NOx emissions in European shipping areas in 2019, Mar. 2021

This metadata refers to the map showing the NOx emissions from ships in European shipping areas (calculated as NO2) during the year 2019. The numerical values reported in the map are kilograms of NOx per grid cell area.

NOx emissions cause or add to regional problems, including acidrain and health problems in local areas such as harbours.NOx contribute to eutrophication, caused by excessive amounts of nutrient nitrogen and which can disrupt terrestrial and aquatic ecosystems. NO2 is also a precursor gas, forming new particles in the air or condensing on to pre-existing particles to form secondary PM (i.e. secondary inorganic aerosols)

The dataset has been prepared in the context of the development of the first European Maritime Transport Environmental Report (EMSA-EEA report, 2021: https://www.eea.europa.eu /publications/maritime-transport).

Simple

Date (Creation)	2021-03-15
Date (Publication)	2021-03-31
Edition	01.00
Citation identifier	eea_r_3035_10_km_emter-NOx-2019_p_2019_v01_r00

Point of contact	Organisation name	Individual name	Electronic mail address	Website	Role
	European Environment Agency		sdi@eea. europa.eu	http://www. eea. europa.eu	Point of contact

Point of contact

No information provided.

Point of contact

No information provided.

Maintenance and update frequency	Unknown
GEMET - INSPIRE themes, version 1.0	• Transport networks • Atmospheric conditions
Keywords	
Keywords	
GEMET	• environment • ocean • sea • environmental quality • nitrogen dioxide • transportation • marine environment • maritime transport • emission

	• air pollution
	• environmental impact of transport
	• nitrogen oxide
	• marine pollution
	• ship
Continents, countries, sea regions of the world.	• Northeast Atlantic Ocean (40W)
	• Mediterranean Sea
	• North Sea
	• Kattegat
	• Ionian Sea
	• Iceland Sea
	• English Channel
	• Adriatic Sea
	• Barents Sea
	• Black Sea
	• Baltic Sea
	• Bay of Biscay
	• Celtic Sea
	• Norwegian Sea
Spatial scope	• European
EEA topics	• Air pollution
	• Seas and coasts
	• Transport and mobility
Access constraints	Other restrictions
Other constraints	no limitations to public access
Use constraints	Other restrictions
Other constraints	EEA standard re-use policy: unless otherwise indicated, re-use of content on the EEA website for commercial or non-commercial purposes is permitted free of charge, provided that the source is acknowledged (http://www.eea.europa.eu/legal/copyright). Copyright holder: European Environment Agency (EEA).
Aggregate Datasetindentifier	22ad5ddf-967d-4ce7-9933-f7ac89e0b638
Association Type	Cross reference
Aggregate Datasetindentifier	5b83a3ca-2545-4b9e-a294-e709be063059
Association Type	Cross reference
Aggregate Datasetindentifier	9e5d71d4-de26-4abd-ab34-004e7d2d3fb9
Association Type	Cross reference
Spatial representation type	Grid
Distance	10 km

Language of dataset	English
Topic category	- Environment - Oceans - Transportation

Begin date	2019-01-01
End date	2019-12-31
Coordinate reference system identifier	EPSG:3035
Distribution format	• netCDF ( )

OnLine resource	Protocol	Linkage	Name
	EEA:FOLDERPATH	https://sdi.eea.europa.eu/webdav/datastore/public/eea_r_3035_10_km_emter-NOx-2019_p_2019_v01_r00/GDB/	
	WWW:URL	https://sdi.eea.europa.eu/data/f26cefae-6996-4c59-84de-2988fb1282da	Direct download
	ESRI:REST	https://water.discomap.eea.europa.eu/arcgis/rest/services/Marine/Shipping_emissions_NOx_2019/MapServer	
	OGC:WMS	https://water.discomap.eea.europa.eu/arcgis/services/Marine/Shipping_emissions_NOx_2019/MapServer/WMSServer?request=GetCapabilities&service=WMS	

Hierarchy level	Dataset

Conformance result

Date (Publication)	2010-12-08
Explanation	See the referenced specification

| Statement | The dataset covers IHO sea regions inside the bounding box (excluding the Red Sea): Mediterranean Sea, Atlantic Ocean, North Sea, Baltic Sea, English Channel, Irish & British Seas, Black Sea, Norwegian Sea, Bay of Biscay, Arctic Ocean, Sea of Azov, Greenland Sea.

This data was generated with STEAM ship emission model. The data reports the annual sums of ship emitted pollution to air/water/underwater noise. The variables included in this dataset are: Antifouling paint (CuO) release to water, Antifouling paint (CuPyr) release to water, Antifouling paint (DCOIT) release to water, Antifouling paint (Zineb) release to water, Antifouling paint (ZnO) release to water, Antifouling paint (ZnPyr) release to water, Ash emissions to air, Ballast water dicharges to the sea, Bilge water discharge to the sea, Carbon monoxide (CO) emissions to air, Carbon dioxide (CO_2) emissions to air, Elementary carbon (EC) emissions to air, Grey water (GW) discharge to water, Heavy Fuel Oil (HFO) used in ships, Liquid Natural Gas (LNG) used in ships, Marine Diesel Oil (MDO) used in ships, Number of Automatic Identification System (AIS) messages received, Marine Gas Oil (MGO) used in ships, Foodwaste nitrogen released to water, Sewage nitrogen released to water, Underwater noise energy released to water (63 Hz 1/3 octave band), Underwater noise energy released to water (125 Hz 1/3 octave band), Underwater noise energy released to water (2000 Hz 1/3 octave band), Nitrogen oxide (NOx) emissions to air, Organic carbon (OC) emissions to air, Transport work (Payload) done by ships, Number |
| --- | --- |

of person days spent onboard ships, Particulate matter (PM, smaller than 2.5 micrometers) emissions to air, Particle number emissions to air, Closed loop scrubber effluent release to water, Open loop scrubber effluent release to water, Sewage discharge to water, Sulphate (SO4) emissions to air, Sulphur oxide (SOx) emissions to air, Stern tube oil release to sea, Non-methane volatile organic compound (VOC) emissions to air.

These data are based on global AIS data from Orbcomm Ltd, IHS Markit ship fleet description and FMI STEAM ship model. Technical references for the STEAM model:

Jalkanen, J.-P. P., Brink, A., Kalli, J., Pettersson, H., Kukkonen, J., Stipa, T., … Stipa, T. (2009). A modelling system for the exhaust emissions of marine traffic and its application in the Baltic Sea area. Atmos. Chem. Phys., 9(4), 9209–9223. https://doi.org/10.5194/acp-9-9209-2009

Jalkanen, J. P., Johansson, L., Kukkonen, J., Brink, A., Kalli, J., & Stipa, T. (2012). Extension of an assessment model of ship traffic exhaust emissions for particulate matter and carbon monoxide. Atmospheric Chemistry and Physics, 12(5), 2641–2659. https://doi.org/10.5194/acp-12-2641-20 12

Johansson, L., Jalkanen, J.-P., Kalli, J., & Kukkonen, J. (2013). The evolution of shipping emissions and the costs of regulation changes in the northern EU area. Atmospheric Chemistry and Physics, 13(22), 11375–11389. https://doi.org/10.5194/acp-13-11375-20 13

Johansson, L., Jalkanen, J.-P., & Kukkonen, J. (2017). Global assessment of shipping emissions in 2015 on a high spatial and temporal resolution. Atmospheric Environment, 167, 403–415. https://doi.org/10.1016/j.atmosenv.2017.08.04 2

Jalkanen, J.-P., Johansson, L., Liefvendahl, M., Bensow, R., Sigray, P., Östberg, M., … Pajala, J. (2018). Modelling of ships as a source of underwater noise. Ocean Science, 14(6), 1373–1383. https://doi.org/10.5194/os-14-1373-2018

Jalkanen, J.-P., Johansson, L., Wilewska-Bien, M., Granhag, L., Ytreberg, E., Eriksson, K.M., Yngsell, D., Hassellöv, I.-M., Magnusson, K., Raudsepp, U., Maljutenko, I., Styhre, L., Winnes, H., Moldanova J. (2020). Modeling of discharges from Baltic Sea shipping, Ocean Science Discussions, https://doi.org/10.5194/os-2020-99, in review

The dataset has been prepared in the context of developing the first European Maritime Transport Environmental Report (EMSA-EEA report, 2021: https://www.eea.europa.eu/publications/maritime-transport).

Metadata

File identifier	f26cefae-6996-4c59-84de-2988fb1282da XML
Metadata language	English
Character set	UTF8
Hierarchy level	Dataset
Date stamp	2023-01-03T08:19:07.264Z
Metadata standard name	ISO 19115/19139
Metadata standard version	1.0
Metadata author	

Organisation name	Individual name	Electronic mail address	Website	Role
European Environment Agency		sdi@eea.europa.eu		Point of contact

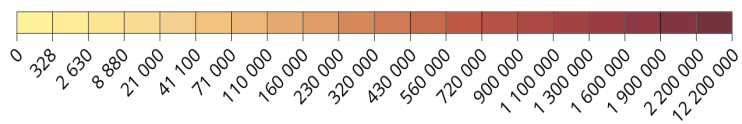## Overviews
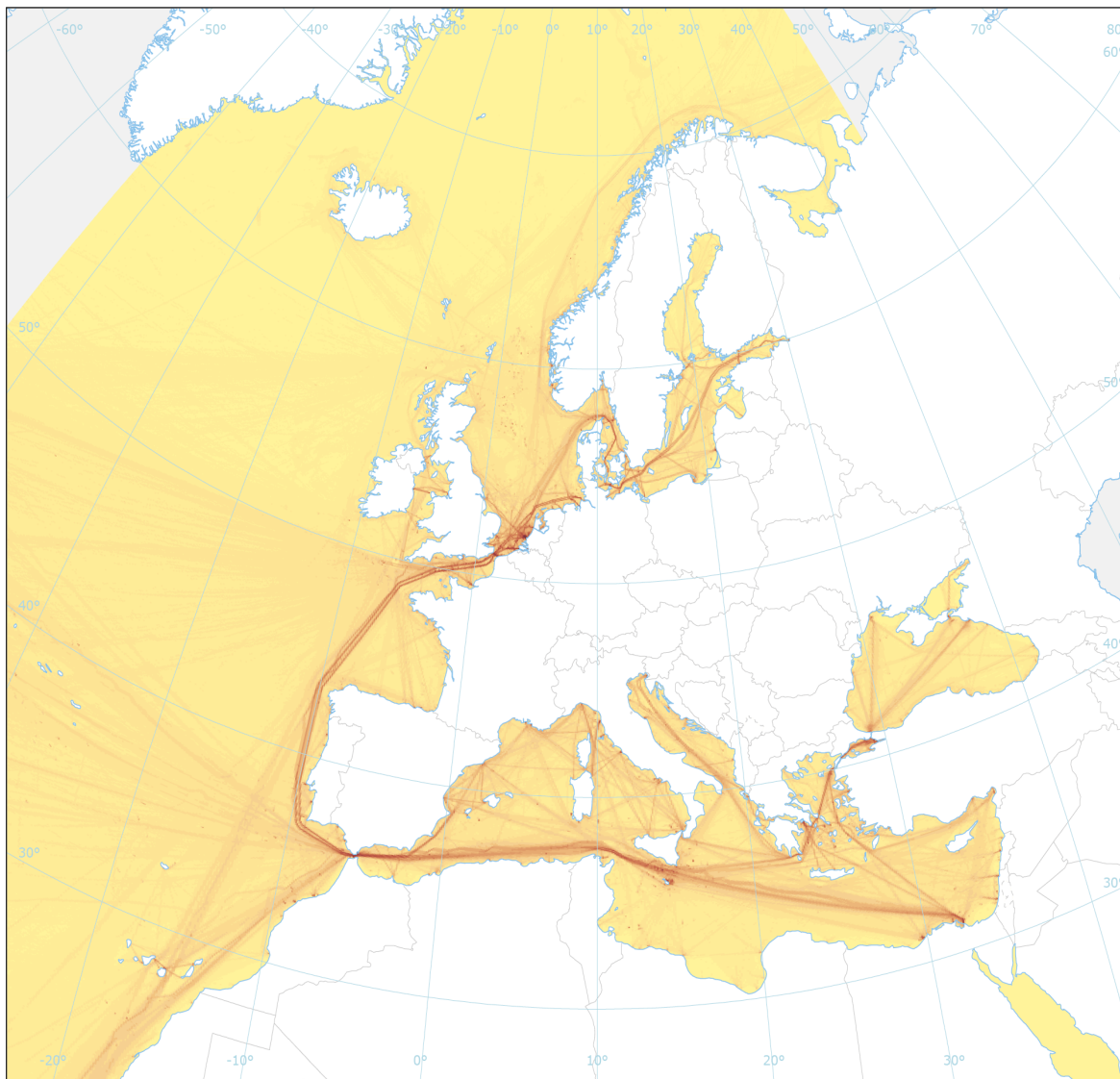
Reference data: ©ESRI

2019 NO$_x$ emissions from ships in the European Seas

Kg of NO$_x$ per grid cell area

| 0 | 328 | 2 630 | 8 880 | 21 000 | 41 100 | 71 000 | 110 000 | 160 000 | 230 000 | 320 000 | 430 000 | 560 000 | 720 000 | 900 000 | 1 100 000 | 1 300 000 | 1 600 000 | 1 900 000 | 2 200 000 | 12 200 000 |

0   500   1 000   1 500 km

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