Data Collection Summary Products for Habitat-based Cetacean Density Models for the U.S. Atlantic, prepared by the Marine-life Data and Analysis Team (MDAT)	
Data Collection Title	MDAT_WS_MAMMAL_SUMMARY_PRODUCTS November 2023, v3.2
Data Collection URL	Map services: https://mgelmaps.env.duke.edu/mdat/rest/services/MDAT

Data Set	
Data Set Title	MDAT_WS_MAMMAL_SUMMARY_PRODUCTS November 2023, v3.2
Principal Investigators	MDAT Project: Patrick N. Halpin (PI) – Marine Geospatial Ecology Lab at Duke University; Michael Fogarty (Co-I) - NOAA/NEFSC; Arliss Winship (Co-I) - NOAA/NCCOS MGEL Project: Jason J. Roberts, Laura Mannocci, Robert S. Schick, Patrick N. Halpin – Marine Geospatial Ecology Lab at Duke University
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Navy 2023 Phase IV model report:

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Abstract

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) and the NOAA Northeast Fisheries Science Center (NEFSC),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.

Because base layers total in the thousands, efforts to develop a general understanding of the overall richness or diversity in a particular area are not well served by the individual base products. To address this gap and other potential management applications as identified by the NE RPB and others, MDAT has created several types of summary map products from these base layers. Summary products are comprised of data layers from multiple species, and were created to allow quick access to map summaries about potential biological, management, or sensitivity *groups* of interest. These summary products include total abundance or biomass, species richness, and diversity for all modeled/sampled groups of species and are useful tools for seeing broad patterns in the underlying data or model results.

An additional map product was created to highlight the core areas of highest abundance or biomass by species groups, using a 50% population threshold. Group core area richness maps aid users in identifying the "hotspots" of where certain groups of species have the highest abundance or biomass. Core area richness maps were created for three spatial extents: 1) the full US east coast; 2) the Northeast planning area and 3) the Mid-Atlantic area of interest. Because these products are dependent on the total extent of the

	input data, core area abundance/biomass products will differ at each extent.
Purpose	MDAT produced group summary products and delivered them to the Northeast and Mid-Atlantic (US) regional ocean portals and the Marine Cadastre National Viewer to inform ocean planning. All summary products are also available to the public via map services.
Methods	See Curtice et al. (2019) Section 3. 2018 v2.0 Update: v2.0 updates the group diversity and species richness products. Prior to group diversity and richness calculations, each individual species layer was pre-filtered to contain only the cells that are included in the area holding 95% of the total predicted abundance for the species. In addition, individual species models that are stratified density (vs habitat-based density) models are excluded from all group summary products. 2019 v2.1 Update: No methods were updated for this release. 2022 v2.2 Update: No methods were updated for this release. 2023 March v3.0 Update: No methods were updated for this release, but the base layer models for every species or species guild was updated with new modeling methods and data. 2023 June v3.1 Update: No methods were updated for this release. 2023 November v3.2 Update: Prior to group diversity and richness calculations, each individual species layer was pre-filtered to contain only the cells that are included in the area holding 99% of the total predicted abundance for the species.
Citations	MDAT Technical Report: Curtice, C., Cleary J., Shumchenia E., Halpin P.N. 2019. 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: http://seamap.env.duke.edu/models/MDAT/MDAT-Technical-Report.pdf. MGEL publications on cetacean individual species models: Roberts J.J., Yack T.M., Halpin P.N. 2023. Marine mammal density models for the U.S. Navy Atlantic Fleet Training and Testing (AFTT) study area for the Phase IV Navy Marine Species Density Database (NMSDD). Document version 1.2. Report prepared for Naval Facilities Engineering Systems Command, Atlantic by the Duke University Marine Geospatial Ecology Lab, Durham, North Carolina. 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. & Lockhart G.G. 2016. Habitat-based cetacean density models for the U.S. Atlantic and Gulf of Mexico. Scientific Reports 6: 22615. doi: 10.1038/srep22615. Accessed at: http://www.nature.com/articles/srep22615
Data Start Date	1998
Data End Date	2020

Data Northern Boundary	47.7 degrees N
Data Southern Boundary	22.9 degrees N
Data Western Boundary	82.5 degrees W
Data Eastern Boundary	55.0 degrees W
Place Keywords	North Atlantic Ocean
Spatial Reference Information	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]]
Spatial Representation Type	Grid
Datasets	Listed in Tables 4 and 6 of Roberts et al. (2023)
Update Frequency	Irregular
Resource Provider	*Marine Geospatial Ecology Lab (MGEL) at Duke University (marinelife_data@duke.edu), on behalf of MDAT.*
Comment	*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.*
Use Limitation	*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) (http://creativecommons.org/licenses/by/4.0/). If you use this dataset in a scientific publication or other formal publication, we request that you cite the Roberts et al. (2016, 2023) and Curtice et al. (2019) publications.*