

<b>Data Collection</b> Habitat-based Cetacean Density Models for the U.S. Atlantic, prepared by the Marine-life Data and Analysis Team (MDAT)	
<b>Data Collection Title</b>	MDAT_WS_MAMMAL_MODEL_DATA_V2.0_2018_03_01
<b>Data Collection URL</b>	Map services: <a href="http://mgelmaps.env.duke.edu/mdat/rest/services/MDAT">http://mgelmaps.env.duke.edu/mdat/rest/services/MDAT</a>

<b>Data Set</b>	
<b>Data Set Title</b>	MDAT_WS_MAMMAL_MODEL_DATA_V2.0_2018_03_01
<b>Principal Investigators</b>	<p>MGEL Project: Jason J. Roberts, Laura Mannocci, Patrick N. Halpin - Marine Geospatial Ecology Lab at Duke University</p> <p>MDAT Project: Patrick N. Halpin (PI) - Marine Geospatial Ecology Lab at Duke University; Earvin Balderama (Co-I) - Loyola University Chicago; Michael Fogarty (Co-I) - NOAA/NEFSC; Arliss Winship (Co-I) - NOAA/NCCOS</p>
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<b>Collaborators</b>	<p>Data providers and model reviewers:            Ei Fujioka            Debra L. Palka            Lance P. Garrison            Keith D. Mullin            Timothy V.N. Cole            Christin B. Khan            William A. McLellan            D. Ann Pabst            Susan G. Barco            Timothy A. Gowan            Right Whale EWS Teams</p> <p>MDAT members:            Earvin Balderama (Co-I, Loyola University Chicago)            Jesse Cleary (Duke University)            Corrie Curtice (Duke University)            Michael Fogarty (Co-I, NOAA/NEFSC)            Patrick N. Halpin (PI, Duke University)            Brian Kinlan (NOAA/NCCOS)            Charles Perretti (NOAA/NEFSC)            Jason Roberts (Duke University)            Emily Shumchenia (NROC)            Arliss Winship (Co-I, NOAA/NCCOS)</p>
<b>Author List</b>	<p>Scientific Reports publication:            Jason J. Roberts<sup>1</sup>, Benjamin D. Best<sup>1,2</sup>, Laura Mannocci<sup>1</sup>, Ei Fujioka<sup>1</sup>, Patrick N. Halpin<sup>1</sup>, Debra L. Palka<sup>3</sup>, Lance P. Garrison<sup>4</sup>, Keith D. Mullin<sup>5</sup>, Timothy V. N. Cole<sup>3</sup>, Christin B. Khan<sup>3</sup>, William A. McLellan<sup>6</sup>, D. Ann Pabst<sup>6</sup> &amp; Gwen G. Lockhart<sup>7</sup></p> <p><sup>1</sup>Marine Geospatial Ecology Laboratory, Nicholas School of the Environment, Duke University, Durham, NC, USA.</p>

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Abstract	<p>In 2014, the Marine Geospatial Ecology Lab (MGEL) of Duke University began work with the Northeast Regional Ocean Council (NROC), the NOAA National Centers for Coastal Ocean Science (NCCOS), the NOAA Northeast Fisheries Science Center (NEFSC) and Loyola University Chicago, as part of the Marine-life Data and Analysis Team (MDAT), to characterize and map marine life in the Northeast region in support of the Regional Ocean Plan. In 2015, the Mid-Atlantic Regional Council on the Ocean (MARCO) contracted with MDAT to build upon and expand this effort into the Mid-Atlantic planning area, and in support of the Mid-Atlantic Regional Ocean Plan. These research groups collaborated to produce "base layer" predictive model products with associated uncertainty products for cetacean species or species guilds and avian species, and three geospatial products for fish species. Periodic updates to these base layer models and data are produced by the individual institutions in the MDAT team based on schedules set by the funders of each modeling effort.</p> <p>In 2017, MGEL updated the source data, covariates, and modeling methodology to produce new models for 11 cetacean species or species guilds, a subset of the previous set of models. An additional update for the remaining models is scheduled for Fall 2018.</p> <p>Prior to 2014, MDAT member MGEL developed habitat-based density models for marine mammals as part of the US Navy funded project "Habitat-based cetacean density models for the U.S. Atlantic and Gulf of Mexico."</p>

	<p>The publication, downloadable model results, and supplementary information can be found here:  <a href="http://seamap.env.duke.edu/models/Duke-EC-GOM-2015/">http://seamap.env.duke.edu/models/Duke-EC-GOM-2015/</a></p> <p>MDAT compiled the Atlantic habitat-based density model results and four products characterizing model uncertainty. The individual species maps represent the results of distance sampling modeling methodology applied to over 20 years of aerial and shipboard cetacean surveys, linked with remote sensing and ocean model environmental covariates. The models extend to the US EEZ boundary along the entire US Atlantic coast, and some model results extend into Canadian waters.</p> <p>The 95% and 5% Confidence Interval, the Coefficient of Variation, and Standard Error grids are provided as supporting statistical measures of model uncertainty.</p>
<p><b>Purpose</b></p>	<p>The MGEL model efforts were funded by the U.S. Navy and NASA. MGEL led this assessment to inform several concurrent processes:</p> <ol style="list-style-type: none"> <li>1. The renewable energy policy decisions in the Outer Continental Shelf (OCS) waters by the Bureau of Ocean Energy Management (BOEM)</li> <li>2. The Environmental Impact Statement by the U.S. Navy to assess the effects of training activities</li> <li>3. Re-assessment of the designated Critical Habitat areas for the North Atlantic right whale by the National Marine Fisheries Service (NMFS)</li> <li>4. Re-evaluation of the status of regional populations of humpback and Bryde's whales under the Endangered Species Act.</li> </ol> <p>MDAT incorporated the Atlantic models and uncertainty products into the products delivered to the Northeast and Mid-Atlantic (US) regional ocean portals and the national Marine Cadastre to inform ocean planning.</p>
<p><b>Methods</b></p>	<p>See Roberts et al. (2016, 2017).</p>
<p><b>Citations</b></p>	<p>MGEL publication:  Roberts J.J., Best B.D., Mannocci L., Fujioka E., Halpin P.N., Palka D.L., Garrison L.P., Mullin K.D., Cole T.V.N., Khan C.B., McLellan W.A., Pabst D.A. &amp; Lockhart G.G. 2016. Habitat-based cetacean density models for the U.S. Atlantic and Gulf of Mexico. <i>Scientific Reports</i> 6: 22615. doi: 10.1038/srep22615. Accessed at: <a href="http://www.nature.com/articles/srep22615">http://www.nature.com/articles/srep22615</a></p> <p>Roberts J.J., Mannocci L., Halpin P.N. 2017. Final Project Report: Marine Species Density Data Gap Assessments and Update for the AFTT Study Area, 2016-2017 (Opt. Year 1). Document version 1.4. Report prepared for Naval Facilities Engineering Command, Atlantic by the Duke University Marine Geospatial Ecology Lab, Durham, NC.</p> <p>MDAT:  Curtice, C., Cleary J., Shumchenia E., Halpin P.N. 2018. Marine-life Data and Analysis Team (MDAT) technical report on the methods and development of marine-life data to support regional ocean planning and management. Prepared on behalf of the Marine-life Data Analysis Team (MDAT). Accessed at: <a href="http://seamap.env.duke.edu/models/MDAT/MDAT-Technical-Report.pdf">http://seamap.env.duke.edu/models/MDAT/MDAT-Technical-Report.pdf</a>.</p>

<b>Data Start Date</b>	1992
<b>Data End Date</b>	2016
<b>Data Northern Boundary</b>	47.7 degrees N
<b>Data Southern Boundary</b>	22.9 degrees N
<b>Data Western Boundary</b>	82.5 degrees W
<b>Data Eastern Boundary</b>	55.0 degrees W
<b>Place Keywords</b>	North Atlantic Ocean
<b>Spatial Reference Information</b>	Type: Projected Geographic Coordinate Reference: GCS_WGS_1984 Projection: WGS_1984_Albers Well-Known Text: PROJCS["WGS_1984_Albers", GEOGCS["GCS_WGS_1984", DATUM["D_WGS_1984", SPHEROID["WGS_1984",6378137.0,298.257223563]], PRIMEM["Greenwich",0.0], UNIT["Degree",0.0174532925199433]], PROJECTION["Albers"], PARAMETER["false_easting",0.0], PARAMETER["false_northing",0.0], PARAMETER["central_meridian",-78.0], PARAMETER["standard_parallel_1",40.66666666666666], PARAMETER["standard_parallel_2",27.33333333333333], PARAMETER["latitude_of_origin",34.0], UNIT["Meter",1.0]]
<b>Spatial Representation Type</b>	Grid
<b>Datasets</b>	Listed in Table 5 of Curtice et al. (2018)
<b>Update Frequency</b>	Irregular
<b>Resource Provider</b>	Marine Geospatial Ecology Lab (MGEL) at Duke University ( <a href="mailto:marinelife_data@duke.edu">marinelife_data@duke.edu</a> ), on behalf of MDAT.
<b>Comment</b>	<i>This data documentation describes numerous geospatial datasets archived together as a data collection, and is intended to provide dataset-level metadata for the purposes of discovery, use, and understanding.</i>
<b>Use Limitation</b>	<i>This dataset is copyright 2017 by the Marine Geospatial Ecology Lab at Duke University and licensed under a Creative Commons Attribution 4.0 International License (CC-BY) (<a href="http://creativecommons.org/licenses/by/4.0/">http://creativecommons.org/licenses/by/4.0/</a>). If you use this dataset in a scientific publication or other formal publication, we request that you cite the Roberts et al. (2016, 2017) and Curtice et al. (2018) publications.</i>