Data Collection Chlorophyll-a Concentration (MDAT)	
Data Collection Title	MDAT_WS_Chlorophyll_a_Concentration v1.0
Data Collection URL	Map services: https://mgelmaps.env.duke.edu/mdat/rest/services/MDAT

Data Set	
Data Set Title	MDAT_WS_Chlorophyll_a_Concentration v1.0
Principal Investigators	Moderate-resolution Imaging Spectro-radiometer (MODIS): National Aeronautics and Space Administration (NASA) Visible Infrared Imaging Radiometer Suite (VIIRS): National Oceanic and Atmospheric Administration (NOAA) Ocean Colour Climate Change Initiative (OC-CCI): European Space Agency (ESA) MDAT Project: Patrick N. Halpin (PI) – Marine Geospatial Ecology Lab at Duke University
Primary Points of Contact	MDAT Collection: marinelife_data@duke.edu - Marine Geospatial Ecology Lab at Duke University
Author List	MDAT: Sarah DeLand[1], Ei Fujioka[2], Ben Donnelly[2], Corrie Curtice[1], Jesse Cleary[2], Deborah Brill[2], Emily Shumchenia[3], Nick Napoli[3], Patrick Halpin[2] [1] Marine Geospatial Ecology Laboratory, Duke University Marine Lab, Beaufort, NC, US [2] Marine Geospatial Ecology Laboratory, Duke University, Durham, NC, US [3] Northeast Regional Ocean Council, US
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.
Purpose	The Chlorophyll-a concentration layers were originally developed by Marta Ribera of The Nature Conservancy in 2016. MGEL led this update to meet several goals: 1. To update the data on the Northeast and Mid-Atlantic data portals with more recent data.

	2. To update the data sources with sensors that will continue to be available for future dataset updates. 3. Increase the temporal resolution of Chlorophyll-a data from seasonal to monthly.
Methods	MODIS and VIIRS methods: Daily MODIS Aqua and VIIRS Chlorophyll-a layers were downloaded via NASA Earth Access. Data were processed into monthly median climatologies using SEADAS version 9.2. Data from VIIRS SUOMI-NPP and VIIRS NOAA-20 were processed together. The spatial resolution was set as 1.3km and values flagged as inaccurate or over land by NASA were removed (see this link for the flags NASA applies: https://oceancolor.gsfc.nasa.gov/resources/atbd/ocl2flags/). Pixels in water shallower than 10 meters and in rivers or lakes were removed. OC-CCI methods: Daily Chlorophyll-a data were downloaded via Ocean Colour version 6.0 at a spatial resolution of 1 km. These daily composites have been processed by Ocean Colour to integrate multiple sensors and algorithms. Monthly median climatologies were created in Python using the Xarray package. Pixels in water shallower than 10 meters and in rivers or lakes were removed. 2010 - 2019 MODIS Aqua 2020 – 2024 VIIRS OC-CCI These methods were adapted from Ribera (2016) and updated following recommendations provided by the Regional Wildlife Science Collaborative (RWSC) Habitat and Ecosystem Subcommittee.
Citations	MODIS: NASA Goddard Space Flight Center, Ocean Ecology Laboratory, Ocean Biology Processing Group. Moderate-resolution Imaging Spectroradiometer (MODIS) Aqua Level-2 Ocean Color Data; NASA OB.DAAC, Greenbelt, MD, USA. doi: 10.5067/AQUA/MODIS/L2/OC/2022.0. VIIRS: Suomi-NPP VIIRS Level-2 Regional Ocean Color (OC) Data, version 2022.0 doi: 10.5067/SUOMI-NPP/VIIRS/L2/OC/2022.0 NOAA-20 VIIRS Level-2 Regional Ocean Color (OC) Data, version 2022.0 doi: 10.5067/NOAA-20/VIIRS/L2/OC/2022.0 OC-CCI: Sathyendranath, S, Brewin, RJW, Brockmann, C, Brotas, V, Calton, B, Chuprin, A, Cipollini, P, Couto, AB, Dingle, J, Doerffer, R, Donlon, C, Dowell, M, Farman, A, Grant, M, Groom, S, Horseman, A, Jackson, T, Krasemann, H, Lavender, S, Martinez-Vicente, V, Mazeran, C, Mélin, F, Moore, TS, Mu¨ller, D, Regner, P, Roy, S, Steele, CJ, Steinmetz, F, Swinton, J, Taberner, M, Thompson, A, Valente, A, Zu¨hlke, M, Brando, VE, Feng, H, Feldman, G, Franz, BA, Frouin, R, Gould, Jr., RW, Hooker, SB, Kahru, M, Kratzer, S, Mitchell, BG, Muller-Karger, F, Sosik, HM, Voss, KJ, Werdell, J, and Platt, T (2019) An ocean-colour

	time series for use in climate studies: the experience of the Ocean-Colour Climate Change Initiative (OC-CCI). Sensors: 19, 4285. doi:10.3390/s19194285 Original Methods: Ribera, M (2016). Median surface chlorophyll-a concentration 2003-2015. The Nature Conservancy. https://easterndivision.s3.amazonaws.com/Marine/MooreGrant/ChlorophyllaMedian20032015.pdf MDAT: 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.
Data Start Date	2010
Data End Date	2024
Data Northern Boundary	46.0 degrees N
Data Southern Boundary	35.0 degrees N
Data Western Boundary	77.0 degrees W
Data Eastern Boundary	61.0 degrees W
Place Keywords	North Atlantic Ocean
Spatial Reference Information	Type: Projected Geographic Coordinate Reference: WGS 1984 Projection: WGS_1984_Web_Mercator_Auxiliary_Sphere Well-Known Text: GEOGCS["WGS 84", DATUM["WGS_1984", SPHEROID["WGS 84",6378137,298.257223563, AUTHORITY["EPSG","7030"]], AUTHORITY["EPSG","6326"]], PRIMEM["Greenwich",0, AUTHORITY["EPSG","8901"]], UNIT["degree",0.0174532925199433, AUTHORITY["EPSG","9122"]], AUTHORITY["EPSG","4326"]], PROJECTION["Mercator_1SP"], PARAMETER["central_meridian",0], PARAMETER["scale_factor",1], PARAMETER["false_easting",0], PARAMETER["false_northing",0], UNIT["metre",1, AUTHORITY["EPSG","9001"]], AUTHORITY["ESRI","102100"]]
Spatial Representation Type	Grid
Datasets	MODIS: NASA Goddard Space Flight Center, Ocean Ecology Laboratory, Ocean Biology Processing Group. Moderate-resolution Imaging Spectroradiometer (MODIS) Aqua Level-2 Ocean Color Data; NASA OB.DAAC, Greenbelt, MD, USA. doi: 10.5067/AQUA/MODIS/L2/OC/2022.0. VIIRS:

	Suomi-NPP VIIRS Level-2 Regional Ocean Color (OC) Data, version 2022.0 doi: 10.5067/SUOMI-NPP/VIIRS/L2/OC/2022.0 NOAA-20 VIIRS Level-2 Regional Ocean Color (OC) Data, version 2022.0 doi: 10.5067/NOAA-20/VIIRS/L2/OC/2022.0 OC-CCI: Sathyendranath, S, Brewin, RJW, Brockmann, C, Brotas, V, Calton, B, Chuprin, A, Cipollini, P, Couto, AB, Dingle, J, Doerffer, R, Donlon, C, Dowell, M, Farman, A, Grant, M, Groom, S, Horseman, A, Jackson, T, Krasemann, H, Lavender, S, Martinez-Vicente, V, Mazeran, C, Mélin, F, Moore, TS, Mu¨ller, D, Regner, P, Roy, S, Steele, CJ, Steinmetz, F, Swinton, J, Taberner, M, Thompson, A, Valente, A, Zu¨hlke, M, Brando, VE, Feng, H, Feldman, G, Franz, BA, Frouin, R, Gould, Jr., RW, Hooker, SB, Kahru, M, Kratzer, S, Mitchell, BG, Muller-Karger, F, Sosik, HM, Voss, KJ, Werdell, J, and Platt, T (2019) An ocean-colour time series for use in climate studies: the experience of the Ocean-Colour Climate Change Initiative (OC-CCI). Sensors: 19, 4285. doi:10.3390/s19194285
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 Curtice et al. (2019) publications.*