

ASTD DATA

INFORMATION DOCUMENT



PAME

Protection of the Arctic Marine Environment



ASTD DATA DOCUMENT

The *Cooperative Agreement among the Arctic States Regarding Arctic Ship Traffic Data Sharing* outlines access to the Arctic Ship Traffic Data (ASTD) Program and the use of ASTD data.

This document outlines and explains the ASTD data.

The document is intended for all ASTD users.

Questions can be sent to the PAME Secretariat (pame@pame.is)

ASTD Data Document Version History

1.1: January 2019

1.2: April 2020

1.3: January 2021

1.4: March 2021

1.5: November 2022

1.6: January 2023

1.7: March 2023

1.8: September 2023

1.9: September 2024

1.10: September 2025

1.11: October 2025

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Geographic Scope

Data in ASTD is collected from satellites and base stations provided by USA, Norway and Iceland. Data is collected from a defined area, shown on the map to the right.

The area was chosen to include all EEZ of Arctic States, the Arctic Search and Rescue Areas, definitions of the Arctic by other Arctic Council Working Groups and other important Arctic defined areas.



ASTD Data

The ASTD Program data can be accessed by two means:

ASTD SYSTEM

- ✓ Easy access to data
- ✓ Quick analysis on pre-defined areas
- ✓ Easily add own areas for analysis
- ✓ Data is pre-calculated for each ship per month
- ✓ Simple to use

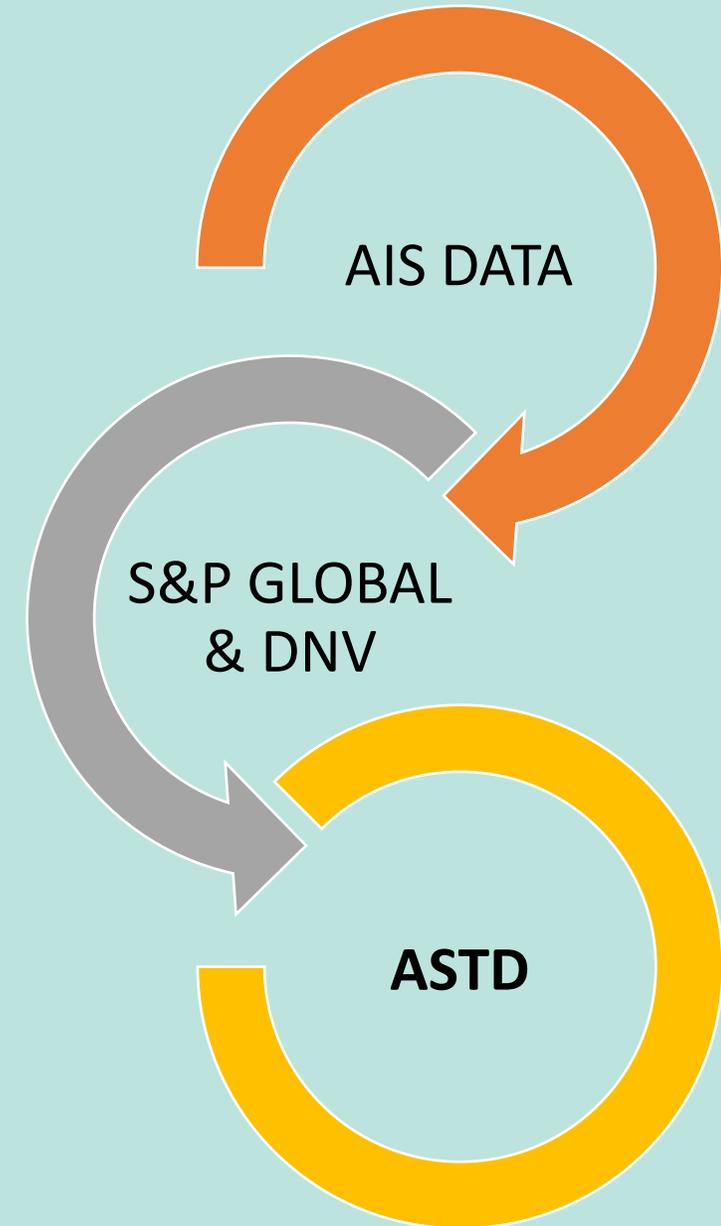
FTP SERVER

- ✓ Data in aggregated files for the whole ASTD area
- ✓ Data needs to be filtered, cleaned and processed from scratch
- ✓ Requires GIS expertise
- ✓ Slightly more details in data
- ✓ Intended for specific analysis
- ✓ ASTD users contact PAME Secretariat for access

ASTD DATA

The ASTD Program contains four types of information. These are:

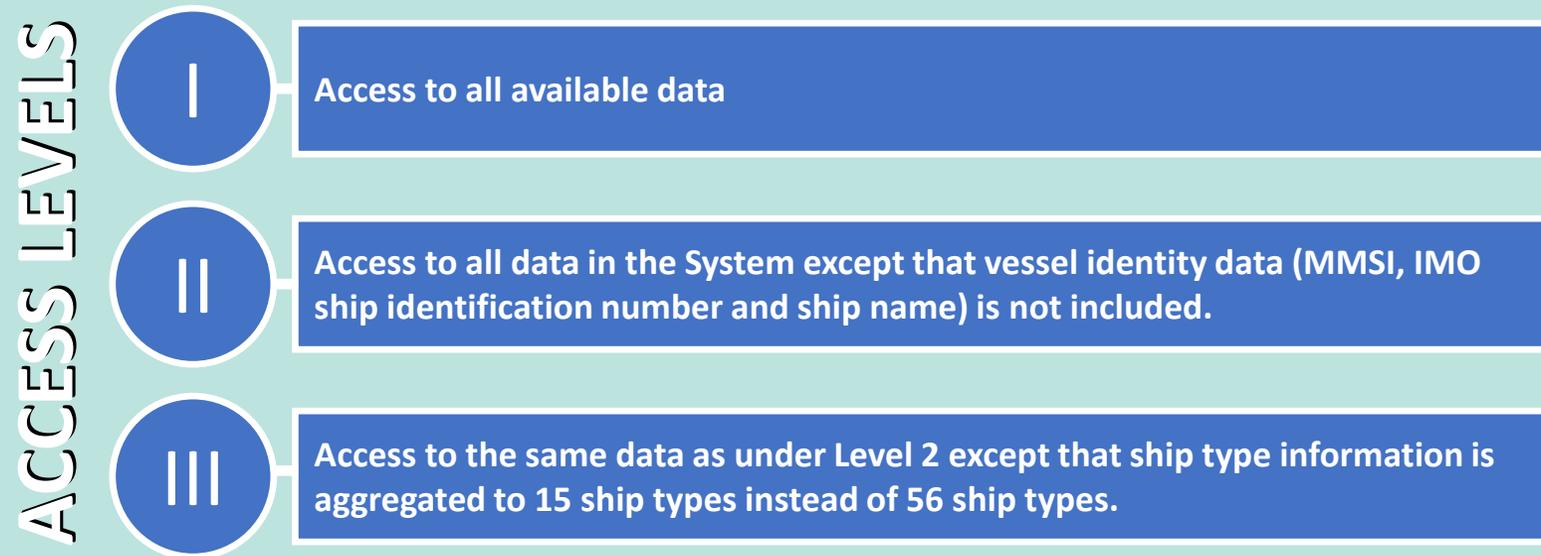
1. Automatic Identification System (AIS data) received from ships operating in the Arctic. This data is collected by satellites and base stations. It is provided by USA, Norway and Iceland.
2. Ship characteristic information (e.g., type, size, flag, gross tonnage) from S&P Global (formerly IHS Markit, which had acquired Lloyds Register in 2009). Lloyds Register had collected information on ships since 1790. On behalf of IMO, S&P Global hosts a ship information database and is the sole issuer of IMO numbers. An IMO number is a unique number assigned to each ship. The IMO ship identification number scheme was introduced in 1987 as a measure to enhance ship safety and security. It established a mechanism for assigning a permanent number to each ship for identification purposes. That number remains unchanged through the ship's life. From this, information in the tables on page 7 and 9 is generated.
3. Information on the types of fuel ships are burning and calculated air emissions from such combustion are obtained from DNV. DNV makes these calculations based on IMO emission factors. DNV is the world's largest classification society and a recognized advisor to the maritime industry. See pages 19-20 & 22.
4. Sea ice data from the U.S. National Snow and Ice Data Center (NSIDC). ASTD contains monthly sea ice extent information obtained from the [NSIDC Sea Ice Index](#). The edge is smoothed for visual purposes using the following script:
`ST_ChaikinSmoothing(ST_SimplifyPreserveTopology(wkb_geometry,20000),2)`



ASTD DATA – ACCESS LEVELS

Arctic State approved government agencies and ministries, Arctic Council Permanent Participants and Arctic Council Working Groups get free access to the database. Others, such as Arctic Council Observers, pay a small fee for access to ASTD. Information on these specifics are available in the ASTD Application form – available on www.astd.is.

Access to ASTD data may be granted to eligible applicants at one of three access levels:
Level I, Level II and Level III



See tables on pages 7 & 9 what is included in the ASTD Data for each access level.

ASTD SYSTEM

The table shows data fields for each ship in the ASTD System and compares each access level. The fields are acquired by downloading data from the ASTD System.

See example of how the data looks when downloaded on page 8.

DATA FIELD IN ASTD DATA	LEVEL 1	LEVEL 2	LEVEL 3	EXPLANATION	PAGE
period	YES	YES	YES	Month and year chosen	-
area_type	YES	YES	YES	Type of area chosen (EEZ, LME etc.)	-
area_id	YES	YES	YES	Number if this area in the ASTD Database	-
Ship_id	NO	YES	YES	Ship identification number.	11
mmsi	YES	NO	NO	The identification number of the AIS-equipment on the vessel	11
imonumber	YES	NO	NO	IMO number of the ship	11
fishingvesselnumber	YES	NO	NO	Registration for fishing vessels	11
vesselname	YES	NO	NO	Name of ship	11
flagcode	YES	YES	YES	Flag Code for the ship	12
iceclass	YES	YES	YES	Ice Class for the ship	13
norwegianshiptypeid	YES	YES	YES	Type of ship id (ASTD)	14-16
norwegianshiptypename	YES	YES	YES	Type of ship (ASTD)	14-16
lloydsshiptypeid	YES	YES	NO	Type of ship id (Lloyds)	14-16
lloydsshiptypename	YES	YES	NO	Type of ship (Lloyds)	14-16
lloyds5_cat	YES	NO	NO	Type of ship id (Lloyds)	14-16
yearofbuild	YES	YES	YES	Year which a vessel was delivered to its original owner by a shipbuilder.	-
deadweight	YES	YES	NO	DWT of the ship,	17
draught	YES	YES	NO	Draught of the ship	17
lengthregistered	YES	YES	NO	Length of the ship	17
passengercapacity	YES	YES	NO	Maximum passenger capacity	17
grosstonnage	YES	YES	NO	GT of the ship	17
vesselsizedescription	YES	YES	YES	Vessel size category	17
fuelquality	YES	YES	YES	Type of fuel used	18-19
distance_nm	YES	YES	YES	Distance sailed in nautical miles	20
consumption	YES	YES	YES	Fuel consumption in metric tons	18-19
co2emission	YES	YES	YES	Co2 emission of the ship in metric tons	21
coemission	YES	YES	YES	CoE emission of the ship in metric tons	21
noxemission	YES	YES	YES	NOX emission of the ship in metric tons	21
so2emission	YES	YES	YES	So2 emission of the ship in metric tons	21
operationhour	YES	YES	YES	Hours operated	22
arcticshiptypeid	YES	YES	YES	ID for Arctic ship types	
arcticshiptype	YES	YES	YES	Ship types representative for the Arctic	

ASTD SYSTEM: DATA DOWNLOAD FUNCTION – LEVEL 1

The example shows a part of ships in the Polar Code area in March 2023.

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB	AC	
period	area_type	area_id	mmsi	imnumber	fishingvesselnumber	vesselname	flagcode	iceclass	norwegianshiptypeid	norwegianshiptypename	lloydshiptyeid	lloydshiptyename	lloyds_cat	yearofbuild	deadweight	draught	lengthregistered	passengercapacity	gross tonnage	vesselsizedescription	fuelquality	distance_nm	consumption	co2emission	coemission	noxemission	so2emission	operationhour	
2023-03	polarcode	1	273379890	8711306		ANDREY OSIPOV	RUS	FS Ice Class 1A Super	5	General cargo ships	A31	General Cargo	A31A2GX	1994	7346	6.880000114	0	0	7085	5000 - 9999 GT	6	832.2724914	84.44921599	266.9381169	0.512577706	3.238342484	0.354686709	670.0091667	
2023-03	polarcode	1	273327220	8801632		BILIBINO	RUS	FS Ice Class 1A	5	General cargo ships	A31	General Cargo	A31A2GX	1989	9590	8.541000366	106.4199982	0	6030	5000 - 9999 GT	6	19.82699089	31.10848582	98.25613304	0.159108983	0.925907956	1.306556441	358.0722222	
2023-03	polarcode	1	273218890	9368340		MYS DEZHNEVA	RUS	FS Ice Class 1A	5	General cargo ships	A31	General Cargo	A31A2GX	2008	17349	9.689999958	133.3600006	0	11835	10000 - 24999	6	1233.719158	86.69457186	274.6266268	0.637336143	6.438240461	0.364117201	141.1466667	
2023-03	polarcode	1	273382350	9014896		NIKIFOR BEGICHEV	RUS	FS Ice Class 1A	5	General cargo ships	A31	General Cargo	A31A2GX	1991	12150	8.609999657	124.9899979	0	7949	5000 - 9999 GT	6	1438.276755	88.77831722	280.9690431	0.604031488	4.076029911	0.372868936	495.7980556	
2023-03	polarcode	1	273359470	8912974		VALERI VASILIEV	RUS	FS Ice Class 1A	5	General cargo ships	A31	General Cargo	A31A2GX	1991	13565	8.189999958	0	0	10374	10000 - 24999	6	1865.214298	109.5091533	346.754911	0.794330013	7.740822567	0.459938444	311.4461111	
2023-03	polarcode	1	273437510	9267297		BERING	RUS	FS Ice Class 1A	5	General cargo ships	A31	General Cargo	A31A2GX	2003	10649	7.673999786	0	0	7737	5000 - 9999 GT	6	576.4596274	25.65720632	81.295356	0.189863327	1.341799646	0.107760266	49.88888889	
2023-03	polarcode	1	219027854	9854636		SUANA ARCTICA	DIS	FS Ice Class 1A Super	5	General cargo ships	A31	General Cargo	A31A2GX	2020	2300	5.699999809	62.40000153	0	2613	1000 - 4999 GT	6	920.9318861	44.8426176	141.7777201	0.331835369	1.988224877	0.188338994	742.9891667	
2023-03	polarcode	1	219027908	9854648		MALERAQ ARCTICA	DIS	FS Ice Class 1A Super	5	General cargo ships	A31	General Cargo	A31A2GX	2021	2300	5.699999809	62.40000153	0	2613	1000 - 4999 GT	6	684.1032781	0						
2023-03	polarcode	1	273326150	8502119		ERMAK	RUS	FS Ice Class 1A Super	5	General cargo ships	A31	General Cargo	A31A2GX	1998	7049	7	122.5500031	0	6418	5000 - 9999 GT	6	2482.842096	143.439136	454.1850391	1.004587354	6.914539305	0.602444371	558.7341667	
2023-03	polarcode	1	273218690	9368338		YAMAL BERKUT	RUS	FS Ice Class 1A	5	General cargo ships	A31	General Cargo	A31A2GX	2008	17158	9.689999958	0	0	11825	10000 - 24999	6	1141.073989	156.8722361	496.0189948	1.038763579	8.593365312	0.658863393	724.49	
2023-03	polarcode	1	273216130	9366110		MYS ZHELANIYA	RUS	FS Ice Class 1A	5	General cargo ships	A31	General Cargo	A31A2GX	2008	17300	9.710000038	133.3600006	0	11864	10000 - 24999	6	3346.52176	228.9072085	724.6821109	1.644950378	15.73654608	0.961410276	585.0605556	
2023-03	polarcode	1	273211090	9081291		TERIBERKA	RUS	FS Ice Class 1A	5	General cargo ships	A31	General Cargo	A31A2GX	1995	12754	8.512999535	0	0	8448	5000 - 9999 GT	6	4.77363121	75.45781527	238.2347121	0.409977395	2.386016392	0.316922826	743.8888889	
2023-03	polarcode	1	257785000	9197404		NORBJORN	NIS	FS Ice Class 1A	5	General cargo ships	A31	General Cargo	A31A2GX	2000	3389	5.546000004	0	0	2528	1000 - 4999 GT	6	2188.888444	59.33616793	187.8589473	0.439087649	2.657643124	0.249211902	396.2730556	
2023-03	polarcode	1	273386650	9044748		GRIGORY SHELIKHOV	RUS	FS Ice Class 1A	5	General cargo ships	A31	General Cargo	A31A2GX	1992	12150	8.609999657	0	0	7949	5000 - 9999 GT	6	1154.368386	65.14462329	206.2487619	0.449573065	3.076607874	0.273607419	270.6183333	
2023-03	polarcode	1	273137100	8729810		SEVMORPUT	RUS	FS Ice Class 1A	5	General cargo ships	A31	General Cargo	A31A2GX	1988	34615	11.800000019	0	0	38226	25000 - 49999	6	694.7870562	96.7418375	306.1731314	0.713991379	6.372606527	0.81492564	96.76722222	
2023-03	polarcode	1	273312530	9310018		ANTEY	RUS	FS Ice Class 1A	10	Offshore supply ships	B21	Offshore Supply	B21B2OA	2006	3867	8.5	0	85	5871	5000 - 9999 GT	0	579.9455227	61.03984976	193.5983452	0.451694888	3.209606688	0.10987173	59.66416667	
2023-03	polarcode	1	273348020	9402407		TOBOY	RUS	FS Ice Class 1A	10	Offshore supply ships	B21	Offshore Supply	B21B2OA	2008	1930	9.300000191	75.19999695	0	4406	1000 - 4999 GT	0	283.9422678	106.2700622	337.9024871	0.78639846	4.753641966	0.191286111	745.395	
2023-03	polarcode	1	273384430	9720720					10	Offshore supply ships	B21	Offshore Supply									1000 - 4999 GT	0	1505.676443	263.0466131	834.6134815	1.946543814	11.81608523	0.47348363	570.2105556
2023-03	polarcode	1	273394350	9777101		ALEKSANDR SANNIKOV	RUS	FS Ice Class 1A	10	Offshore supply ships	B21	Offshore Supply	B21B2OT	2018	4581	8	116.5	35	11295	10000 - 24999	6	208.0456566	222.0766098	702.014981	1.191371228	7.320001615	0.932721762	743.8216667	
2023-03	polarcode	1	257843000	9645932		ARCTIC PEARL	NOR	FS Ice Class 1C	10	Offshore supply ships	B21	Offshore Supply	B21A2OS	2013	3750	6.099999905	0	0	3963	1000 - 4999 GT	0	722.5979433	47.83856177	151.9831838	0.354005371	2.143431284	0.086109417	531.8216667	
2023-03	polarcode	1	273318120	9307724		SCF SAKHALIN	RUS	FS Ice Class 1A Super	10	Offshore supply ships	B21	Offshore Supply	B21A2OS	2005	4298	7.5	93.93599701	0	40	6882	5000 - 9999 GT	0	1255.844924	284.8175071	904.589266	1.78598764	12.16378218	0.512671513	625.8408333
2023-03	polarcode	1	273319940	9338230		HERMES	RUS	FS Ice Class 1A	10	Offshore supply ships	B21	Offshore Supply	B21B2OA	2006	3949	8	0	80	5871	5000 - 9999 GT	0	22.42004482	161.1578465	513.3752897	0.676865401	3.903653247	0.290084124	744.275	
2023-03	polarcode	1	257564000	9690949		POLARSSVSEL	NOR	FS Ice Class 1B	10	Offshore supply ships	B21	Offshore Supply	B21A2OS	2014	3700	6.400000095	0	0	4324	1000 - 4999 GT	0	527.2313067	43.23310981	138.0482989	0.319924948	1.917730486	0.077819641	743.9625	
2023-03	polarcode	1	273296430	9576181		MURMAN 1	RUS	FS Ice Class 1A	10	Offshore supply ships	B21	Offshore Supply	B21A2OS	2010	1536	4.900000095	0	0	1840	1000 - 4999 GT	0	1612.019965	65.47443444	207.7876572	0.484510815	2.939857883	0.117853982	328.2266667	
2023-03	polarcode	1	982575640	9690949				FS Ice Class 1B	10	Offshore supply ships	B21	Offshore Supply									1000 - 4999 GT	0	5.09337797	0.39983492	1.270742835	0.002958778	0.017901845	0.000719703	3.017777778
2023-03	polarcode	1	258430000	9257591		NORSEL	NIS	FS Ice Class 1B	15	Oil product tankers	A13	Oil	A13B2TP	2003	3535	5.75	0	0	2490	1000 - 4999 GT	6	3641.963633	132.2731252	418.2903612	0.978821125	5.898733372	0.555547119	560.7677778	
2023-03	polarcode	1	273340490	9000235		PANDAR	RUS	FS Ice Class 1A	15	Oil product tankers	A13	Oil	A13B2TP	1991	6810	7.510000229	108.4199982	0	5025	5000 - 9999 GT	6	1901.495235	79.18340774	250.5628149	0.560616653	3.78666741	0.332570313	350.4205556	
2023-03	polarcode	1	273443770	7635347		ALISA	RUS	FS Ice Class 1A	15	Oil product tankers	A13	Oil	A13B2TP	1977	2174	4.776000023	0	0	1384	1000 - 4999 GT	6	76.20343844	24.062772	75.86017632	0.178064513	1.060735558	0.101603643	665.3344444	
2023-03	polarcode	1	257702000	9200158		POLAR VIKING	NIS	FS Ice Class II	15	Oil product tankers	A13	Oil	A13B2TP	2000	2713	5.179999828	71.90000153	0	1685	1000 - 4999 GT	6	2187.703918	58.66143597	185.6379498	0.434094626	2.622950145	0.246378027	498.5580556	
2023-03	polarcode	1	273312850	9353058		URARTU	RUS	FS Ice Class 1A	15	Oil product tankers	A13	Oil	A13B2TP	2009	3500	4.5	0	0	2897	1000 - 4999 GT	6	1266.716562	92.93691553	293.6355867	0.687733177	4.130766918	0.39035045	743.8936111	
2023-03	polarcode	1	273357330	9585273		ENISEY	RUS	FS Ice Class 1A Super	15	Oil product tankers	A13	Oil	A13B2TP	2011	18902	10	160.2400055	0	16110	10000 - 24999	6	1157.088907	120.9470489	386.6987296	0.895008162	9.317604035	1.170160934	138.1163889	
2023-03	polarcode	1	273453010	8912508		ZALIV KRESTA	RUS	FS Ice Class 1B	15	Oil product tankers	A13	Oil	A13B2TP	1991	23480	10.329999992	160.8300018	0	14332	10000 - 24999	6	898.7694336	90.79252218	289.3301882	0.626890388	5.774707764	0.765071459	193.7133333	
2023-03	polarcode	1	273292090	9183831		NP DUDINKA	RUS	FS Ice Class 1A	15	Oil product tankers	A13	Oil	A13B2TP	2000	21871	8.81000042	155.8699951	0	14400	10000 - 24999	6	2601.954112	180.8474436	577.2758474	1.332686824	13.1938813	1.638363379	316.9430556	
2023-03	polarcode	1	331356000	6617790		MASIK SIORAQ	DEN	FS Ice Class 1A	12	Other activities	B33	Dredging	B33B2DT	1966	711	0	0	0	407	< 1000 GT	0	198.6444703	1.48720178	4.750525763	0.011005294	0.065436878	0.002676963	742.9341667	
2023-03	polarcode	1	331197000	5026619		HOLMI	DEN	FS Ice Class 1A	12	Other activities	B33	Dredging	B33A2DG	1961	457	3.503999949	0	0	335	< 1000 GT	0	0.799082073	5.964222844	19.12129843	0.04413525	0.262425807	0.0107356	745.1552778	

ASTD FTP SERVER

The table shows data fields for each ship downloaded from the ASTD FTP Server and compares each access level. All downloads are for one month, for the whole ASTD Area.

See example of how the data looks when downloaded on next page.

DATA FIELD	LEVEL 1	LEVEL 2	LEVEL 3	EXPLANATION	PAGE
mmsi	YES	NO	NO	The identification number of the AIS-equipment on the vessel	11
imonumber	YES	NO	NO	IMO number of the ship	11
ship_id	NO	YES	YES	Id of the ship – unique for each month.	11
date_time_utc	YES	YES	YES	Date/time of the AIS message reported by the vessel	-
vesselname	YES	NO	NO	Name of the ship	11
flagname	YES	YES	YES	Name of the ship flag	12
flagcode	YES	YES	YES	Code for the ship flag	12
iceclass	YES	YES	YES	Ice class of the ship	13
sizegroup_gt	YES	YES	YES	Size of ship (ASTD aggregation)	17
gross_tonnage	YES	YES	YES	Registered gross tonnage of the ship	17
deadweight	YES	YES	NO	DWT of the ship	17
draught	YES	YES	NO	Draught of the ship	17
lengthregistered	YES	YES	NO	Length of the ship	17
passengercapacity	YES	YES	NO	Maximum passenger capacity	17
yearofbuild	YES	YES	YES	Year which a vessel was delivered to its original owner by a shipbuilder.	-
astd_cat	YES	YES	YES	Type of ship (ASTD aggregation)	14-16
lloyds3_cat	YES	YES	NO	Type of ship (Lloyds aggregation)	14-16
lloyds5_cat	YES	NO	NO	Type of ship (Lloyds aggregation)	14-16
arcticshiptype	YES	YES	YES	Ship types representative for the Arctic	
fuelquality	YES	YES	YES	Type of fuel used	18-19
fuelcons	YES	YES	YES	Fuel consumption in metric tons from last signal	18-19
co	YES	YES	YES	Co emissions in metric tons from last signal	21
co2	YES	YES	YES	Co emissions in metric tons from last signal	21
so2	YES	YES	YES	So2 emissions in metric tons from last signal	21
nox	YES	YES	YES	Nox emissions in metric tons from last signal	21
dist_nextpoint	YES	YES	YES	Distance sailed since last point in meters	23
sec_nextpoint	YES	YES	YES	Seconds from last point	23
longitude	YES	YES	YES	Longitude position signal	-
latitude	YES	YES	YES	Latitude position signal	-

DATA EXAMPLE: FTP Server Data download – Level 1

Opened in Notepad++ - imported to Excel

mmsi	imonumber	date_time_utc	vesselname	flagname	flagcode	iceclass	sizegroup_gt	gross_tonnage	deadweight	draught	length_registered	passenger_capacity	year_of_build	astd_cat	lloyds3_cat	lloyds5_cat	arcticshiptype	fuelquality	fuelcons	co2	co	nox	so2	dist_nextpoint	sec_nextpoint	longitude	latitude
210803000	9374727	2025-07-31T09:47:17	FRAKT SUND	Cyprus	CYP		1000 - 4999 GT	2967	4450	6.21999979	84.81999969	0	2009	General cargo ships	General Cargo	General Cargo Ship	General Cargo Ship	6	0.000583	0.001836	4.31E-06	2.56E-05	2.45E-06	1.456	181	14.12524333	66.31695
230035990	7393640	2025-07-31T20:47:02	OSTERN	Finland	FIN		< 1000 GT	474	41	3.098999977	0	150	1974	Passenger ships	Passenger/Ro-Ro Cargo	Passenger/Ro-Ro Ship (Vehicles)	Passenger Ship	0	0.000478	0.001534	3.54E-06	2.10E-05	8.61E-07	0.415	360	21.91178833	60.19415
231118000	8619522	2025-07-31T03:04:44	EIVIND	Faeroes Islands	FAR		< 1000 GT	656	0	4.25	0	0	1988	Fishing vessels	Fish Catching	Fishing Vessel	Fishing Vessel	0	0.002086	0.006687	1.54E-05	9.18E-05	3.75E-06	0.765	371	-6.775341667	62.00663
231356000	9306017	2025-07-31T16:36:54	HELGAPELL	Faeroes (Fas)	FAS		5000 - 9999 GT	8990	11143	8.5	128.6799927	0	2005	Container ships	Container Ship (Fully Cellular)	Container Ship	Container Ship	6	0.000834	0.002638	3.52E-06	1.99E-05	3.50E-06	0	10	-21.83751667	64.14159
244091000	8650813	2025-07-31T08:06:05	NOORDERLICHT	Netherlands	NTH		< 1000 GT	140	0	4	30.57999992	20	1910	Cruise ships	Passenger	Passenger/Cruise	Cruise Ship	0	0.001184	0.003775	8.76E-06	5.21E-05	2.13E-06	1004.278	369	14.42813333	78.18194
251039110	9050709	2025-07-31T01:32:36	TJALDUR	Iceland	ICL	FS Ice Class 1C	< 1000 GT	689	280	5	0	0	1992	Fishing vessels	Fish Catching	Fishing Vessel	Fishing Vessel	0	0.00038	0.001219	2.81E-06	1.67E-05	6.85E-07	0.567	62	-18.09308	65.69269
257068400	8960531	2025-07-31T16:12:55	ANDOVFISK	Norway	NOR		< 1000 GT	120	0	2.700000048	0	0	1995	Fishing vessels	Fish Catching	Fishing Vessel	Fishing Vessel	0	0.001227	0.003934	9.08E-06	5.40E-05	2.21E-06	0.392	361	31.03237333	70.36321
257341000	9665712	2025-07-31T05:23:53	OLYMPIC ARES	Norway (Nis)	NIS	FS Ice Class 1C	5000 - 9999 GT	7888	7150	7.25	0	102	2013	Other service offshore vessels	Other Offshore	Offshore Support Vessel	Other Service Offshore Vessels	0	0.169538	0.53756	0.001255	0.008954	0.000305	2349.716	361	9.551766667	64.04486
265067000	7347627	2025-07-31T23:52:57	ATLE	Sweden	SWD		5000 - 9999 GT	7457	2570	9.079999924	96.01999664	61	1974	Other activities	Other Activities	Icebreaker	Icebreaker	6	0.003524	0.011234	1.48E-05	8.37E-05	6.34E-06	0.077	58	22.17104667	65.57174
576980000	8941808	2025-07-31T10:36:19	REMBRANDT VAN RIJN	Vanuatu	VAN		< 1000 GT	308	350	2.609999895	39.02000046	36	1924	Cruise ships	Passenger	Passenger/Cruise	Cruise Ship	0	0.000287	0.000919	2.12E-06	1.26E-05	5.16E-07	4.325	181	11.62152667	79.85206
273295390	9207819	2025-07-31T08:50:08	TSEFEY	Russia	RUS	FS Ice Class 1B	1000 - 4999 GT	1194	753	7.381999969	0	0	2000	Other activities	Other Fishing	Fish Factory Ship	Fish Factory Trawler	0	0.023868	0.075996	0.000177	0.001065	4.30E-05	2237.329	892	40.62563667	68.86197
275519000	9281786	2025-07-31T01:27:40	NORDLAND	Latvia	LAV	FS Ice Class 1A	1000 - 4999 GT	3173	4525	5.75	92.74700165	0	2003	General cargo ships	General Cargo	General Cargo Ship	General Cargo Ship	6	0.01316	0.041709	9.74E-05	0.000592	2.63E-05	788.266	159	23.948745	65.29153
276829000	9773064	2025-07-31T22:05:23	MEGASTAR	Estonia	ETN	FS Ice Class 1A	25000 - 49999	49134	6080	7.099999905	0	2824	2017	Passenger ships	Passenger/Ro-Ro Cargo	Passenger/Ro-Ro Ship (Vehicles)	Passenger Ship	4	0.063676	0.202147	0.000281	0.001639	0.000127	0.262	362	24.91480333	60.148
319147200	9841392	2025-07-31T01:39:06	HODOR	Cayman Islands	CAY		1000 - 4999 GT	1582	249	2.276000023	0	0	2019	Other activities	Other Activities	Supply Tender	Other Activities	0	0.179124	0.574272	0.001326	0.007881	0.000322	53.593	31860	-123.282335	48.43852
331095100	9199488	2025-07-31T02:10:09	MASIK II	Denmark	DEN		< 1000 GT	139	32	2.299999952	0	0	1998	Other activities	Other Activities	Patrol Vessel	Other Activities	0	0.005721	0.018161	4.23E-05	0.000252	1.03E-05	2256.651	599	-53.034855	65.13386
366959080	8856508	2025-07-31T02:27:34	JEANOAH	United States Of America	USA		< 1000 GT	105	0	0	0	0	1970	Fishing vessels	Fish Catching	Fishing Vessel	Fishing Vessel	0	0.1031	0.329025	0.000763	0.004536	0.000186	50082.866	17949	-153.162605	58.0008
413212240	9860996	2025-07-31T11:37:43	SHEN HAI YI HAO	China, People's Republic Of	CHN	FS Ice Class 1C	1000 - 4999 GT	4700	1704	5.800000191	0	0	2019	Other activities	Research	Research Survey Vessel	Research Vessel	0	0.059672	0.189638	0.000442	0.002672	0.000107	5492.181	1338	-169.3794083	68.26696
441371000	7388310	2025-07-31T02:19:17	NO. 99 OYANG	Korea, South	KRS		1000 - 4999 GT	1703	1069	5.699999809	0	0	1976	Fishing vessels	Fish Catching	Fishing Vessel	Fishing Vessel	0	0.615125	1.962266	0.004552	0.027338	0.001107	48496.492	11245	158.3546317	51.62219
636022067	9739276	2025-07-31T05:15:33	CHEM SOL	Liberia	LIB		10000 - 24999	15717	25253	9.862000465	149.6600037	0	2017	Chemical tankers	Chemical	Chemical/Products Tanker	Chemical Tanker	6	1.034622	3.28008	0.005127	0.022964	0.002069	2.899	12960	-122.868395	49.29045
218799000	9690688	2025-07-31T01:10:25	MARK	Germany	GEU	FS Ice Class II	1000 - 4999 GT	4248	3159	6.5	80.40000153	0	2015	Fishing vessels	Fish Catching	Fishing Vessel	Fishing Vessel	0	0.082748	0.263007	0.000612	0.003704	0.000149	2647.807	421	-21.87654167	66.93821
232035412	9897157	2025-07-31T14:08:13	WESTRA FJORD K193	United Kingdom	GBI		< 1000 GT	421	0	4.5	0	0	2021	Fishing vessels	Fish Catching	Fishing Vessel	Fishing Vessel	0	0.045806	0.146039	0.000339	0.002015	8.25E-05	8002.013	5812	-8.808475	61.19435

DOWNLOAD DATA DAMPLE FROM FTP SERVER

The data sample is for January 2015. It is almost 500mb unzipped and requires specialized software to open and work with.

[CLICK TO DOWNLOAD](#)

SHIP IDENTIFICATION

ASTD Contains several ways to identify vessels:

SHIP ID

The *ship_id* field contains a number for each ship. The *ship_id* is consistent for each ship per month, but changes between months.

MMSI

The MMSI number (Maritime Mobile Service Identity) is a unique nine-digit number for identifying a ship's AIS-equipment. It provides an internationally standardized number for contacting the vessel.

IMO NUMBER

A unique reference number is assigned to each ship for identification purposes, assigned by S&P Global on behalf of the IMO. ASTD contains the latest known IMO number for given MMSI whenever IMO number is not reported.

FISHING VESSEL NUMBER

Identification information for fishing vessels.

VESSEL NAME

ASTD contains names of ships, but as names are not unique, using IMO or MMSI is better for ship identification. The name is taken from the latest AIS report of the ship.

FOR ASTD
LEVEL 2 AND
LEVEL 3



AVAILABLE ON LEVEL 1 ONLY

FLAG CODES

- ASTD data includes “*Flag Codes*” for each ship. A Flag Code represents the national ship registry where the ship is registered. Some countries have more than one national ship registry.
- Users should match the Flag Code to the National Ship Registry if it is unknown to them.
- A document with ASTD Flag Codes is available to download [here](#).

EXAMPLE

The first two columns show ASTD data when downloaded. The National Ship Registry Column is made using the [Flag Code document](#).

NAME OF SHIP	FLAG CODE	NATIONAL SHIP REGISTRY
SUNNANVIK	SWD	Sweden
SVYATOY PETR	RUS	Russia
ORASILA	DIS	Danish International Ship Registry
ISFJORD	NIS	Norway International Ship Registry
BRUARFOSS	FAS	Faroe Islands
BORIS SOKOLOV	CYP	Cyprus
SJOVEIEN	PAN	Panama
REMBRANDT VAN RIJN	VAN	Vanuatu
NATIONAL GEOGRAPHIC	BAH	Bahamas
ANTIGUA	NTH	Netherlands
OSTERFJORD	NOR	Norway
POLAR NATAARNAQ	DEN	Denmark
PISON	FAR	Faroe Islands
U. S. LIBERATOR	USA	United States
STEFFANO	ETN	Estonia
KIRKELLA	GBI	United Kingdom
CIDADE DE AMARANTE	PTG	Portugal
GERDA MARIA	GEU	Germany
TAURUS	LTH	Lithuania
SOLBERG	ICL	Iceland
MONTE MEIXUEIRO	SPN	Spain
NIKOLAY URVANTSEV	HKG	Hong Kong
DORADO 2	LAV	Latvia
POLARFRONT	FIS	French International Ship Registry

ICE CLASS OF SHIPS IN ASTD

- Ice class refers to a notation assigned by a classification society or a national maritime authority to denote the additional level of strengthening as well as other arrangements that enable a ship to navigate through sea ice. Some ice classes also have requirements for the ice-going performance of the vessel.
- ASTD ice classes are based on the Finnish-Swedish Ice Class Rules, which are cooperatively developed by the Finnish and Swedish maritime authorities.
- If ice class information is missing in the ASTD, the vessel does not have a registered ice class.

**ICE CLASSES OF
SHIPS:** *Finnish-
Swedish Ice Class
Rules explained*

SHIP TYPE AGGREGATION

- S&P Global assigns and validates IMO numbers on behalf of the IMO. IMO Numbers are issued from the global maritime databases maintained by S&P Global and consist of a unique seven-digit number. S&P Global manages this Scheme on behalf of the IMO.
- ASTD uses the AIS number to identify each ship, including its type and characteristics.
- S&P Global uses the *Statcode 5 Shiptype Coding System* to assign ship types to each ship. ASTD uses the same system to aggregate ship types. See an example on next page.
- A document showing how ASTD aggregates ship types is available to [download here](#).

*S&P Global
website for
IMO number
scheme*

SHIP TYPE AGGREGATION: DATA FIELDS EXPLAINED

Data fields for ship types in ASTD are not the same in the ASTD System as in FTP Server. Here, all fields are explained.

ASTD SYSTEM

norwegianshiptypeid	Refers to an id in the ASTD Database to match with the column below. Each id represents the name of a ship type. Available to all users.
norwegianshiptypename	Refers to the ship type aggregated from <i>lloyds5_cat</i> to 16 ship types, referred to as the <i>Norwegian ship type</i> or the <i>ASTD Ship type</i> . Available to all users.
lloydsshiptypeid	Refers to an id in the ASTD Database to match with the column below. Each id represents the name of a ship type. Available for ASTD Level I and Level II users.
lloydsshiptyname	Refers to the ship types aggregated from <i>lloyds5_cat</i> to 56 ship types. Available for ASTD Level I and Level II users.
lloyds5_cat	Refers to an ID at the highest level available, the ID is used to match with a ship type in the ASTD Ship Type document . Available for ASTD Level I users.

FTP SERVER

astd_cat	Same as the <i>norwegianshiptyname</i> field. Refers to the ship type aggregated from <i>lloyds5_cat</i> to 16 ship types, referred to as the <i>Norwegian ship type</i> or the <i>ASTD Ship type</i> . Available to all users.
lloyds3_	Same as the <i>lloydsshiptyname</i> field. Refers to the ship types aggregated from <i>lloyds5_cat</i> to 56 ship types. Available for ASTD Level I and Level II users.
lloyds5_cat	Refers to an ID at the highest level available, the ID is used to match with a ship type in the ASTD Ship Type document . Available for ASTD Level I users.

SHIP TYPE AGGREGATION - EXAMPLE

	StatCode Level 5 (Iloyds5_cat)	Level 5 Ship Type	StatCode Level 3 (Iloydsship typename & Iloyds3_)	Level 3 Ship Type	ASTD Ship Type (norwegianshiptyp ename & astd_cat)	Description
	Available to ASTD Level 1 users		Available to ASTD Level 2 users		Available to ASTD Level 3 users	
CHEMICAL TANKERS	A12A2LP	Molten Sulphur Tanker	A12	Chemical	Chemical tankers	A tanker for the bulk carriage of molten sulphur in insulated tanks at a high temperature
	A12A2TC	Chemical Tanker	A12	Chemical	Chemical tankers	A tanker for the bulk carriage of chemical cargoes, lube oils, vegetable/animal oils and other chemicals as defined in the International Bulk Chemical Code. Tanks are coated with suitable materials which are inert to the cargo
	A12B2TR	Chemical/Products Tanker	A12	Chemical	Chemical tankers	A chemical tanker additionally capable of the carriage of clean petroleum products
	A12C2LW	Wine Tanker	A12	Chemical	Chemical tankers	A cargo ship designed for the bulk transport of wine in tanks. Tanks will be stainless steel or lined. New vessels will be classified as chemical carriers
	A12D2LV	Vegetable Oil Tanker	A12	Chemical	Chemical tankers	A cargo ship designed for the bulk transport of vegetable oils in tanks. Tanks will be stainless steel or lined. New vessels will be classified as chemical carriers
	A12E2LE	Edible Oil Tanker	A12	Chemical	Chemical tankers	A cargo ship designed for the bulk transport of edible oils in tanks. Tanks will be stainless steel or lined. New vessels will be classified as chemical carriers
	A12F2LB	Beer Tanker	A12	Chemical	Chemical tankers	A tanker for the bulk carriage of beer
	A12G2LT	Latex Tanker	A12	Chemical	Chemical tankers	A tanker for the bulk carriage of latex
	A14E2LJ	Fruit Juice Carrier, Refrigerated	A14	Other Liquids	Chemical tankers	A tanker for the bulk carriage of fruit juice concentrate in refrigerated tanks. May be arranged for the additional carriage of containers on deck
	A14F2LM	Molasses Tanker	A14	Other Liquids	Chemical tankers	A tanker for the bulk carriage of molasses
	A14G2LG	Glue Tanker	A14	Other Liquids	Chemical tankers	A tanker for the bulk carriage of glue
	A14H2LH	Alcohol Tanker	A14	Other Liquids	Chemical tankers	A tanker for the bulk carriage of alcohol
	A14N2LL	Caprolactam Tanker	A14	Other Liquids	Chemical tankers	A tanker for the bulk carriage of caprolactam, a chemical used in the plastics industry for the production of polyamides
A22A2BN	Bulk/Caustic Soda Carrier (CABU)	A22	Bulk Dry / Oil	Chemical tankers	A bulk carrier with certain holds arranged with tanks for the alternative (but not simultaneous) carriage of caustic soda	

ARCTIC SHIP TYPES

- **ASTD has many different ship type aggregations assigned to ships.**
- **One of these is a new ship type aggregation called Arctic ship types.**
- **It reduces the “Other activities” ship type compared to before.**
- **Furthermore, it includes icebreakers, research vessels and tugs, whom are both frequent in the Arctic and specific to the region.**

Arctic Ship types	ASTD Ship types
Bulk Carrier	Bulk carriers
Chemical Tanker	Chemical tankers
Container Ship	Container ships
Crude Oil Tanker	Crude oil tankers
Cruise Ship	Cruise ships
Fish Carrier	Fishing vessels
Fish Factory Trawler	Gas tankers
Fishing Vessel	General cargo ships
Gas Tanker	Offshore supply ships
General Cargo Ship	Oil product tankers
Icebreaker	Other activities
Offshore Supply Ships	Other service offshore vessels
Oil Product Tanker	Passenger ships
Other Activities	Refrigerated cargo ships
Other Fishing Vessels	Ro-Ro cargo ships
Other Service Offshore Vessels	
Passenger Ship	
Refrigerated Cargo Ship	
Research Vessel	
Ro-Ro Cargo Ship	
Tug	
Unknown	

SHIP CHARACTERISTICS: EXPLAINED

DEADWEIGHT	DRAUGHT	LENGTH REGISTERED	PASSENGER CAPACITY	GROSS TONNAGE	VESSEL SIZE DESCRIPTION
<p>Deadweight (dwt) - The weight in tonnes (1000 kg) of cargo, stores, fuel, passengers and crew carried by the ship when loaded to her maximum summer draught.</p>	<p>Maximum draught of vessel in Meters. Measured from the lowest point on the hull to the water level when at the maximum permissible summer load line.</p>	<p>Registered length in meters. The length of the vessel is measured from the furthest part of the bow and the centerline of the rudder stock. This is the value as displayed on the flag of registration certificate.</p>	<p>Total passenger capacity available (on deck and in berths).</p>	<p>Gross Tonnage is a function of the moulded volume of all enclosed spaces of the ship as per the 1969 International convention on tonnage measurement of ships.</p>	<p>ASTD also aggregates ships Gross Tonnage to seven categories:</p> <ul style="list-style-type: none">< 1000 GT1000 - 4999 GT5000 - 9999 GT10000 - 24999 GT25000 - 49999 GT50000 - 99999 GT>= 100000 GT

ASTD FUEL INFORMATION: TYPES

As IMO changed the regulations on sulphur content in fuel as of 1.1.2020, fuel information in ASTD is different before and after that date.

The ASTD fuel type information refers to the main engine fuel.

READ MORE:

*IMO 2020 sulphur
limit implementation
- carriage ban enters
into force*

IMO: March 2020

BEFORE 1.1.2020

Fuel information is categorized by six types of fuel. The data field fuelquality contains a number which is matched to the table below.

0	Distillate marine fuel (MGO/MDO)
1	Residual marine fuel and heavy distillate (ISO-F-10 - 80)
2	Residual marine fuel (IFO-F-80 - 180) heavy fuel oil
3	Residual marine fuel (IFO-F-180 - 380 or above) heavy fuel oil
4	Liquid natural gas (LNG)
5	Battery power

AFTER 1.1.2020

Fuel information is categorized by four types of fuel. The data field fuelquality contains a number which is matched to the table below.

0	Distillate marine fuel (MGO/MDO)
4	Liquid natural gas (LNG)
5	Battery power
6	Residual marine fuel (replaced groups 1,2 and 3 into one from 2020).

ASTD FUEL INFORMATION: CALCULATION

- Fuel consumption in ASTD is measured in Metric Tons.
 - For the ASTD System, the data is aggregated for the ship for the given month
 - For the FTP Server, the data is between AIS messages (positions), so users have to make their own calculations.
- To calculate fuel consumption, users can aggregate the *fuelcons* data field:

DATA EXTRACTED FROM ASTD FTP SERVER: LEVEL 1	date_time_utc	vesselname	fuelcons	dist_nextpoint	sec_nextpoint	longitude	latitude	
	7/10/2018 0:00	ENNIBERG	0.085419096	2321.344	361	25.58781	71.24021	
	7/10/2018 0:06	ENNIBERG	0.08438621	2339.384	369	25.65239	71.2412	
	7/10/2018 0:12	ENNIBERG	0.08385511	2303.604	361	25.71747	71.2422	
	7/10/2018 0:18	ENNIBERG	0.08198549	2314.87	370	25.78157	71.24303	
	7/10/2018 0:24	ENNIBERG	0.0791576	2248.606	361	25.84601	71.24377	
<i>Points from rest of day excluded from this example</i>								
RESULT: THE FISHING VESSEL ENNINBERG CONSUMED 12.83 METRIC TONS OF FUEL FROM 00:00 AND 23:57 ON OCTOBER 7th 2018.	7/10/2018 23:33	ENNIBERG	0.018696176	674.0636	370	32.37227	70.25326	
	7/10/2018 23:39	ENNIBERG	0.081220426	2302.133	369	32.38686	70.24977	
	7/10/2018 23:45	ENNIBERG	0.078736156	2243.539	361	32.44735	70.25248	
	7/10/2018 23:51	ENNIBERG	0.08243172	2320.164	370	32.50608	70.25566	
	7/10/2018 23:57	ENNIBERG	0.08749976	2378.666	370	32.56686	70.25887	
	<i>Total fuel consumption:</i>			<i>12.82841752</i>				

NUMBER OF SHIPS IN THE PRE-DEFINED AREAS

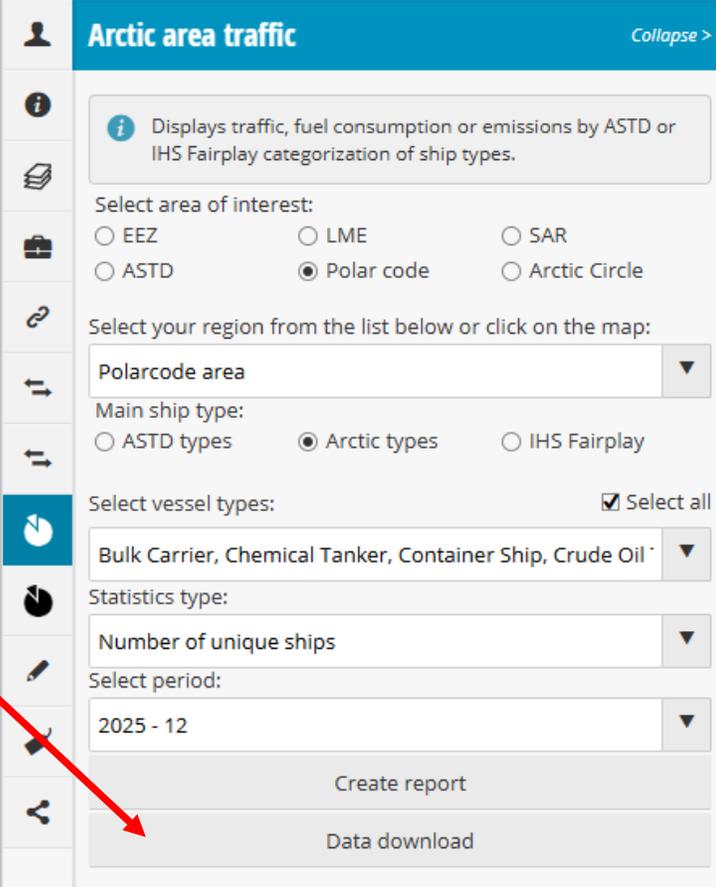
ASTD provides several pre-defined areas for statistical analysis.

For **Level 2 and Level 3 users**, identifying the number of ships in a specific area over a set timeframe requires a specific workflow. Because *ship_id* values change over time, the standard Excel "Remove Duplicates" function will not work accurately on a multi-month dataset.

To ensure data integrity for detailed analysis, users should follow these steps:

- 1. Download monthly data:** Extract data for each month within the desired period individually.
- 2. Remove duplicates:** Use the Excel duplicate removal tool on the *ship_id* column for **each month separately**.
- 3. Aggregate:** Once each month is cleaned, merge the monthly totals to calculate the aggregate data for the full year or chosen period.

Example: A Level 3 user seeking annual data should download 12 individual monthly files, remove duplicate IDs within each file, and then combine those results into a single annual report.



Arctic area traffic Collapse >

i Displays traffic, fuel consumption or emissions by ASTD or IHS Fairplay categorization of ship types.

Select area of interest:

EEZ LME SAR
 ASTD Polar code Arctic Circle

Select your region from the list below or click on the map:

Polarcode area ▼

Main ship type:

ASTD types Arctic types IHS Fairplay

Select vessel types: Select all

Bulk Carrier, Chemical Tanker, Container Ship, Crude Oil ▼

Statistics type:

Number of unique ships ▼

Select period:

2025 - 12 ▼

Create report

Data download

DISTANCE SAILED

- Sailed distance calculates the distance a ship sails
- ASTD System Download: Aggregated for a specific ship, per month, in nautical miles.
 - FTP Server: Not aggregated, only the distance to the next AIS point is shown (in meters).
- To calculate sailed distance from the ASTD System Download, users can aggregate the *distance_nm* data field.

DATA DOWNLOADED FROM ASTD SYSTEM ON LEVEL 3: REFRIGERATED CARGO SHIPS IN AUGUST 2023 IN THE POLAR CODE AREA

Result: All Refrigerated cargo ships which operated in the Arctic Polar Code Area in August 2023 sailed a total of **28.385 nautical miles**.

ship_id	distance_nm
678752641	447.4422192
1183955587	445.7237171
1214378204	389.3965853
205541528	1582.607832
2085431710	1513.316357
292651238	125.2485653
1177992752	89.7315324
1396719016	922.2421118
4318144	1258.947736
1218720291	509.6022576
1422359902	673.0680113
2059886045	244.2860778
898781001	277.363304
1700004637	301.7671874
1485251942	702.4789104
376172036	33.77325108
1253950234	732.6287462
1276410740	927.6464768
358526016	740.9039854
308721009	766.8940497
1160713059	413.2701388
1467375841	975.1508747
2027878929	3770.898587
1505855006	234.841567
1183617473	491.8889077
1904386502	678.8842883
201153845	187.3589428
1490585635	745.1513974
254501721	330.9877187
497699630	1464.604928
577931545	737.7206814
1767508517	590.4060821
1324293047	881.1826971
265411885	145.7432748
1138715978	495.7164811
1339556273	185.9946031
1375739116	92.66961393
1914139368	2679.687118
1198891381	597.7129195
Total	28384.93974

ASTD SHIP EMISSIONS

ASTD contains ship emission calculations for Co2, CoE, Nox and So2. All units are in metric tons.

- For the ASTD System Download: Calculations are for each ship for the chosen month/year
- For the FTP Server: Emissions for the distance between this and previous point/AIS message.
Users conduct own calculations.

To calculate emissions from the ASTD System Download, users can aggregate the data fields between the desired period, as this example shows:

DATA DOWNLOADED FROM ASTD SYSTEM: LEVEL 1 10 (OUT OF 65) BULK CARRIERS IN THE POLAR CODE AREA IN AUGUST 2023

mmsi	imonumber	vesselname	co2emission	coemission	noxemission	so2emission
352001477	9838838	ADMIRAL SCHMIDT	210.8116043	0.449314514	4.12410675	0.526969641
273614220	9741724	ALARA	476.3633349	1.056313769	10.15401637	1.312188728
636015170	9593476	AM GHENT	587.4620307	1.355339542	14.13911671	1.767071576
538005067	9624122	AM KRAKOW	209.820003	0.485785507	5.012890065	0.626921281
354260000	9434515	AMSTEL TIGER	238.9055975	0.538181807	5.455265719	0.701509073
636022382	9407471	ANNA-ELISABETH	57.66534302	0.131440433	1.333915206	0.169133099
319147600	9514406	ANNA-META	177.9319175	0.358157133	3.148739562	0.455341601
316044196	9854698	ARVIK I	695.7069006	1.55948652	15.32886935	1.971832246
354437000	9839076	DREAM SKY	407.8454429	0.924950259	9.446625361	1.207477421
273212240	9079169	ENISEY	777.5341135	1.762230281	17.87787617	2.282459572
Total emissions:			3840	9	86	11

ASTD SHIP EMISSIONS - DISCLAIMER

Please note that the emission estimates in the ASTD Program are less accurate after January 1, 2020, compared to earlier data. The reason are changes in international regulations on permitted sulphur content in marine fuels, known as “IMO 2020” ([link](#)) and regulated in Annex VI of the International Convention for the Prevention of Pollution from Ships (MARPOL). These changes led to significant modifications in marine fuel formulations, which affects emissions and are not sufficiently accounted for in the current estimates.

OPERATION HOURS

The ASTD System provides calculations for time spent in a given area. Note that this refers to when ships have their AIS transponders turned on. The units are in hours. To calculate operational hours, users can aggregate the data field *operationhour*.

General Cargo Ships in the Greenlandic EEZ in August 2023, from ASTD System Download - Level 1.

mmsi	imonumber	vesselname	operationhour
219024883	7600287	NORTH VIKING	451.425
219027854	9854636	SIUANA ARCTICA	743.985
219027908	9854648	MALERAQ ARCTICA	743.9686111
219029632	9881421	TILIOQ ARCTICA	744.6719444
219029633	9881419	ARPAARTI ARCTICA	743.9797222
219364000	9618161	NANOQ ARCTICA	289.7886111
219663000	9618159	MINIK ARCTICA	745.5505556
219667000	9618147	IVALO ARCTICA	744.7972222
219668000	9618135	MALIK ARCTICA	408.4030556
228443600	9961659	PERSEVERANCE	213.4241667
244693000	9365659	AMERICABORG	18.07055556
244750715	9546473	TIBERBORG	77.17194444
245634000	9466374	ALASKABORG	86.24416667
246263000	9466336	AMURBORG	84.77666667
246519000	9466300	ALBANYBORG	33.74888889
246556000	9333539	ARNEBORG	51.00083333
366750000	9210309	MAJ RICHARD WINTERS	370.8005556
367535950	9437335	OCEAN GIANT	78.64777778
			6630

Result: General Cargo ships spent 6630 hours in the Greenlandic EEZ in August 2023. On average, the 18 ships spent 15 hours in the EEZ.

SHIP TRACKS USE IN QGIS

The use of ship tracks in ASTD can be straightforward, but acquiring these to QGIS has been made available as of October 2025.

QGIS

QGIS stands for Quantum Geographic Information System. It is one of the world's leading free and open-source desktop Geographic Information System (GIS) software applications and serves as a powerful tool that allows users to work with map-related data (geospatial data).

AIS

Automatic Identification System

AIS is a maritime navigation safety communications system standardized by the International Telecommunication Union (ITU) and adopted by the International Maritime Organization (IMO) to provide information about ship type, position (recorded every 6 minutes in ASTD), course, speed, navigational status, and other safety-related information.

SOLAS regulation 19 requires AIS to be fitted aboard all ships of 300 or more gross tonnage engaged on international voyages; cargo ships of 500 or more gross tonnage not engaged on international voyages; and all passenger ships irrespective of size. SOLAS regulation 19 became effective 31 December 2004.

[*IMO: Automatic identification systems \(AIS\)*](#)

AIS TRANSCEIVERS

Automatic identification system (AIS) transceivers automatically provide position, identification and static data (vessel details) to nearby ships, land based stations and satellites. There are two types of AIS transceivers: Class A and Class B.

Class A transceivers transmit with a power of 12.5W. Position is reported autonomously every 2-10 seconds dependent on the vessel's speed and/or course changes (every three minutes or less when at anchor or moored); and the vessel's static and voyage related information every 6 minutes. Class A transceivers are also capable of text messaging safety related information and AIS Application Specific Messages, such as meteorological and hydrological data, electronic Broadcast Notice to Mariners, and other marine safety data.

Class B transceivers do not meet the SOLAS 19 regulation requirements, but provide similar benefits to smaller vessels at a lower cost and with a simpler installation. Generally they report less frequently than Class A transceivers. Transmit power is 2W. They can receive safety related text and application specific messages but cannot transmit them. The vessel's static data is reported, however none of the voyage related information is.

[Types Of Automatic Identification Systems \(Per ITU-R M.1371 And IEC Standards\) | Navigation Center \(uscg.gov\)](#)

ASTD only includes signals transmitted by ships carrying AIS Class A transceivers. Thus, ASTD includes information on all ships that are required to carry AIS Class A transponders as well as any other ships not subject to SOLAS Regulation 19 that voluntarily opt to carry AIS Class A transceivers.

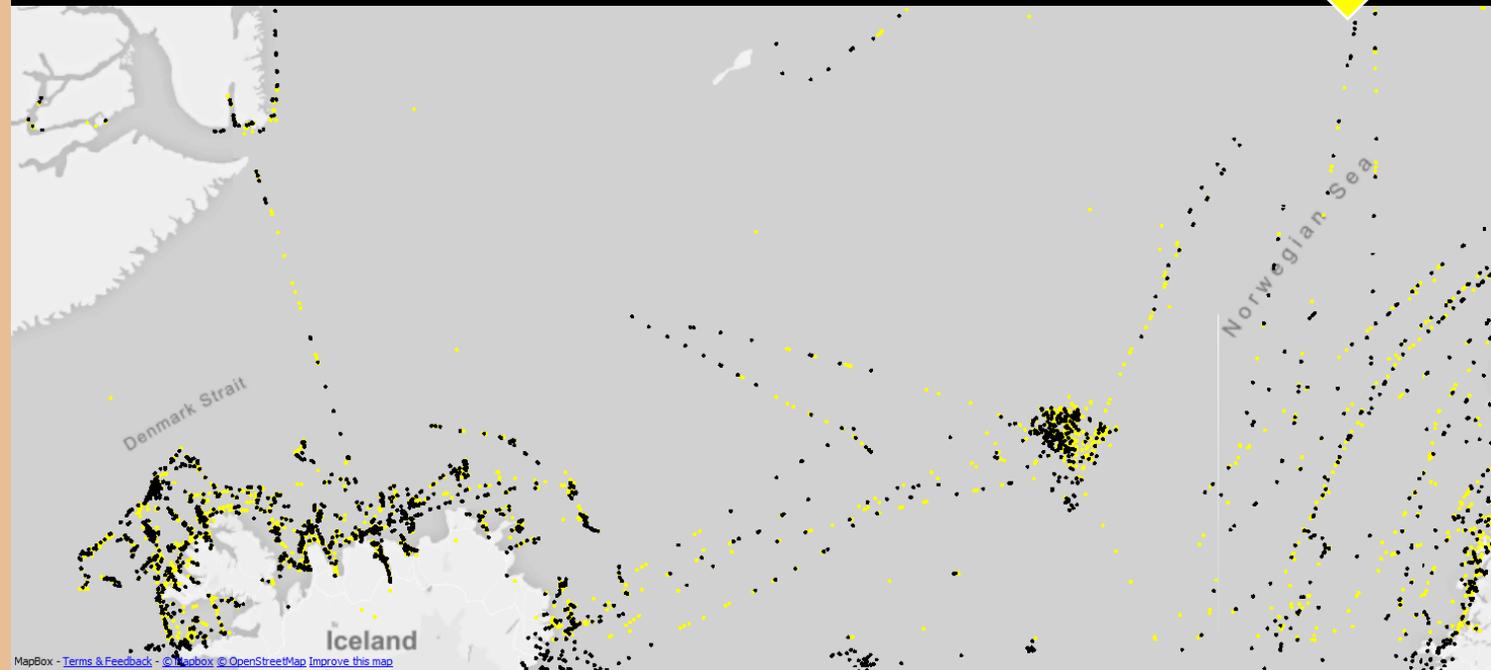
General AIS Limitations

AIS data in the ASTD System does not cover 100% of all ship traffic, but data quality is very high. This has been confirmed by comparing ASTD System data with data from other sources, including national collected information. Identifying pleasure craft and smaller fishing vessels can be challenging because these vessels are not required to carry AIS Class A transceivers.

In addition, numerous factors can affect the transmission and/or receipt of AIS signals, including:

- Technical failures due to faulty infrastructure (vessel and data flow)
- Erroneous onboard installation of AIS transceiver
- Problems with data links/networks
- Manipulation of AIS signals
- Data noise
- Satellite coverage limitations

The image below shows how AIS Class A transceiver data from the USA (yellow dots) supplements AIS Class A transceiver data from Norway (black dots) to give ASTD a more detailed and accurate picture of ship traffic.



ASTD Data Quality

The data in ASTD is very accurate. The data collected is vast, hundreds of gigabytes every year. Approximately 4 million records are added to the database every 24 hours. As outlined on page 18 of this document, AIS signals are not 100% accurate.

There are many variables which affect databases like ASTD. When comparing data between AIS databases, the information might not be 100% aligned. For example, there could be differences in the number, position and range in satellites which collect AIS signals. Data quality in ASTD is very high.

Working with ASTD Data

Data downloaded from the ASTD FTP requires sufficient computing capacity and the expertise of a GIS analyst.

Examples of software programs needed to work with ASTD data include CSV Explore, Python, or SQL databases like MySQL and PostgreSQL.

Keep this in mind when downloading large amounts of data.

However, smaller data samples can be downloaded by regular users, not specific GIS experts, and analyzed Excel. One has to download data and convert from CSV but from there analysis can be performed.

Please be careful with calculations to only use correct data.

Working with Data – “Data cleaning”

Please note that specific corrections are needed after downloading data to have as correct data as possible.

Satellites in orbit may pick up AIS signals from vessels located outside the geographic area covered by ASTD under certain atmospheric conditions.

In reports which the ASTD System can automatically generate, the ASTD System filters out all AIS Class A transceiver signals from ships for which satellites have picked up fewer than 10 positions in one month. ASTD users who download data from the FTP server for analysis must filter out this type of information themselves.

Please be aware when downloading data from the FTP server, data cleanup must be undertaken by the user to remove anomalies and other signals which could result in inaccurate analysis.



PAME

Protection of the Arctic Marine Environment



More information: hjalti@pame.is