a Tool for Acoustic Noise Prediction: The CALCOM'10 Data Set
87. Auditory and Behavioral Responses of California Sea Lions (*Zalophus californianus*) to Single Underwater Impulses from an Arc-Gap Transducer
88. Hermosa West Wind Energy Project Draft EIS - Appendix F: Bat Acoustical Studies
89. A GIS-Multicriteria Approach to Analyzing Noise and Visual Impacts of Wind Farms
90. Effects of Acoustic Deterrents on Foraging Bats
91. Effects of marine noise pollution on Mediterranean fishes and invertebrates: A review
92. The role of ambient sound levels, signal-to-noise ratio, and stimulus pulse rate on behavioural disturbance of seabass in a net pen
93. Behavioural responses in a congested sea: an observational study on a coastal nest-guarding fish
94. Auditory Recognition of Familiar and Unfamiliar Subjects with Wind Turbine Noise
95. Acoustic Noise Associated with the MOD-1 Wind Turbine: Its Source, Impact, and Control
96. Fairhead Tidal Environmental Impact Assessment Scoping Document
97. A Survey of Acoustic Harassment Device (AHD) Use in the Bay of Fundy, NB, Canada
98. Underwater Noise Modelling for Environmental Impact Assessment
99. An Italian Proposal on the Monitoring of Underwater Noise: Relationship Between the EU Marine Strategy Framework Directive (MSFD) and Marine Spatial Planning Directive (MSP)
100. Acoustic Characterization of a Hydrokinetic Turbine
101. Discussion of the Effects of the Underwater Noise Radiated by a Wave Energy Device - Portugal
102. Impacts of Anthropogenic Noise on Marine Life: Publication Patterns, New Discoveries, and Future Directions in Research and Management
103. Validation of Finite Element Computations for the Quantitative Prediction of Underwater Noise from Impact Pile Driving
104. Baseline Measurement of Underwater Noise Under the SURGE Project
105. Underwater Mach Wave Radiation from Impact Pile Driving: Theory and Observation
106. MeyGen Tidal Energy Project Phase 1: Environmental Statement
107. Measurement of Long-Term Ambient Noise and Tidal Turbine Levels in the Bay of Fundy
108. Hydroacoustic Measurements of the Noise Radiated from Wave Energy Converters in the Lysekil Project and Project WESA
109. Comparison of Underwater Background Noise during Spring and Neap Tide in a High Tidal Current Site: Ramsey Sound
110. Assessment of Underwater Noise Generated by Wave Energy Devices
111. Environmental Monitoring Report - 2011 Installation of Monopile at Voith Hydro Test Berth, Fall of Warness, Orkney
112. Scoping Study: Review of Current Knowledge of Underwater Noise Emissions from Wave and Tidal Stream Energy Devices
113. A Computational Method to Predict and Study Underwater Noise due to Pile Driving
114. Cod and Sole Behaviour in an Offshore Wind Farm
115. Underwater Noise from a Wave Energy Converter Is Unlikely to Affect Marine Mammals
116. Hearing Thresholds of a Harbor Porpoise (*Phocoena phocoena*) for Playbacks of Seal Scarer Signals, and Effects of the Signals on Behavior
117. The Effects of Noise on Aquatic Life
118. Sound Exposure in Harbour Seals During the Installation of an Offshore Wind Farm: Predictions of Auditory Damage
119. Estimation of Acoustic Particle Motion and Source Bearing Using a Drifting Hydrophone Array Near a River Current Turbine to Assess Disturbances to Fish
120. Noise Mitigation Measures and Low-noise Foundation Concepts - State of the Art
121. Underwater Noise Produced by the Piling Activities During the Construction of the Belwind Offshore Wind Farm (Bligh Bank, Belgian Marine Waters)
122. Airborne Sound Propagation Over Sea During Offshore Wind Farm Piling

123. Eco-Hydro-Acoustic Modeling and its Use as an EIA Tool
124. Effects of Noise and By-Catch on a Danish Harbour Porpoise Population
125. The Cumulative Effect on Sound Levels from Multiple Underwater Anthropogenic Sound Sources in Shallow Coastal Waters
126. Did the Pile Driving during the Construction of the Offshore Wind Farm Egmond aan Zee, the Netherlands, Impact Porpoises?
127. Did the Pile Driving during the Construction of the Offshore Wind Farm Egmond aan Zee, the Netherlands, Impact Local Seabirds?
128. Effects of Pile-Driving on Harbour Porpoises (*Phocoena phocoena*) at the First Offshore Wind Farm in Germany
129. Acoustic Deterrent Workshop National Wind Technology Center, Louisville, CO
130. Underwater Radiated Noise from Point Absorbing Wave Energy Converters: Noise Characteristics and Possible Environmental Effects
131. On Certain Problems Concerning Environmental Impact Assessment of Wind Turbines in Scope of Acoustic Effects
132. The Effects of Wind Turbines on Antipredator Behavior in California Ground Squirrels (*Spermophilus beecheyi*)
133. The Remote Environmental Assessment Laboratory's Acoustic Library: An Archive for Studying Soundscape Ecology
134. Ambient noise in an urbanized tidal channel
135. Long Term Monitoring of Underwater Noise at a Proposed Deployment Site of a Tidal Stream Device
136. Experimental Evidence for the Effects of Chronic Anthropogenic Noise on Abundance of Greater Sage-Grouse at Leks
137. Experimental Chronic Noise Is Related to Elevated Fecal Corticosteroid Metabolites in Lekking Male Greater Sage-Grouse (*Centrocercus urophasianus*)
138. Stakeholders or Subject Matter Experts, who Should be consulted?
139. Acoustic Monitoring Techniques for Avian Detection and Classification
140. Evaluations of Wind Potential in Dobrogea Plateau
141. Study and Application of Underwater Noise Impact in Coastal Region off Western Taiwan
142. Responses of Harbour Porpoises to Pile Driving on a Temporal and Spatial Scale
143. Towards a Numerical Model to Simulate the Observed Displacement of Harbour Porpoises *Phocoena phocoena* Due to Pile Driving in Belgian Waters
144. Hydro Sound Measurements during the Installation of Large Diameter Offshore Piles using Combinations of Independent Noise Mitigation Systems
145. Dynamic Measurements of Pile Deflections as a Source of Underwater Sound Emissions during Impact Driving of Offshore Pile Foundations
146. New Achievements in Underwater Noise Modelling for Offshore Pile Driving
147. Lake Michigan Offshore Wind Feasibility Assessment
148. Assessing Environmental Impacts of Offshore Wind Farms: Lessons Learned and Recommendations for the Future
149. Grey Seals use Anthropogenic Signals from Acoustic Tags to Locate Fish: Evidence from a Simulated Foraging Task
150. Assessing the Underwater Acoustics of the World's Largest Vibration Hammer (OCTA-KONG) and Its Potential Effects on the Indo-Pacific Humpbacked Dolphin (*Sousa chinensis*)
151. The Significance of Parameter Uncertainties for the Prediction of Offshore Pile Driving Noise
152. Amplitude modulation of wind turbine sound in cold climates
153. Development of Noise Mitigation Measures in Offshore Wind Farm Construction
154. Source Levels of the Underwater Calls of a Male Leopard Seal
155. In Situ Mortality Experiments with Juvenile Sea Bass (*Dicentrarchus labrax*) in Relation to Impulsive Sound Levels Caused by Pile Driving of Windmill Foundations
156. Habitat Preferences of Harbour Seals in the Dutch Coastal Area: Analysis and Estimate of Effects of Offshore Wind Farms
157. Marine Mammals and Ocean Noise: Future Directions and Information Needs with Respect to Science, Policy and Law in Canada

158. Long-range Effects of Airgun Noise on Marine Mammals: Responses as a Function of Received Sound Level and Distance
159. Aversiveness of Sounds in Phocid Seals: Psycho-Physiological Factors, Learning Processes and Motivation
160. Escape Responses of Hauled out Ringed Seals (*Phoca hispida*) to Aircraft Disturbance
161. Modeling of Underwater Noise from Pile Driving using Coupled Finite Element and Parabolic Equation Model with Improved Parabolic Equation Starting Field
162. Effects of Offshore Pile Driving on Harbor Porpoises (*Phocoena phocoena*)
163. Evidence of a Lombard Response in Migrating Humpback Whales (*Megaptera novaeangliae*)
164. The Measurement and Prediction of Underwater Noise from Impact Pile Driving during the Construction of Offshore Wind Farm
165. Development of a Unique Instrumentation System to Monitor Underwater Noise Due to Pile Driving
166. Acoustic Environmental Monitoring - Wello Penguin Cooling System Noise Study
167. Underwater Radiated Noise Due to the Piling for the Q7 Offshore Wind Park
168. Discovery of Sound in the Sea
169. Underwater Active Acoustic Monitoring Network For Marine And Hydrokinetic Energy Projects
170. Flow-Noise and Turbulence in Two Tidal Channels
171. Long-Term, Global-Scale Statistics of Sound Propagation
172. Long Term Estimations of Low Frequency Noise Levels over Water from an Off-Shore Wind Farm
173. Characteristics of the Operational Noise from Full Scale Wave Energy Converters in the Lysekil Project: Estimation of Potential Environmental Impacts
174. Underwater Noise Measurements of a 1/7th Scale Wave Energy Converter
175. Underwater Noise from Construction and Operation of Offshore Wind Farms
176. Underwater Noise of Whale Watching Boats and Potential Effects on Killer Whales (*Orcinus orca*), Based on an Acoustic Impact Model
177. Underwater Surf Noise Near Sea Coasts of Different Types
178. Underwater Radiated Noise from Modern Commercial Ships
179. Vessel Noise Effects On Delphinid Communication
180. Threshold for Onset of Injury in Chinook Salmon from Exposure to Impulsive Pile Driving Sounds
181. Turbine Sound May Influence the Metamorphosis Behaviour of Estuarine Crab Megalopae
182. Underwater Ambient Noise at a Proposed Tidal Energy Site in Puget Sound
183. Underwater Noise From Three Types Of Offshore Wind Turbines: Estimation Of Impact Zones For Harbor Porpoises And Harbor Seals
184. Temporal Patterns In Ambient Noise Of Biological Origin From A Shallow Water Temperate Reef
185. The Acoustics And Acoustic Behavior Of The California Spiny Lobster (*Panulirus interruptus*)
186. The Effect of Acoustic Harassment Devices on Harbour Porpoises (*Phocoena phocoena*) in the Bay of Fundy, Canada
187. Summary on Harbour Porpoise Monitoring 1999-2006 around Nysted and Horns Rev Offshore Wind Farms
188. Baseline assessment of underwater noise in the Ria Formosa
189. Responses of Harbour Porpoises to Pile Driving at the Horns Rev II Offshore Wind Farm in the Danish North Sea
190. Particle Motion Measured at an Operational Wind Turbine in Relation to Hearing Sensitivity in Fish
191. Perception of Low-Frequency Acoustic Signals by a Harbour Porpoise (*Phocoena phocoena*) in the Presence of Simulated Offshore Wind Turbine Noise
192. Pile Driving Zone of Responsiveness Extends Beyond 20 km for Harbour Porpoises (*Phocoena phocoena* (L.))
193. Predicting Underwater Radiated Noise Levels due to the First Offshore Wind Turbine Installation in the U.S.
194. Noise Measurements Of A Prototype Tidal Energy Turbine
195. Noise Negatively Affects Foraging and Antipredator Behaviour in Shore Crabs
196. Modelling the Vertical Directivity of Noise from Underwater Drilling
197. Measurement of Underwater Noise During Piling at the Red Funnel Terminal, Southampton, and Observation of its Affect on Caged Fish

198. Listening In
199. Making the Case for the Sound Management of Marine Protected Areas
200. Is a German Harbour Porpoise Much More Sensitive than a British One? Comparative Analyses of Mandatory Measures for the Protection of Harbour Porpoises (*Phocoena phocoena*) During Offshore Wind Farm Ramming in Germany, Denmark and the UK
201. Impact Assessment of an Off-shore Wind Park on Sea Ducks
202. Framework for Assessing Impacts of Pile-Driving Noise from Offshore Wind Farm Construction on a Harbour Seal Population
203. Gray Whales, *Eschrichtius robustus*, Avoid the Underwater Sounds of Killer Whales, *Orcinus orca*
204. Estimates of Water Turbine Noise Levels
205. Exposure to Seismic Survey Alters Blue Whale Acoustic Communication
206. Effects of the Construction of Scroby Sands Offshore Wind Farm on the Prey Base of Little Tern *Sternula albifrons* at its Most Important UK Colony
207. Environmental Assessment of Offshore Wind Power Generation near Rhode Island: Acoustic and Electromagnetic Effects on Marine Animals [Presentation]
208. Effect of the Sound Generated by an Acoustic Harassment Device on the Relative Abundance and Distribution of Harbor Porpoises (*Phocoena phocoena*) in Retreat Passage, British Columbia
209. Effects Of Ambient And Boat Noise On Hearing And Communication In Three Fish Species Living In A Marine Protected Area (Miramare, Italy)
210. Effects Of Tidal Turbine Noise On Fish Hearing And Tissues
211. Effects of Marine Windfarms on the Distribution of Fish, Shellfish and Marine Mammals in the Horns Rev Area
212. Effects of Pile-Driving Noise on the Behaviour of Marine Fish
213. Differentiating Between Underwater Construction Noise of Monopile and Jacket Foundations for Offshore Windmills: A Case Study from the Belgian Part of the North Sea
214. Context-Dependent Impacts of Anthropogenic Noise on Individual and Social Behaviour in a Cooperatively Breeding Fish
215. Broadband Acoustic Environment at a Tidal Energy Site in Puget Sound
216. Changes in Humpback Whale Song Occurrence in Response to an Acoustic Source 200 km Away
217. Characterizing the Relative Contributions of Large Vessels to Total Ocean Noise Fields: A Case Study Using the Gerry E. Studds Stellwagen Bank National Marine Sanctuary
218. Assessment of Basic Audiometric Functions in Killer Whales (*Orcinus orca*) at Loro Parque, Tenerife, Spain
219. Averaging Underwater Noise Levels for Environmental Assessment of Shipping
220. Barging Effects On Sensory Systems Of Chinook Salmon Smolts
221. Behavioural Reactions of Free-Ranging Porpoises and Seals to the Noise of a Simulated 2 MW Wind-power Generator
222. An Investigation into the Effects of Underwater Piling Noise on Salmonids
223. Assessing the Responses of Coastal Cetaceans to the Construction of Offshore Wind Turbines
224. Assessing Underwater Noise Levels during Pile-Driving at an Offshore Windfarm and its Potential Effects on Marine Mammals
225. Assessment Method for Sound Radiated by Cyclically Operating Wells Turbines
226. Acoustic Masking In Marine Ecosystems: Intuitions, Analysis, And Implication
227. An Analysis of the Potential Acoustic Effects of Cape Wind's Offshore Wind Farm on Marine Mammal Populations
228. A Case Study on the Effects of Underwater Noise During the Construction of Large Offshore Wind Farms
229. A Digital Acoustic Recording Tag for Measuring the Response of Wild Marine Mammals to Sound
230. A Review of Offshore Windfarm Related Underwater Noise Sources
231. A Vessel Noise Budget for Admiralty Inlet, Puget Sound, Washington (USA)
232. Use of Static Passive Acoustic Monitoring (PAM) for monitoring cetaceans at Marine Renewable Energy Installations (MREIs) for Marine Scotland
233. The effect of vessel noise on the vocal behavior of belugas in the St. Lawrence River estuary, Canada
234. Harbour porpoise responses to pile-driving diminish over time



235. School is out on noisy reefs: the effect of boat noise on predator learning and survival of juvenile coral reef fishes
236. Acoustic Characteristics of the Lifesaver Wave Energy Converter
237. Anthropogenic noise increases fish mortality by predation
238. Effect of boat noise on the behaviour of bluefin tuna *Thunnus thynnus* in the Mediterranean Sea
239. Aquamarine Power Marine Mammal Observation Report
240. Exposure of benthic invertebrates to sediment vibration: From laboratory experiments to outdoor simulated pile-driving
241. Soundscape characterization in a dynamic acoustic environment: Grand Passage, Nova Scotia, a planned in-stream tidal energy site
242. Impulsive noise pollution in the Northeast Atlantic: Reported activity during 2015–2017
243. Determining the dependence of marine pile driving sound levels on strike energy, pile penetration, and propagation effects using a linear mixed model based on damped cylindrical spreading
244. Measuring responses of harbour seals to potential aversive acoustic mitigation signals using controlled exposure behavioural response studies
245. Noise impact assessment on the basis of onsite acoustic noise immission measurements for a representative wind farm
246. Social structure and abundance of coastal bottlenose dolphins, *Tursiops truncatus*, in the Normano-Breton Gulf, English Channel
247. A review of crustacean sensitivity to high amplitude underwater noise: Data needs for effective risk assessment in relation to UK commercial species
248. Characteristics of the soundscape before and after the construction of the Block Island Wind Farm
249. Assessment of impacts on tropical marine environment for off-shore clean energy development
250. Effects of noise-mitigated offshore pile driving on harbour porpoise abundance in the German Bight 2014-2016 (Gescha 2)
251. Effect of Pile-Driving Playback Sound Level on Fish-Catching Efficiency in Harbor Porpoises (*Phocoena phocoena*)
252. Effects of impulsive noise on marine mammals: investigating range-dependent risk
253. Acoustic impact of a wave energy converter in Mediterranean shallow waters
254. Evaluating Changes in the Marine Soundscape of an Offshore Wind Farm via the Machine Learning-Based Source Separation
255. Effects of wind turbine noise on the surrounding soundscape in the context of greater-prairie chicken courtship vocalizations
256. Potential Benefits of Vessel Slowdowns on Endangered Southern Resident Killer Whales

## 2.2 Receptors

Receptors are species, habitats and human activities of environmental concern.

### 2.2.1 Cetaceans

Literature from Tethys Knowledge Base}.::

1. Comparing the Performance of Bottom-Moored and Unmanned Surface Vehicle Towed Passive Acoustic Monitoring Platforms for Marine Mammal Detections

### 2.2.2 Pinnipeds

Literature from Tethys Knowledge Base}.::

1. Assessment of Risk to Marine Mammals from Underwater Marine Renewable Devices in Welsh Waters: Phase 2 - Studies of Marine Mammals in Welsh High Tidal Waters
2. Empirical measures of harbor seal behavior and avoidance of an operational tidal turbine
3. The Effect of Simulated Seal Scarer Sounds on Harbour Porpoises
4. Effects of larger turbines for the offshore wind farm at Krieger's Flak, Sweden. Assessment of impact on marine mammals

5. Harbour seals (*Phoca vitulina*) around an operational tidal turbine in Strangford Narrows: No barrier effect but small changes in transit behaviour
6. The Number and Distribution of Marine Mammals in the Fall of Warness, Orkney July 2006 - July 2007
7. Movements of Seals from Rødsand Seal Sanctuary Monitored by Satellite Telemetry
8. The Number and Distribution of Marine Mammals in the Fall of Warness, Orkney July 2005 - July 2006
9. Auditory and Behavioral Responses of California Sea Lions (*Zalophus californianus*) to Single Underwater Impulses from an Arc-Gap Transducer
10. Assessment of Collision Risk for Seals and Tidal Stream Turbines
11. Geographical Variation in Temporal and Spatial Vocalization Patterns of Male Harbour Seals in the Mating Season
12. Estimating Harbour Seal Abundance and Status in an Estuarine Habitat in North-East Scotland
13. Numerical Modeling of the Impact Response of Tidal Devices and Marine Mammals
14. Sound Exposure in Harbour Seals During the Installation of an Offshore Wind Farm: Predictions of Auditory Damage
15. Modelling Harbour Seal Habitat by Combining Data from Multiple Tracking
16. EMEC Fall of Warness Tidal Test Site: Wildlife Observations Project Annual Report
17. EMEC Billia Croo Wave Test Site: Wildlife Observations Project Annual Report
18. Source Levels of the Underwater Calls of a Male Leopard Seal
19. Habitat Preferences of Harbour Seals in the Dutch Coastal Area: Analysis and Estimate of Effects of Offshore Wind Farms
20. Behavioural Responses of Harbour Seals to Human-Induced Disturbances
21. Distribution of Harbour Seals in the German Bight in Relation to Offshore Wind Power Plants
22. Marine Mammals Trace Anthropogenic Structures at Sea
23. Marine Megavertebrates of Cornwall and the Isles of Scilly: Relative Abundance and Distribution
24. Summary on Seal Monitoring 1999-2005 around Nysted and Horns Rev Offshore Wind Farms
25. Offshore Wind Farms and Marine Mammals: Impacts and Methodologies for Assessing Impacts
26. Olympic Coast National Marine Sanctuary: Marine Mammals List
27. Effects of Marine Windfarms on the Distribution of Fish, Shellfish and Marine Mammals in the Horns Rev Area
28. Non-lethal management of carnivore predation: long-term tests with a startle reflex-based deterrence system on a fish farm
29. Haul-Out Behavior of Harbor Seals (*Phoca vitulina*) in Hood Canal, Washington
30. Automated detection and tracking of marine mammals: A novel sonar tool for monitoring effects of marine industry
31. Effects of noise-mitigated offshore pile driving on harbour porpoise abundance in the German Bight 2014-2016 (Gescha 2)
32. Effect of Pile-Driving Playback Sound Level on Fish-Catching Efficiency in Harbor Porpoises (*Phocoena phocoena*)
33. Three-dimensional movements of harbour seals in a tidally energetic channel: Application of a novel sonar tracking system

## 2.3 Stressor-Receptors

### 2.3.1 Cetaceans AND Noise

Literature from Tethys Knowledge Base}.

### 2.3.2 Pinnipeds AND Noise

Literature from Tethys Knowledge Base}.

1. Effects of Marine Windfarms on the Distribution of Fish, Shellfish and Marine Mammals in the Horns Rev Area

2. Effects of larger turbines for the offshore wind farm at Krieger's Flak, Sweden. Assessment of impact on marine mammals
3. Source Levels of the Underwater Calls of a Male Leopard Seal
4. Habitat Preferences of Harbour Seals in the Dutch Coastal Area: Analysis and Estimate of Effects of Offshore Wind Farms
5. The Effect of Simulated Seal Scarer Sounds on Harbour Porpoises
6. Sound Exposure in Harbour Seals During the Installation of an Offshore Wind Farm: Predictions of Auditory Damage
7. Effect of Pile-Driving Playback Sound Level on Fish-Catching Efficiency in Harbor Porpoises (*Phocoena phocoena*)
8. Effects of noise-mitigated offshore pile driving on harbour porpoise abundance in the German Bight 2014-2016 (Gescha 2)
9. Auditory and Behavioral Responses of California Sea Lions (*Zalophus californianus*) to Single Underwater Impulses from an Arc-Gap Transducer

### 3 Spatial

Spatial data of Receptors are extracted for the Location from datasets harvested predominantly from MarineCadastre.gov.

#### 3.1 Cetaceans: Biologically Important Areas for Cetaceans

Table: Source: NOAA CetSound

Spatial: within 10 nautical miles of site

Species	Behavior	Time	Place
Humpback whale ( <i>Megaptera novaeangliae</i> )	Feeding	March - December	Gulf of Maine; Stellwagen Bank; Great South Channel
Harbor porpoise ( <i>Phocoena phocoena</i> )	Small and resident	July - September	Gulf of Maine
Fin whale ( <i>Balaenoptera physalus</i> )	Feeding	June - October	Northern Gulf of Maine