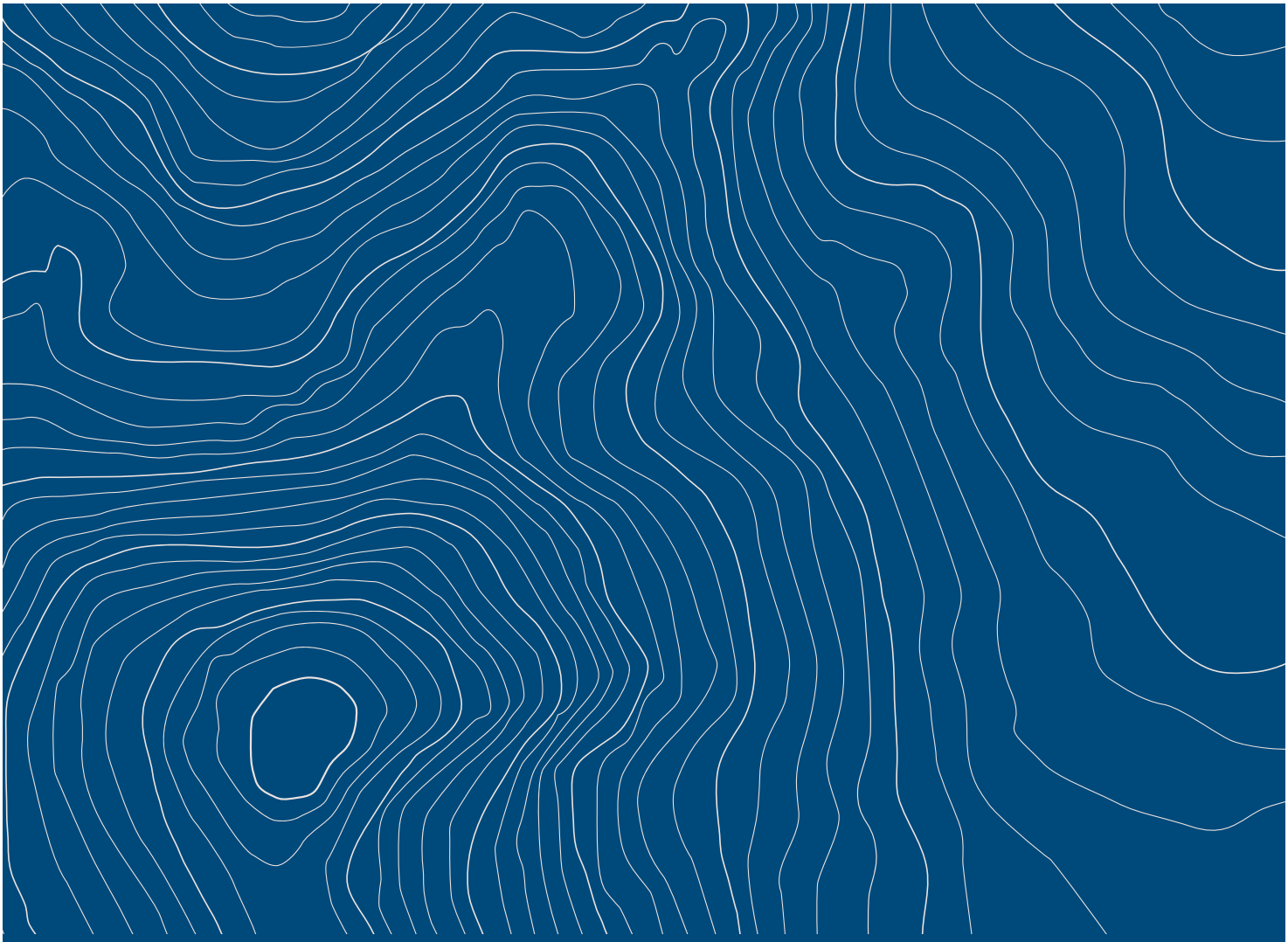

Dublin Array
Generation for generations

EIAR Volume 4: Offshore Infrastructure Technical Appendices
Appendix 4.3.10-2
Dublin Array Offshore Wind Farm Winter Survey 2019

Kish Offshore Wind Ltd

RWE SLR GoBe APEM Group

www.dublinarray-marineplanning.ie

Dublin Array
Offshore Wind Farm
Winter Survey 2019

Prepared by	Anatec Limited
Presented to	Innogy
Date	13th December 2019
Revision Number	00
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Revision Number	Date	Summary of Change
00	13th December 2019	Initial Draft
01	19th December 2019	Updates

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Abbreviations Table

Abbreviation	Definition
ABR	Alexandra Basin Redevelopment
AIS	Automatic Identification System
ARPA	Automatic Radar Platting Aid
CPA	Closest Point of Approach
ETA	Estimated Time of Arrival
E	East
EU	European Union
GT	Gross Tonnage
hrs	Hours
HSC	High Speed Craft
IMO	International Maritime Organization
kW	Kilo-watt
m	Metre
MMSI	Mobile Maritime Service Identity
N	North
NE	North East
NNE	North North East
NW	North West
nm	Nautical Mile (1nm = 1,852m)
NRA	Navigational Risk Assessment
OWF	Offshore Wind Farm
RNLI	Royal National Lifeboat Institute
ROPAX	Roll-on/Roll-off Passenger
Ro-Ro	Roll-on/Roll-off
S	South
SAR	Search and Rescue
SE	South East
SW	South West
VHF	Very High Frequency

Abbreviation	Definition
W	West
WGS84	World Geodetic System 1984

1 Introduction

As part of the Navigation Risk Assessment (NRA) process for the proposed Dublin Array Offshore Wind Farm (OWF), marine traffic survey data is being gathered for the area surrounding the proposed development.

This report presents analysis of a shore based survey which has been carried out from the Baily Lighthouse (Howth), between the 8th and 22nd November 2019. The marine traffic survey data has been recorded via Radar, Automatic Identification System (AIS) and visual observations by the on-site surveyors.

2 Survey Setup

A marine traffic survey of the area around the proposed Dublin Array OWF was carried out to collect 14 days of seasonal marine traffic survey data in proximity to the proposed site.

The marine traffic survey began at approximately 1500 hours (hrs) on the 8th November 2019 and concluded at 1500hrs on 22nd November 2019.

The primary objective of the survey was to identify and validate the routeing of vessels and the level of vessel activity within a 10 nautical mile (nm) 'study area' around the proposed site. This was achieved by recording, in real time, the positions of vessels within range of the AIS receiver and Automatic Radar Plotting Aid (ARPA), supplemented by observation of vessels within visual range to obtain information on type and size where the information was not available from AIS.

2.1 Survey Location

The Radar and AIS were set up at co-ordinates 53° 21.690 North (N), 006° 03.138 West (W) (World Geodetic System 1984 (WGS84)), approximately 4.9nm from the proposed Dublin Array. The survey site was located directly on the coastline offering good line of sight of the survey area (i.e., the Dublin Array OWF and surrounding waters).

Given the position of the survey site north west of the Dublin Array OWF, the southern and eastern extents of the study area may have observed reduced coverage based on proximity to the survey equipment. Therefore, to provide as comprehensive coverage of the study area as was practical, the AIS data recorded during the survey has been supplemented with additional data recorded from onshore receivers (data acquired by Anatec) located along the coastline and over the same time period.

Figure 2.1 presents an overview of the survey location, the location of the proposed Dublin Array OWF, and the study area. Figure 2.2 then presents a detailed overview of the proposed Dublin Array OWF.

It is noted that while the survey has primarily been undertaken for assessment of the site (array area); the export cable corridor (within which the export cables will be laid) lies within the 10nm study area considered. This is shown in Figure 2.1 and Figure 2.2.

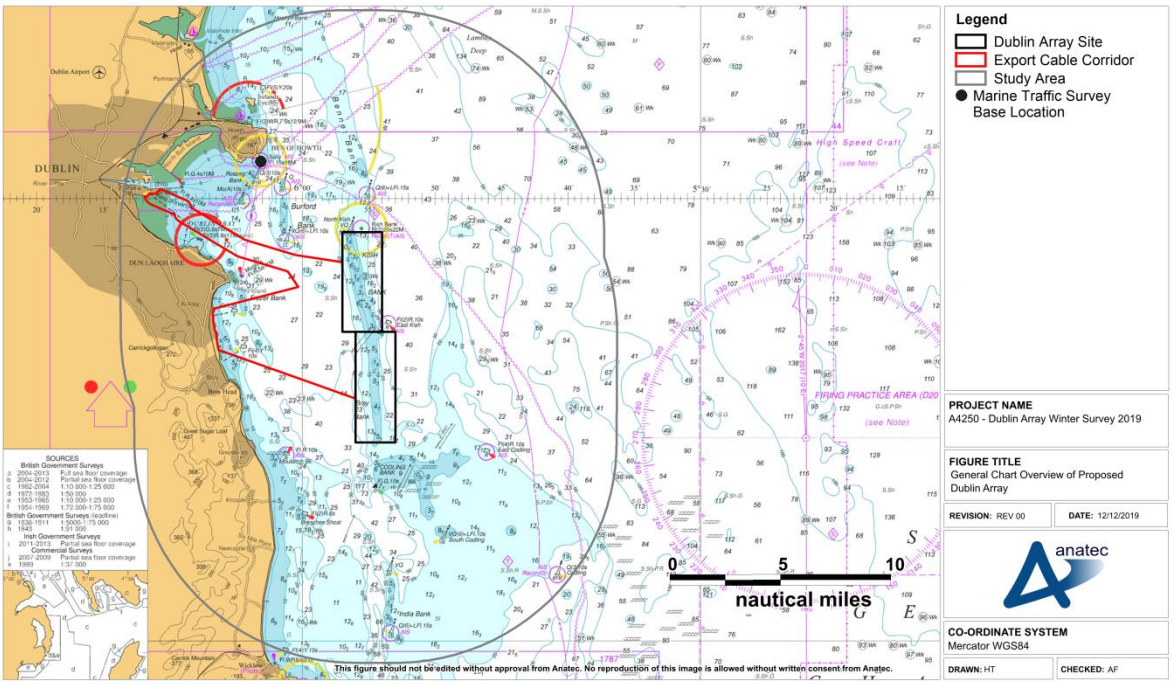


Figure 2.1 General Chart Overview of Proposed Dublin Array

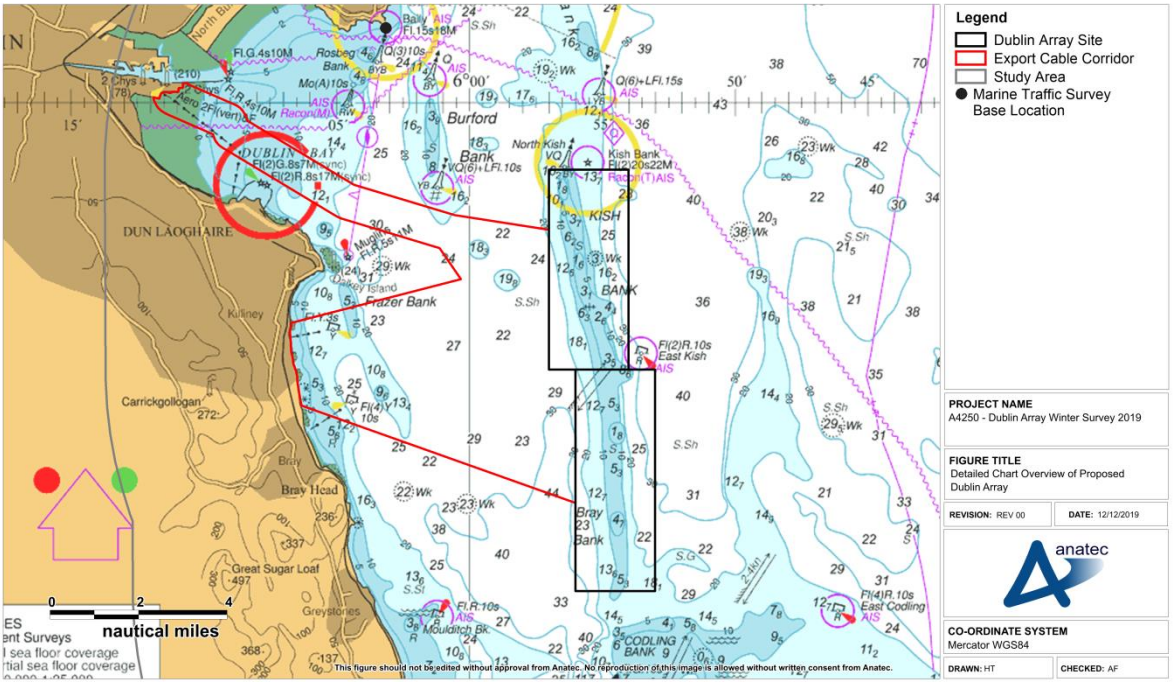


Figure 2.2 Detailed Chart Overview of Proposed Dublin Array

Reliable radar coverage was observed to extend approximately 15nm south and east of the survey site, noting that vessels were able to be tracked further than this in certain cases. It is noted that this varies with atmospheric conditions and sea conditions. Figure 2.3 shows approximate reliable radar coverage within the study area.

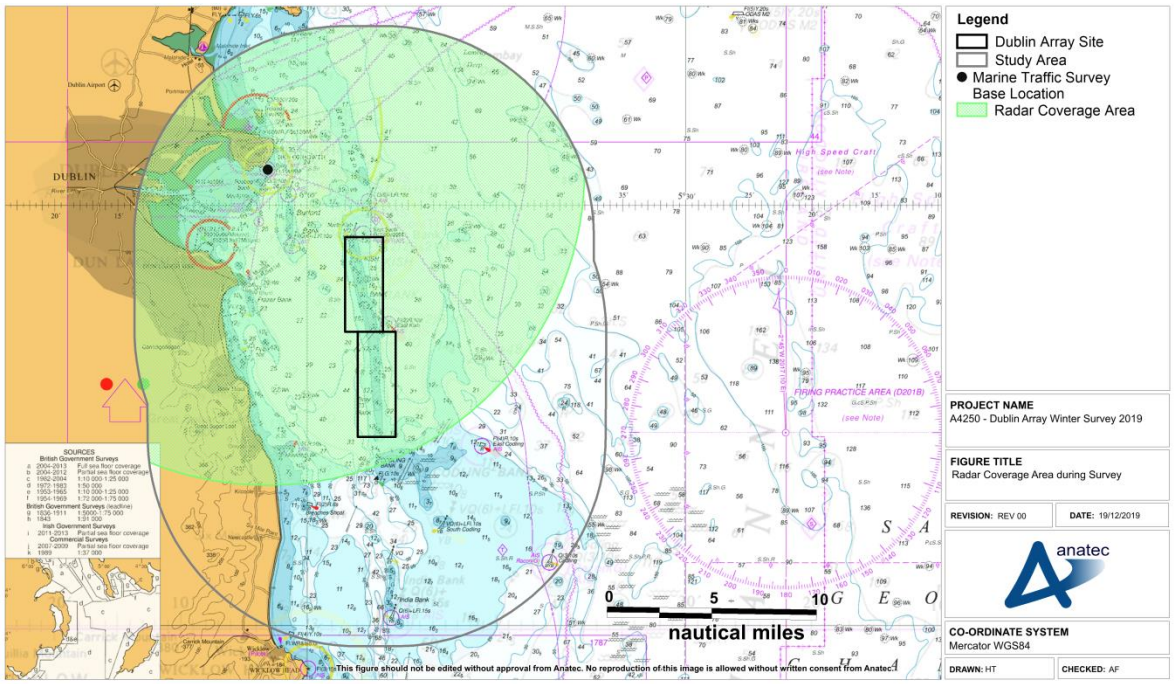


Figure 2.3 Approximate Area of Radar Coverage

2.2 Equipment and Manning

Table 2-1 lists the equipment used to carry out the traffic survey.

Table 2-1 Equipment Utilised in Traffic Survey

Equipment	Purpose
Furuno 2117 12 kilo-watt (kW) Black Box Radar with 4ft Scanner and ARPA with integrated AIS	Tracking of targets (manually and automatically) typically up to 12nm from the survey location.
Furuno GP-32	Global Positioning System used to determine the position of the survey and to input the information to the Radar system.
Nautical Compass	Used to verify heading.
Monk Nautilus 7 x 50 Marine Binoculars & Nikon Spotting Scope (20-60x zoom)	Visual identification of vessels.
Digital Camera	Photographic evidence of targets (when possible).

Equipment	Purpose
Furuno 2117 12 kilo-watt (kW) Black Box Radar with 4ft Scanner and ARPA with integrated AIS	Tracking of targets (manually and automatically) typically up to 12nm from the survey location.
Furuno GP-32	Global Positioning System used to determine the position of the survey and to input the information to the Radar system.
AIS Receiver and Very High Frequency (VHF) Antenna	To receive and record data from vessels transmitting AIS data. Tracks vessels fitted with AIS (majority of vessels > 300 Gross Register Tonnage) within a range of typically 20nm.
Notebook Personal Computers	Connected to Radar and AIS receiver for real-time recording of tracked target data. Tracked targets displayed on hydrographic charts and can be replayed at high speed when required.
Logbook	Written log of all manual targets acquired during survey as well as other notes such as visual identification information, weather conditions, etc.

The AIS system tracked targets 24 hours per day during the survey period. The Radar was manned between 06:30hrs and 23:30hrs with targets not on AIS acquired manually. During this manned period a visual lookout was maintained and all observations were recorded in the logbook. Between 23:30hrs and 06:30 hrs Radar targets were acquired automatically by the Radar, over an area defined by the watch-keepers, which encompassed the study area. Where possible, radar data was matched to AIS in order to gather better data on each vessel.

2.3 AIS Description

AIS equipment is required to be fitted on all vessels of 300 gross tonnage (GT) and upwards engaged on international voyages, cargo vessels of 500 GT and upwards not engaged on international voyages, and passenger vessels irrespective of size, built on or after 1st July 2002. All European Union (EU) registered fishing vessels of length 15 metres (m) and above are also required to carry AIS equipment by EU Directive. Smaller fishing vessels (below 15m) as well as recreational craft are not required to carry AIS but a proportion does so voluntarily. It is also noted that military vessels are not obliged to broadcast on AIS at all

times. Therefore, these vessels (e.g. fishing, recreational and military vessels) may be under-reported within the AIS data.

Both dynamic and static information are transmitted via AIS. Table 2-2 presents the dynamic and static data provided via AIS, as well as voyage related information.

Table 2-2 AIS Information

Static	Dynamic	Voyage related
▪ Mobile Maritime Service Identity (MMSI) ▪ International Maritime Organization (IMO) Number ▪ Call Sign ▪ Name ▪ Length and Beam ▪ Vessel Type ▪ Type of Navigation Sensor	▪ Position (Lat/Long) ▪ Time ▪ Course Over Ground ▪ Speed Over Ground ▪ Heading ▪ Navigational Status ▪ Rate of Turn	▪ Draught ▪ Hazardous Cargo (type) ▪ Destination ▪ ETA ▪ Route Plan

3 Weather and Tidal Data

The weather was recorded in the survey logbook (at the survey base) approximately every 6 hrs and is presented in Table 3-1.

During the survey, daylight hours were typically between 08:00hrs and 16:30hrs. Wind speed during the survey varied with an average Beaufort Force of 4. The highest Beaufort wind force scale was 6-7, recorded on the 11th November 2019.

Throughout the survey visibility was most commonly around 6nm. The sea state varied from slight to rough throughout the survey period. During the periods of reduced visibility recorded throughout the survey, the ability to visually observe targets was reduced. This meant that targets could be recorded but that identification of the type of vessel may not be possible (see section 4.1).

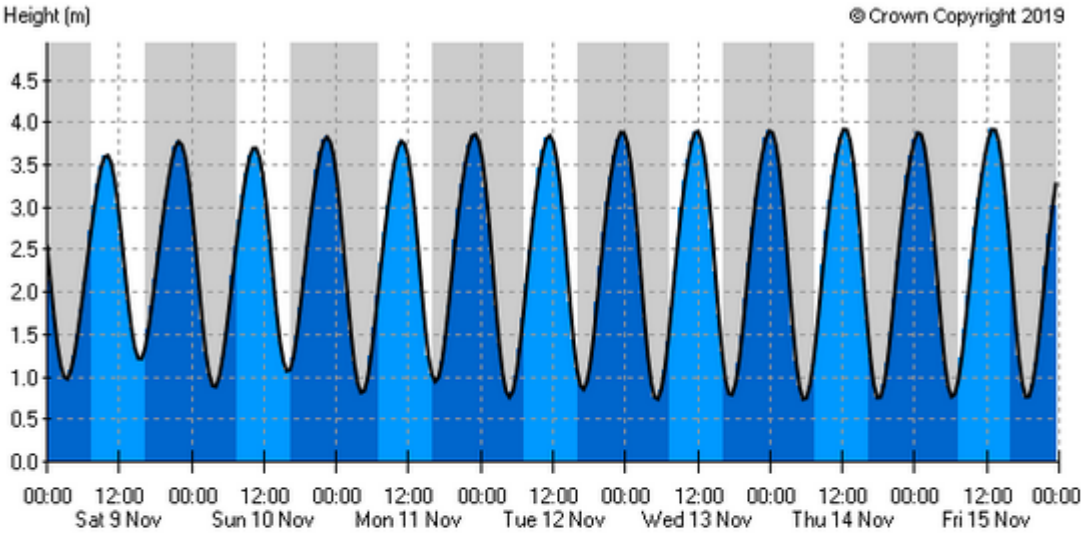
Figure 3.1 and Figure 3.2 present tidal predictions for Dun Laoghaire during the survey period. Dun Laoghaire was the closest source of tidal data to the survey location. Tidal heights were predicted to range from 0.7m to 4.0m, remaining consistent throughout the survey period.

Table 3-1 Weather Throughout 14 Day Survey Period

Date	Time	Wind Direction	Wind Speed (Beaufort Scale)	Sea State	Visibility (nm)	Comments
8th Nov	1800	North East (NE)	2/3	Slight	> 8	4/8 cloud
	0000	NE	2/3	Slight	> 8	4/8 cloud
9th Nov	0630	North (N)	4/5	Slight	2	Heavy rain
	1200	N	3/4	Smooth	6	Overcast, drizzle
	1800	N	4/5	Windy	1.5	Thunder/lightning, heavy rain
	0000	NE	5/6	No visual	1-2	Very windy, rain
10th Nov	0630	North West (NW)	3/4	Slight	6	Overcast
	1200	South (S)	3	Slight	10	7/8 cloud
	1800	S	4/5	Slight	1-2	Windy, dry
	1130	S	4/5	White	2-3	Very windy, slight haze

Date	Time	Wind Direction	Wind Speed (Beaufort Scale)	Sea State	Visibility (nm)	Comments
11th Nov	0630	S	5	Moderate	> 8	Cloud 3/8
	1200	S	6/7	Moderate/ rough	6	0/8 cloud, bright sun
	1800	S	3/4	Moderate	1-2	Dark, dry, no rain
	1130	S	2/3	Moderate	3-4	Full moon, dry, clear
12th Nov	0600	S	4	Moderate	8	7/8 cloud
	1200	South West (SW)	3/4	Slight	> 8	4/8 cloud, bright sun
	1800	S	1	Calm	6-7	Bright, calm
	1130	S	1	Calm	6-7	Full moon, bright and calm
13th Nov	0630	South East (SE)	2/3	Slight	6-7	Overcast
	1200	E	3/4	Slight/Moderate	6-7	Overcast, Rain in sight
	1800	SE	5/6	Heavy swell	0.5-1	Extremely windy, heavy rain
	1130	S	4/5	Heavy swell	2	Very windy, dry
14th Nov	0630	North North East (NNE)	4/5	Moderate/Rough	6-7	Overcast, light rain
	1200	NE	7/8	Rough	6-7	Cloud 6/8, bright
	1800	N	4/5	Moderate	4-5	Overcast, dry, windy
	1130	N	4/5	Moderate	5-6	Dry, bright moon
15th Nov	0630	SW	3/4	Slight/moderate	6-7	Overcast, damp
	1200	NE	3/4	Moderate	6-7	Overcast
	1800	N	2/3	Moderate	0.5-1	Dry, windy, very dark
	1130	N	2/3	Moderate	1-2	Overcast, damp, cold
16th Nov	0630	NW	3	Slight	8	Overcast, cold
	1200	NW	2	Slight	> 8	7/8 cloud

Date	Time	Wind Direction	Wind Speed (Beaufort Scale)	Sea State	Visibility (nm)	Comments
	1800	NW	2	Slight	1-2	Dry
	1130	NW	1	Calm	2-3	Dry, no wind, cold
17th Nov	0630	NW	2	Calm	> 8	3/8 cloud, cold
	1200	NW	3	Slight	> 8	3/8 cloud, bright
	1800	N	1/2	Calm	3-4	Dry, cold
	1130	N	1/2	Slight	1-2	Dry, very dark, cold
18th Nov	0630	N	1/2	Calm	> 8	5/8 cloud, cold
	1200	NW	1/2	Calm	> 8	3/8 cloud, bright sunlight
	1800	N	1/2	Calm	4	Cold and dry, no cloud
	1130	N	1/2	Calm	1-2	Dry, cold
19th Nov	0630	SE	2/3	Slight	>8	7/8 cloud
	1200	S	5/6	Rough	< 4	Rain showers
	1800	S	3/4	Rough	1-2	Dry, cold, very dark
	1130	S	3/4	No visual	Nil	Very dark, dry not cold
20th Nov	0630	S	4/5	Moderate/rough	5	Rain
	1200	SE	5	Rough	6	Overcast
	1800	SE	5	Rough	1-2	Windy, dark
	1130	SE	5/6	No visual	Nil	Very windy, dry
21st Nov	0630	SE	5/6	Rough	6	Rain
	1200	SE	4	Moderate/rough	8	Overcast
	1800	SE	4/5	Rough	3-4	Windy, dry
	1130	SE	5	Rough	~500 yards	Windy and rainy
22nd Nov	0630	East (E)	3	Moderate	6	Light rain
	1200	E	4/5	Moderate	6	Overcast, rain showers
	1500	E	4	Moderate/rough	4	Overcast, rain showers



Note: the date shown underneath 12:00 on any given day is applicable to the previous and next periods of 12 hours

Sat 9 Nov			
LW	HW	LW	HW
03:12	09:54	15:25	21:54
1.0 m	3.6 m	1.2 m	3.8 m

Sun 10 Nov			
LW	HW	LW	HW
03:46	10:26	15:59	22:26
0.9 m	3.7 m	1.1 m	3.8 m

Mon 11 Nov			
LW	HW	LW	HW
04:16	10:54	16:28	22:56
0.8 m	3.8 m	0.9 m	3.9 m

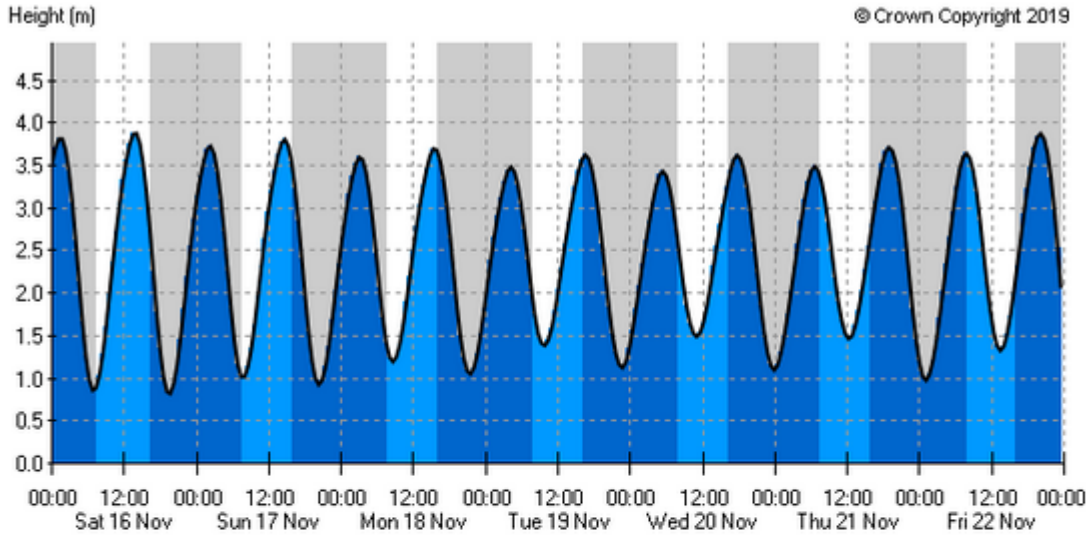
Tue 12 Nov			
LW	HW	LW	HW
04:43	11:21	16:56	23:27
0.8 m	3.8 m	0.9 m	3.9 m

Wed 13 Nov		
LW	HW	LW
05:10	11:51	17:26
0.7 m	3.9 m	0.8 m

Thu 14 Nov			
HW	LW	HW	LW
00:01	05:40	12:25	18:01
3.9 m	0.7 m	3.9 m	0.7 m

Fri 15 Nov			
HW	LW	HW	LW
00:41	06:15	13:03	18:40
3.9 m	0.8 m	3.9 m	0.8 m

Figure 3.1 Tidal Predictions for Dun Laoghaire 9th – 15th November 2019



Note: the date shown underneath 12:00 on any given day is applicable to the previous and next periods of 12 hours

Sat 16 Nov			
HW	LW	HW	LW
01:24	06:54	13:46	19:25
3.8 m	0.9 m	3.9 m	0.8 m

Sun 17 Nov			
HW	LW	HW	LW
02:12	07:39	14:34	20:17
3.7 m	1.0 m	3.8 m	0.9 m

Mon 18 Nov			
HW	LW	HW	LW
03:06	08:32	15:28	21:21
3.6 m	1.2 m	3.7 m	1.1 m

Tue 19 Nov			
HW	LW	HW	LW
04:08	09:39	16:31	22:35
3.5 m	1.4 m	3.6 m	1.1 m

Wed 20 Nov			
HW	LW	HW	LW
05:19	10:58	17:42	23:50
3.4 m	1.5 m	3.6 m	1.1 m

Thu 21 Nov		
HW	LW	HW
06:34	12:16	18:55
3.5 m	1.5 m	3.7 m

Fri 22 Nov			
LW	HW	LW	HW
00:58	07:43	13:23	20:01
1.0 m	3.6 m	1.3 m	3.9 m

Figure 3.2 Tidal Predictions for Dun Laoghaire 16th – 22nd November 2019

4 Survey Results

This section presents the vessel tracks recorded on AIS and Radar within 10nm of the Dublin Array OWF during the 14 day survey period.

In any instance of a vessel being recorded via both AIS and Radar, the track providing the most complete coverage has been utilised. In the majority of such cases the AIS track was observed to be superior to that of the Radar. Figure 4.1 shows all the data recorded, colour coded by recording source (i.e., AIS, Radar, visual observation).

Vessels shown in Figure 4.1 detailed as being recorded via "visual observation" were any non-AIS vessels that were unable to be manually acquired via radar. Further details of these vessels are available in Section 4.10. It is noted that any analysis in this section not dependent on geographic information (e.g., daily counts) has accounted for the vessels recorded via visual observation.

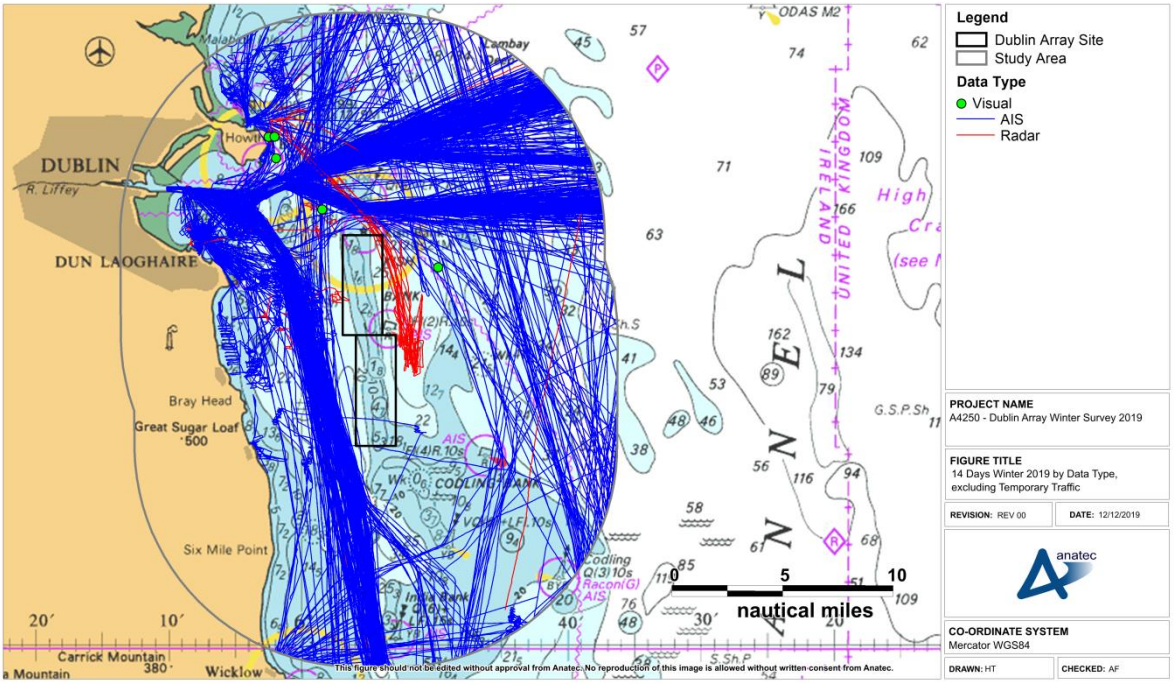


Figure 4.1 14 Days Winter 2019 by Data Type (AIS and Radar), excluding Temporary Traffic

Marine Aggregate Dredgers associated with the Alexandra Basin Redevelopment (ABR) Project were observed within the data recorded dumping spoil. This activity is due to be completed by March 2020, and as such it does not represent "routine" traffic. The tracks have therefore been excluded from the main analysis, but are shown in Figure 4.2 for reference noting that further dredging may be required for the ABP project.

Further, to ensure vessels moored at local harbours did not skew the analysis, tracks observed to remain entirely within Dublin Harbour and the Dun Laoghaire Marina have also been excluded. The excluded areas are indicated in Figure 4.3.

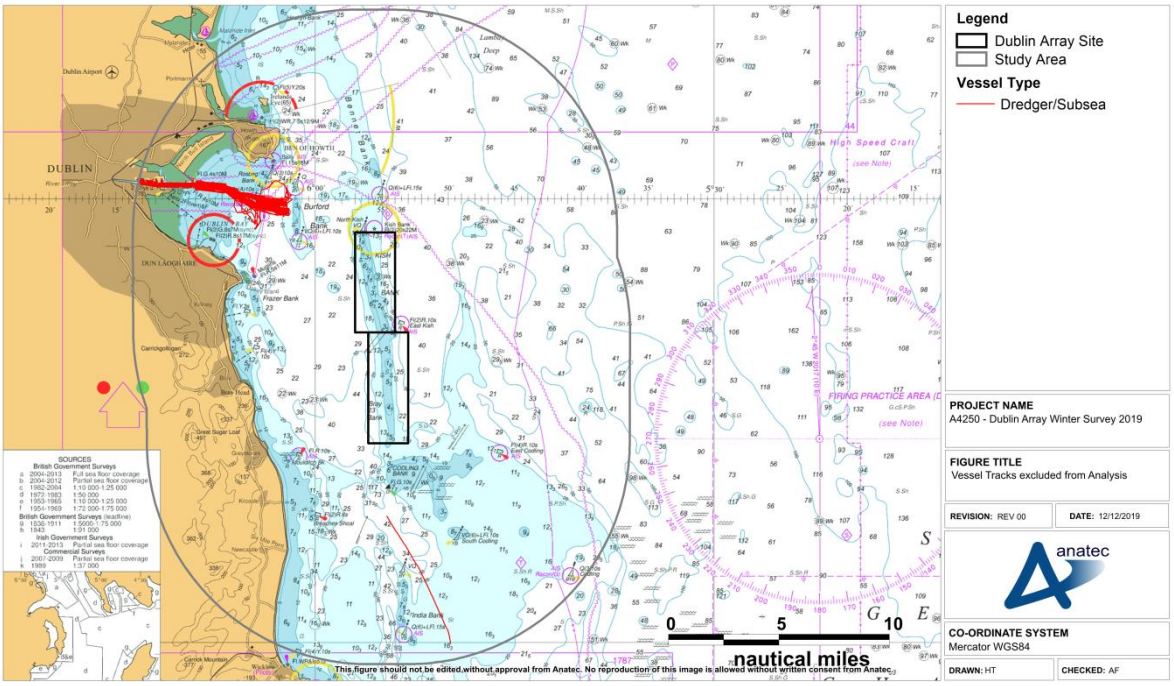


Figure 4.2 Vessel Tracks excluded from Analysis

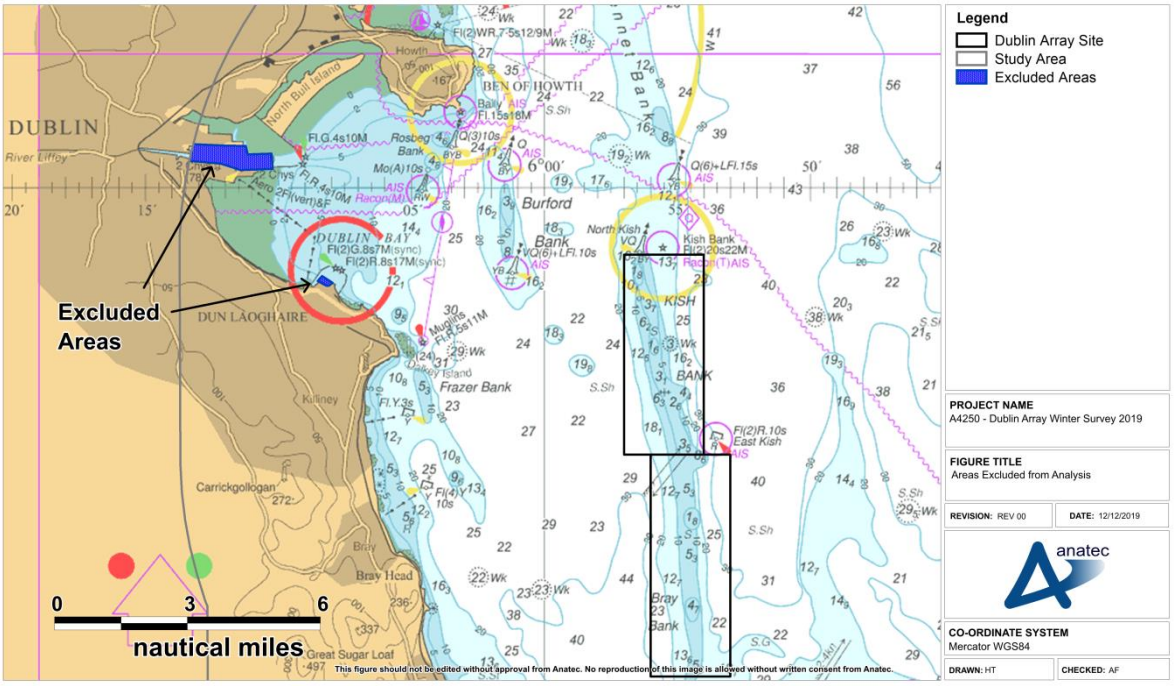


Figure 4.3 Areas Excluded from Analysis

4.1 Vessel Types

An overview of the data recorded throughout the survey period colour-coded by vessel type is presented in Figure 4.4. It is noted that where a vessel was recorded solely via Radar, type information could only be ascertained where the vessel was able to visually identified at the

time of recording. Such tracks which could not be assigned a type category accounted for a minority of cases (less than 1%), noting that all vessels recorded by AIS were able to be assigned into a type category based on the information transmitted.

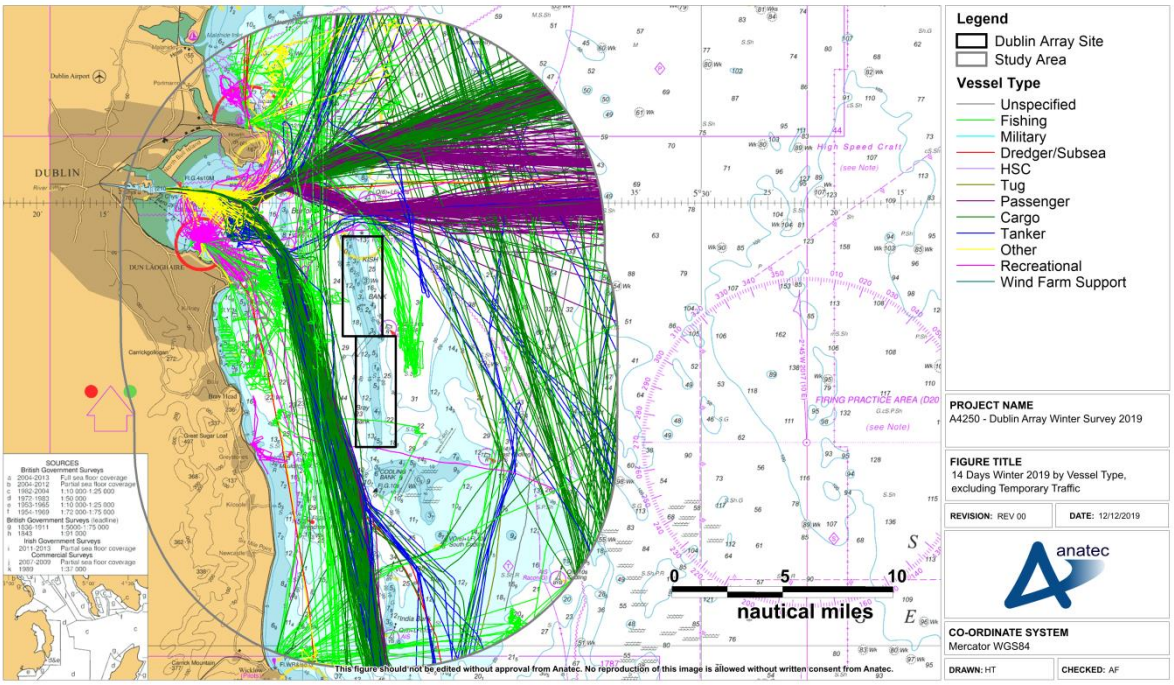


Figure 4.4 14 Days Winter 2019 by Vessel Type, excluding Temporary Traffic

The distribution of vessel types recorded within the study area during the survey period is presented in Figure 4.5. For the purposes of this figure, unspecified vessels, high speed craft (HSC) and wind farm support vessels[1] have been grouped into the "Other" category, given that they comprised a very limited proportion of traffic (less than 1% when combined).

[1] One wind farm support vessel was recorded just within the study area before exiting again. This vessel operates at Arklow Bank Wind Park to the south of the survey site.

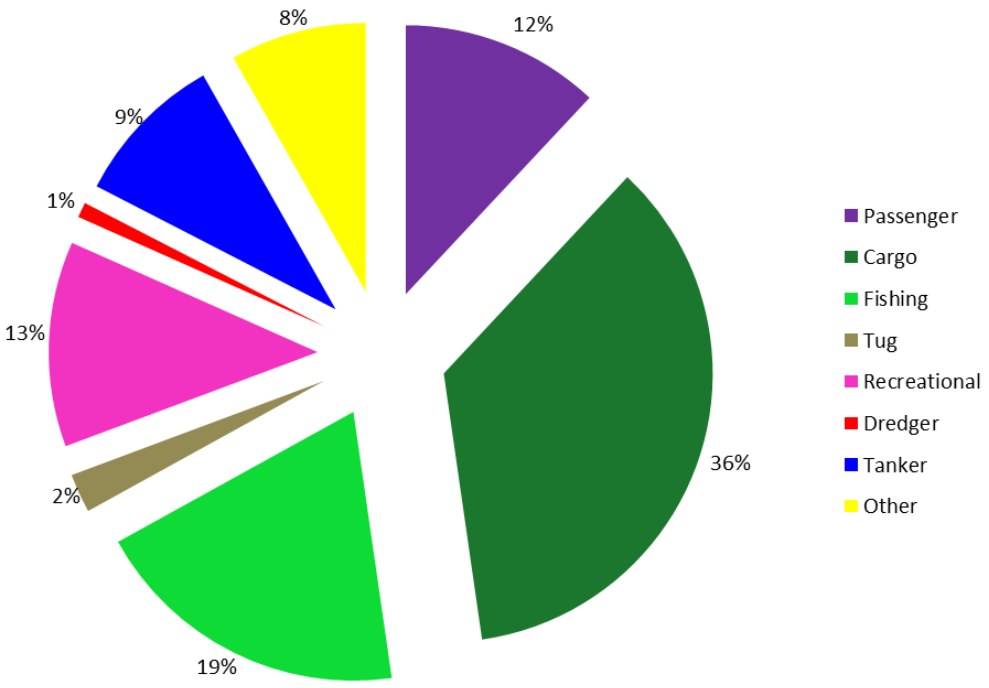


Figure 4.5 Distribution of Vessel Types within Study Area - 14 Days Winter 2019

The most common types of vessels recorded within the study area were cargo vessels (36%), fishing vessels (19%), recreational vessels (13%), passenger vessels (12%) and tankers (9%). For the purposes of this figure, the 'other' category included Royal National Lifeboat Institution (RNLI) search and rescue (SAR) vessels, survey vessels and pilot boats, as well as the aforementioned categories (in section 4.1) containing less than 1% of the total traffic.

4.2 Anchored Vessels

Figure 4.6 presents the vessels identified as being at anchor, based on the information transmitted via AIS. As can be seen, vessels were only identified as anchoring within the charted anchorage in Dublin Bay near the pilot boarding station.

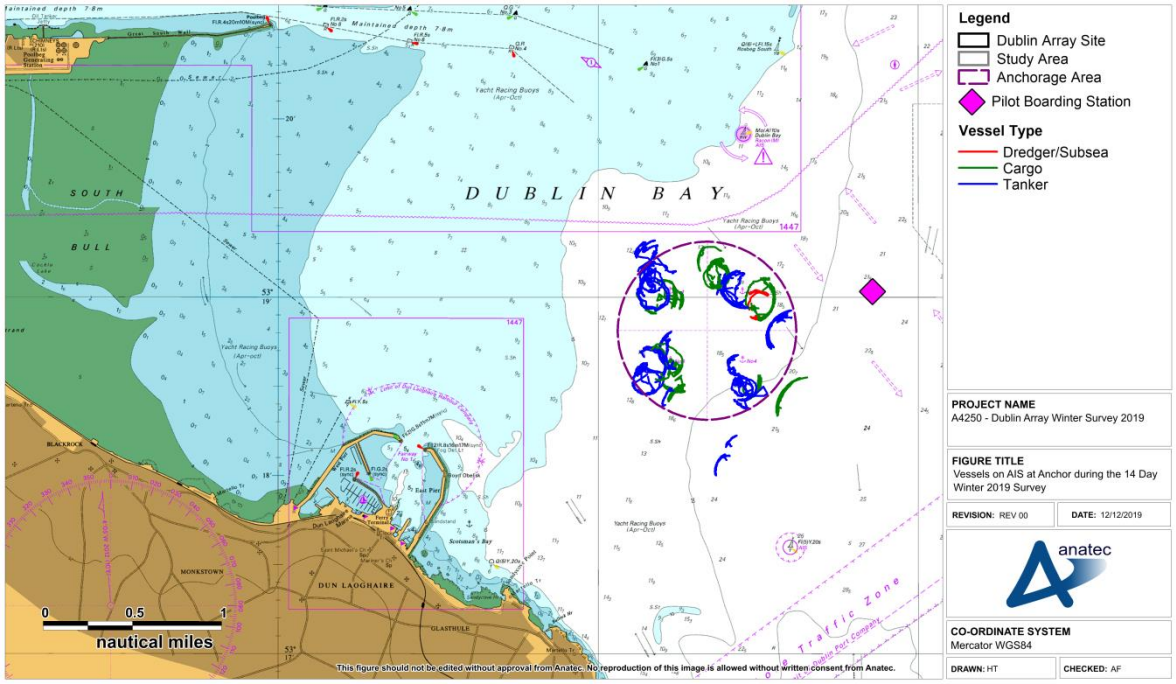


Figure 4.6 Vessels on AIS at Anchor during the 14 Day Winter 2019 Survey

4.3 Vessel Count

Figure 4.7 presents the number of unique vessels per day recorded throughout the winter survey period. On average, 52 unique vessels per day were recorded within the study area. The busiest day was the 17th November 2019 on which 79 vessels were recorded. Note that the survey began at 15:00hrs on the 8th November 2019 and ended at 15:00hrs on 22nd November so the data for these days are not representative of a complete day.

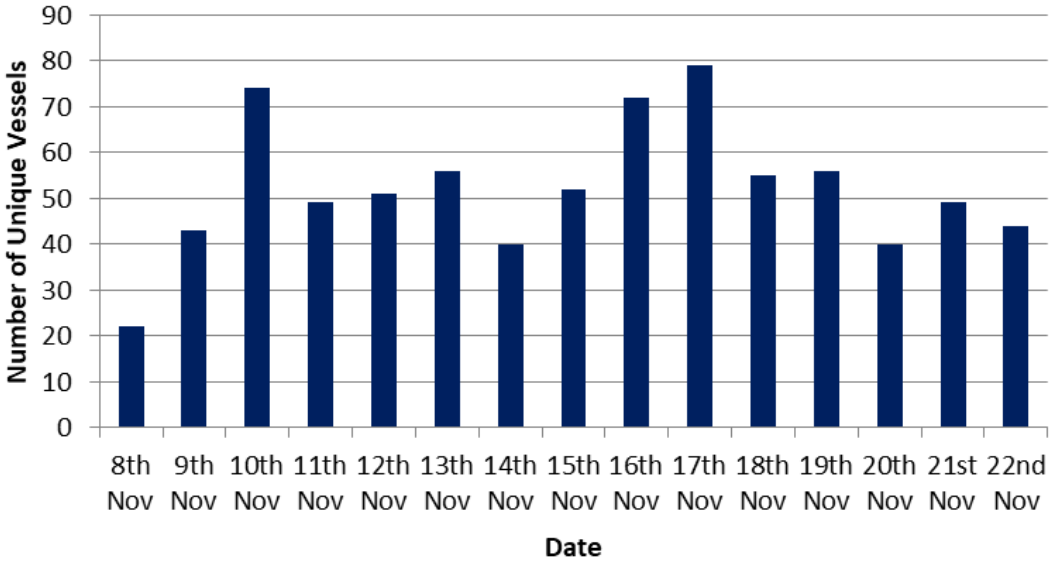


Figure 4.7 Unique Vessels per Day within Study Area - 14 Days Winter 2019

4.4 Vessel Length

Based on the information available from AIS and visual observation of the Radar targets (where possible) an overview of vessel tracks within the study area colour-coded by vessel length is presented in Figure 4.8.

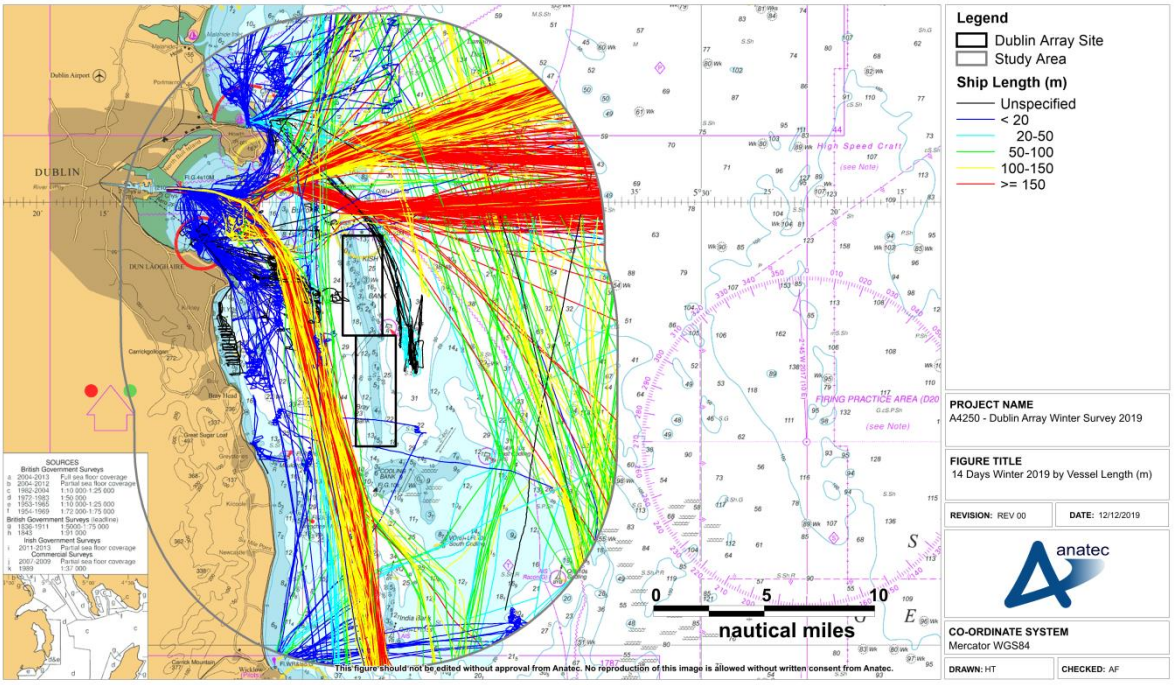


Figure 4.8 14 Days Winter 2019 by Vessel Length

Vessels of unspecified length included the vessels for which there was no AIS data available. Excluding vessels of unspecified length (6%), the average length of vessels within the study area was 92m. The longest vessel recorded transiting the study area was the 234m long cargo vessel *Celine*, which passed within 1nm of the proposed Dublin Array OWF while bound for Dublin.

Vessels operating inshore, in proximity to the proposed Dublin Array OWF were typically smaller (< 20m) vessels, while larger vessels typically transited further from the shore. The majority of vessels less than 20m were either recreational vessels (inshore) or fishing vessels.

Figure 4.9 presents the distribution of vessel lengths recorded throughout the survey period. A significant proportion of the vessels recorded during the survey were less than 20m in length (28%).

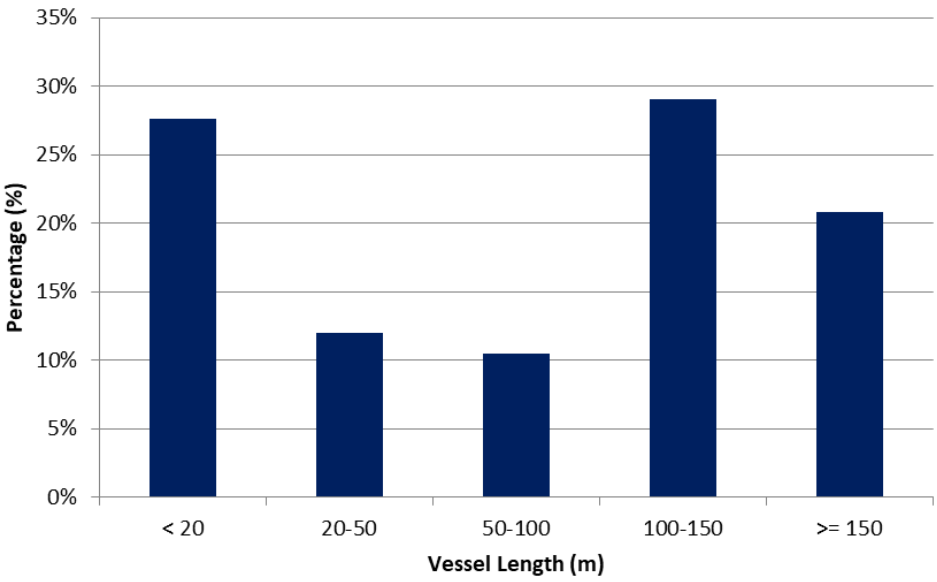


Figure 4.9 Distribution of Vessel Length within Study Area – 14 Days Winter 2019

4.5 Vessel Draught

Based on the information available from AIS an overview of vessel tracks within the study area, colour-coded by vessel draught, is presented in Figure 4.10. It should be noted that vessel draught information was not available for 32% of vessels recorded throughout the survey period (including those recorded by Radar, for which no draught information was available). The vast majority of vessels with unspecified draught were fishing vessels (43% of all unspecified draughts) while approximately 12% of unspecified draughts were associated with recreational vessels.

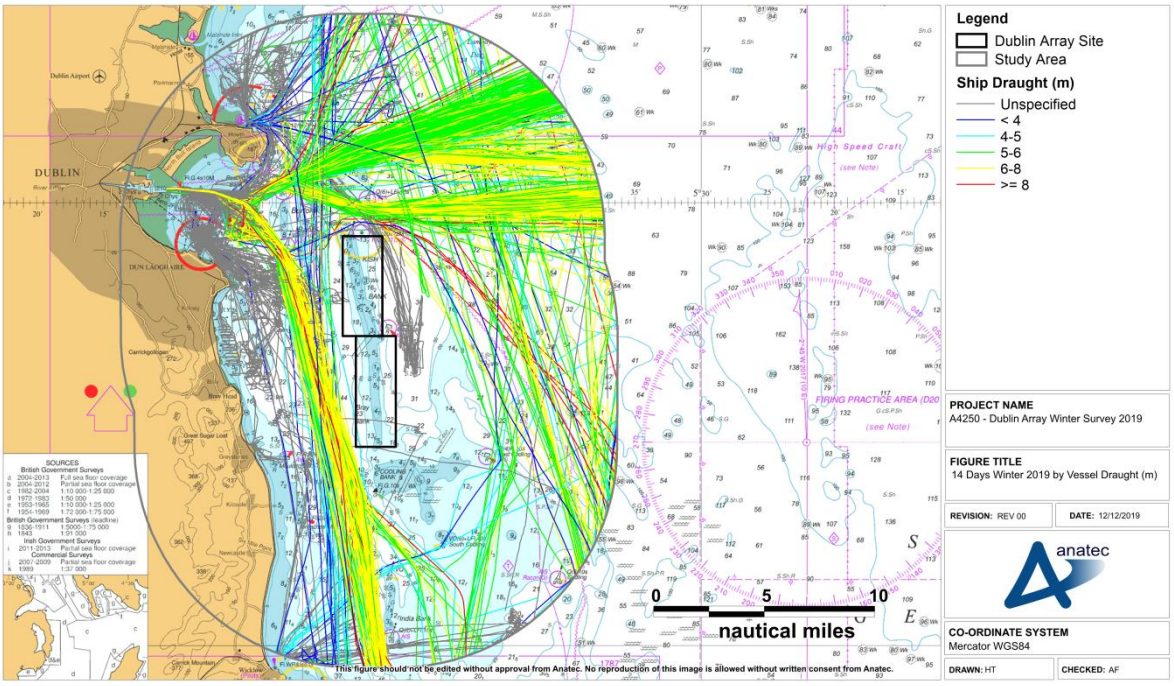


Figure 4.10 14 Days Winter 2019 by Vessel Draught (m)

The average draught of vessels within the study area was 5.6m. The deepest vessel draught recorded was 9.3m by the chemical/oil products tanker *Thun Lidkoping* which was recorded while travelling to Dublin, passing at a distance of approximately 1nm from the proposed Dublin Array.

Figure 4.11 presents the distribution of vessel draughts within the study area (excluding the vessels for which draught information was not attainable). The length ranges 5m to 6m (33%) and 6m to 8m (37%) represent the most frequently recorded draught ranges.

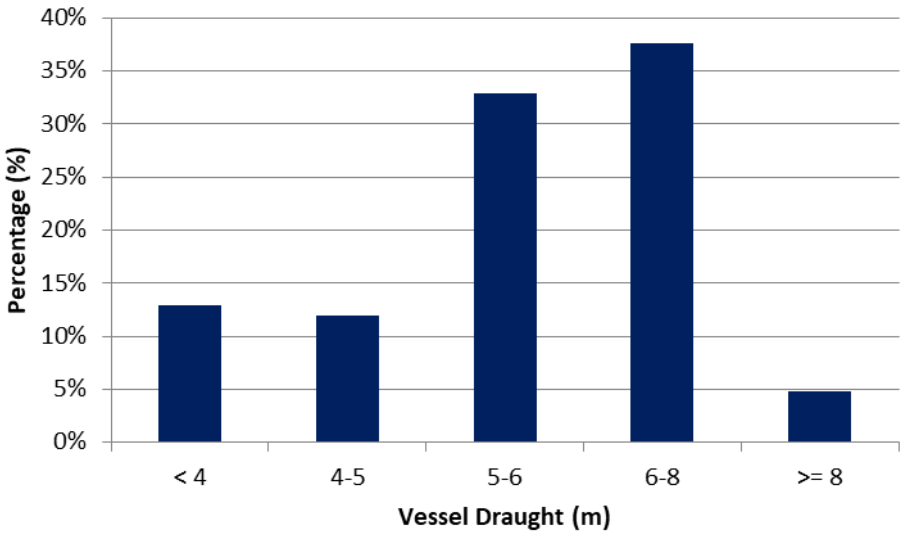


Figure 4.11 Distribution of Vessel Draught within Study Area – 14 Days Winter 2019

4.6 Vessel Course

An overview of vessel tracks within the study area colour-coded by average course is presented in Figure 4.12.

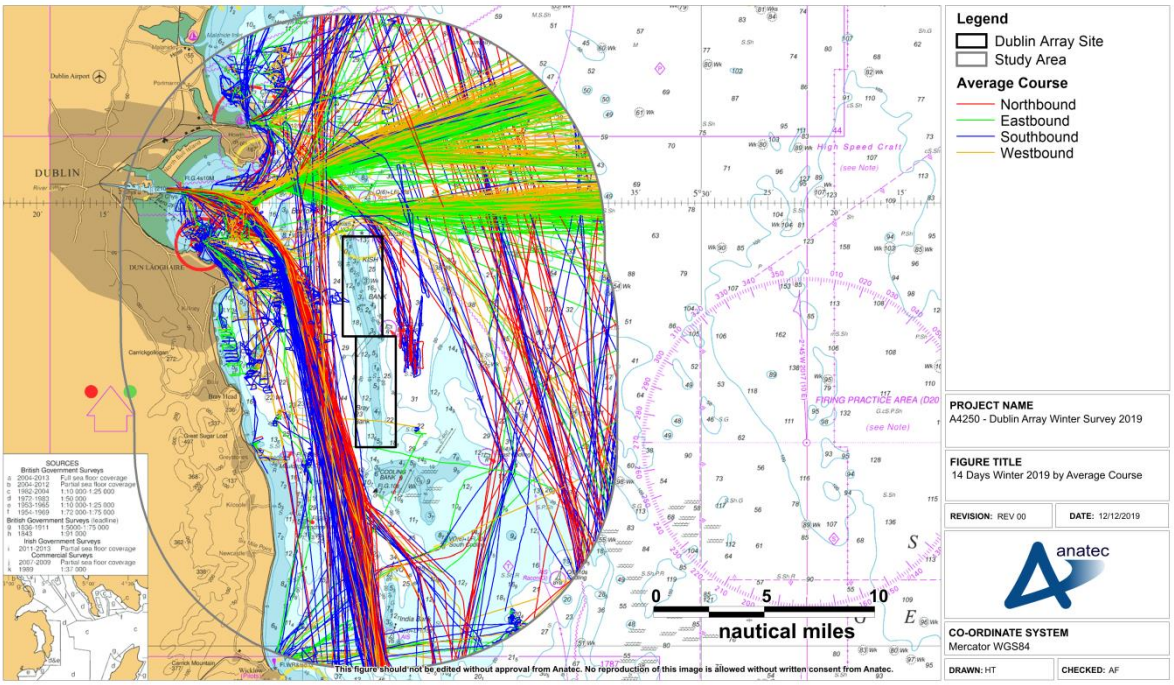


Figure 4.12 14 Days Winter 2019 by Average Course

Eastbound and westbound vessels were in the majority associated with Dublin, and comprised 27% and 29% of traffic respectively. Southbound vessels accounted for a greater proportion of traffic than northbound vessels (29% compared to 15%), however it should be considered that southbound traffic was observed to include the majority of fishing activity in the area.

4.7 Vessel Speed

Excluding vessels with unspecified speed (1%), the average speed of vessels transiting the study area was 9.2 knots. The fastest recorded vessel was the Roll-on/Roll-off (Ro-Ro) passenger vessel *Epsilon*, which was recorded at a speed of 24.2 knots on the 16th November 2019.

The distribution of vessel speed is presented in Figure 4.13.

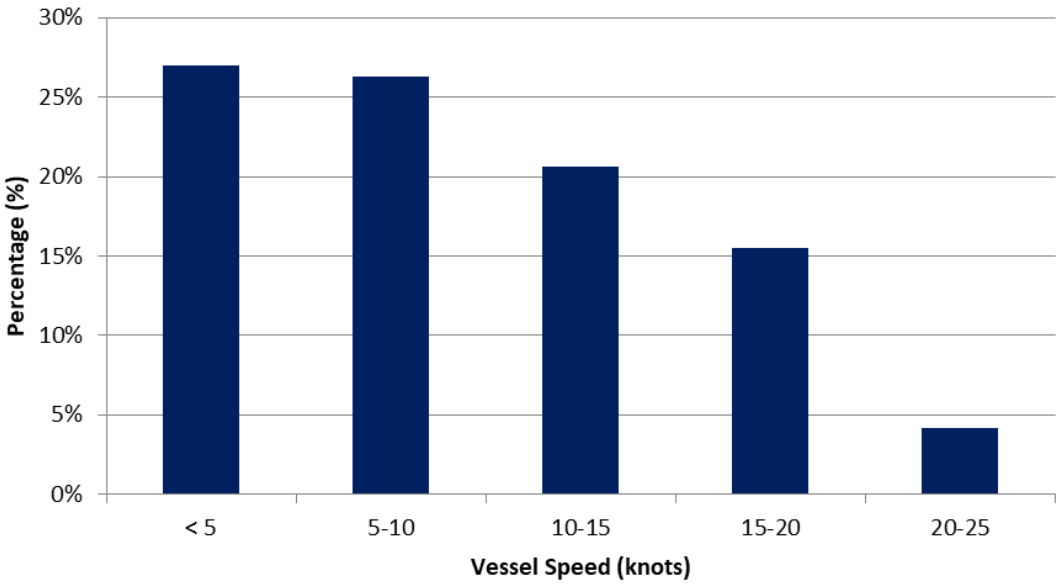


Figure 4.13 Vessel Speed Distribution within the Study Area – 14 Days Winter 2019

4.8 Vessel Destinations

Vessel destination data is broadcast over AIS, and on this basis Figure 4.14 presents the most frequently broadcast destinations. Approximately 32% of AIS transits came from vessels that did not transmit a valid destination and such are not included.

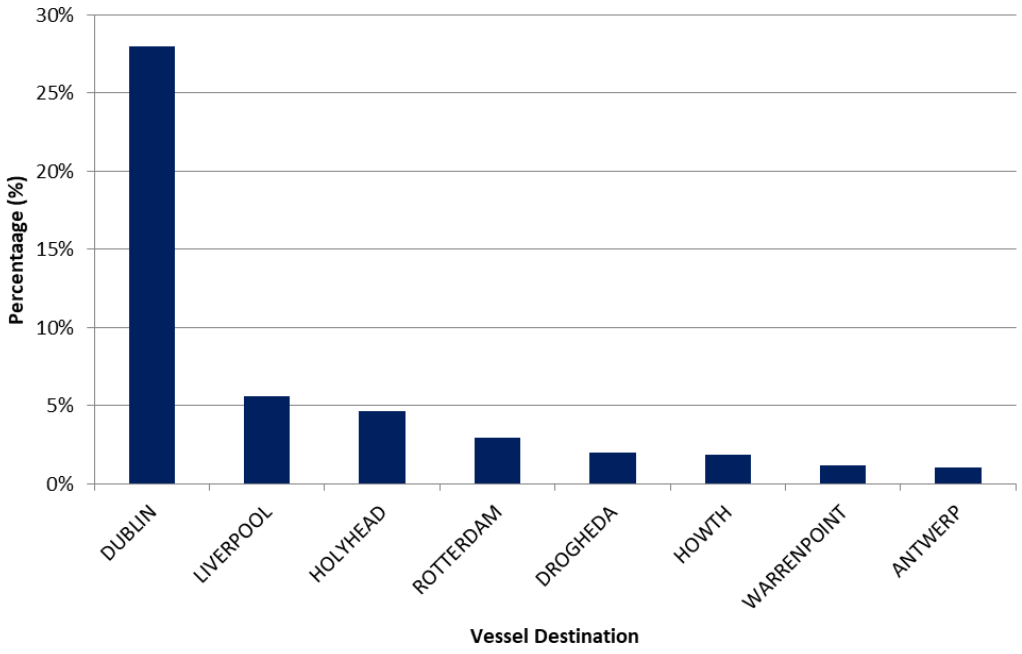


Figure 4.14 Vessel Destination Distribution within Study Area – Winter 2019

The most commonly broadcast destination was Dublin (28%). Other frequently recorded destinations were the ports of Liverpool (6%) and Holyhead (5%). Common destinations

accounting for less than 5% of the total included the ports of Rotterdam, Drogheda, Howth, Warrenpoint and Antwerp.

4.9 Vessels within 1nm of Proposed Dublin Array

For the purposes of site specific assessment, Figure 4.15 presents vessels tracks recorded within 1nm of the proposed Dublin Array OWF. Figure 4.16 then presents the distribution of vessel types within 1nm of the Dublin Array. Of the vessels recorded within 1nm of Dublin Array, 6% were recorded on Radar and 94% recorded on AIS.

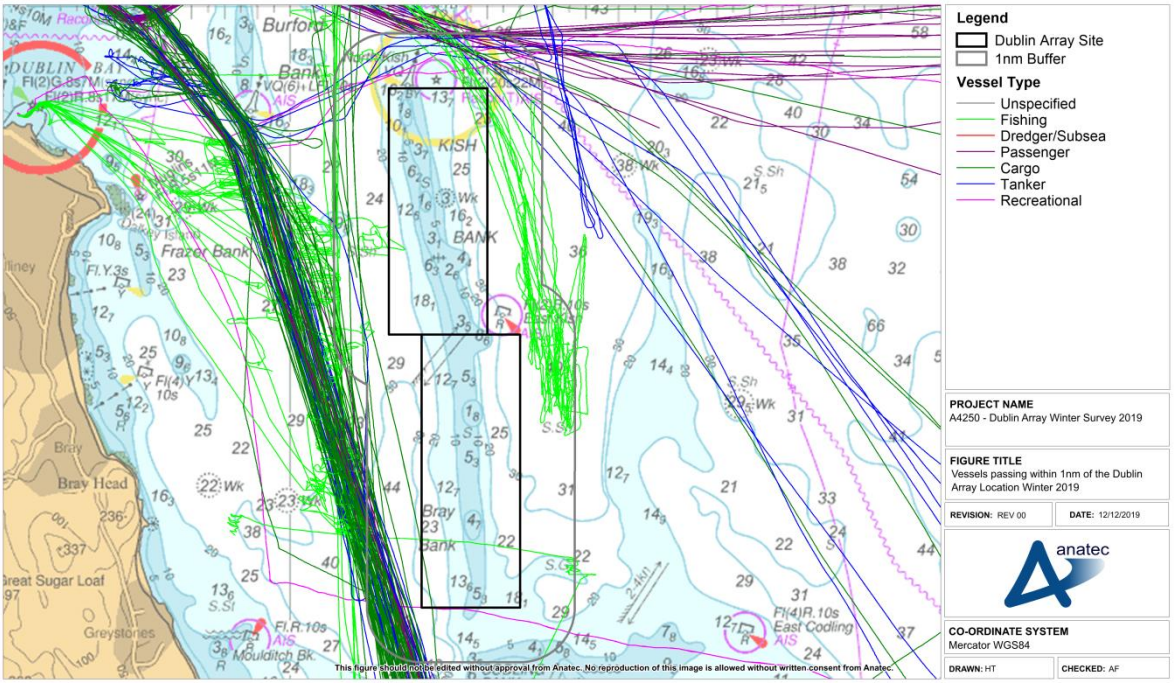


Figure 4.15 Vessels within 1nm of the Dublin Array Location Winter 2019

During the 14 day survey period on average 11 unique vessels passed within 1nm of the Dublin Array location per day. Approximately one unique vessel per day passed through the Dublin Array main development site boundary, with the majority of these being fishing vessels.

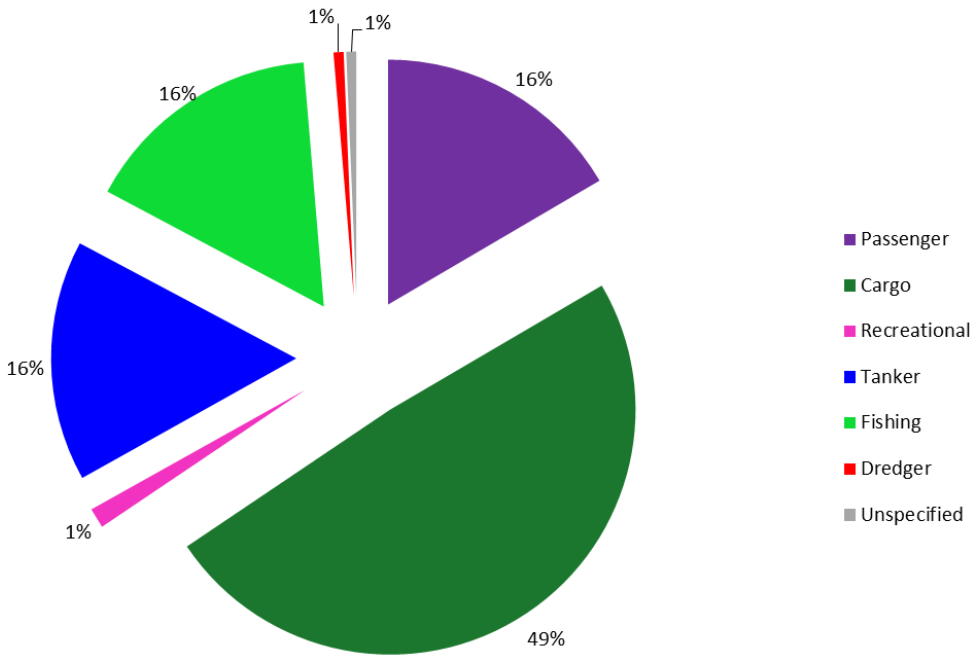


Figure 4.16 Distribution of Vessel Types within 1nm of Dublin Array Development

The majority of vessels recorded within 1nm of the Dublin Array location were cargo vessels (49%). The other significantly represented vessel types were passenger vessels (16%), tankers (16%) and fishing vessels (16%).

Figure 4.17 presents the closest point of approach (CPA) distribution of vessel tracks within 3nm of the Dublin Array main development site boundary. It is noted that vessel tracks with a CPA of 0nm are those which intersect the site boundary.

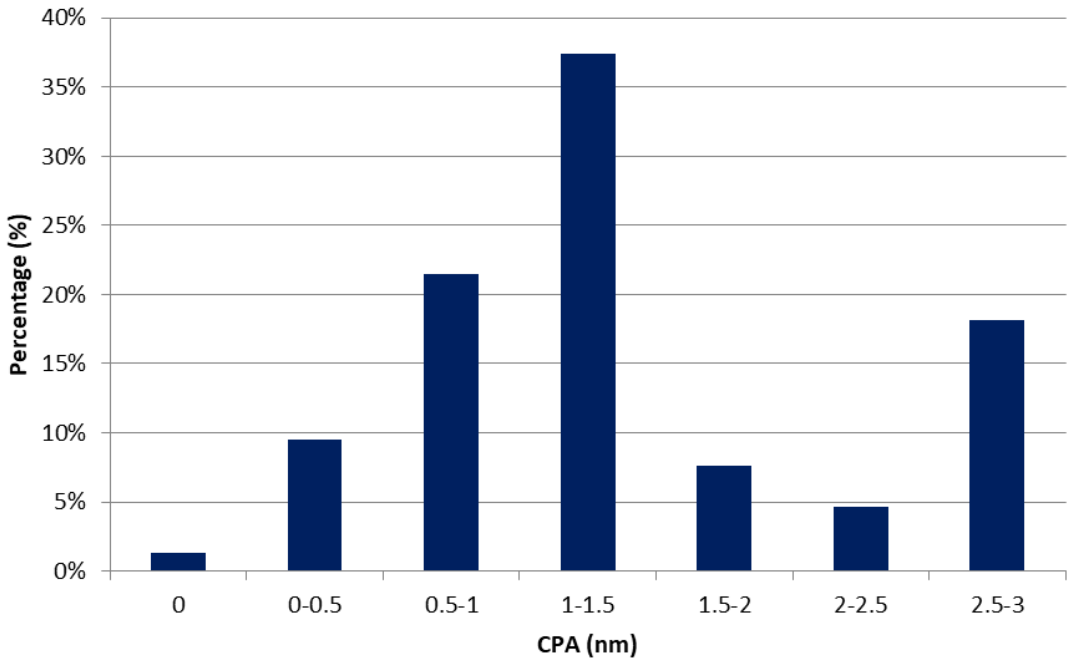


Figure 4.17 Distribution of CPA as a percentage of Vessels within 3nm of Site Boundary

Of the vessels passing within 3nm of the Dublin Array main development site boundary, approximately 1% intersected the site itself.

4.10 Visually Acquired Targets

A total of five vessels were recorded via visual observation (i.e., non-AIS vessels that could not be acquired successfully via radar) as shown in Figure 4.18. Details of each vessel are then given in Table 4-1.

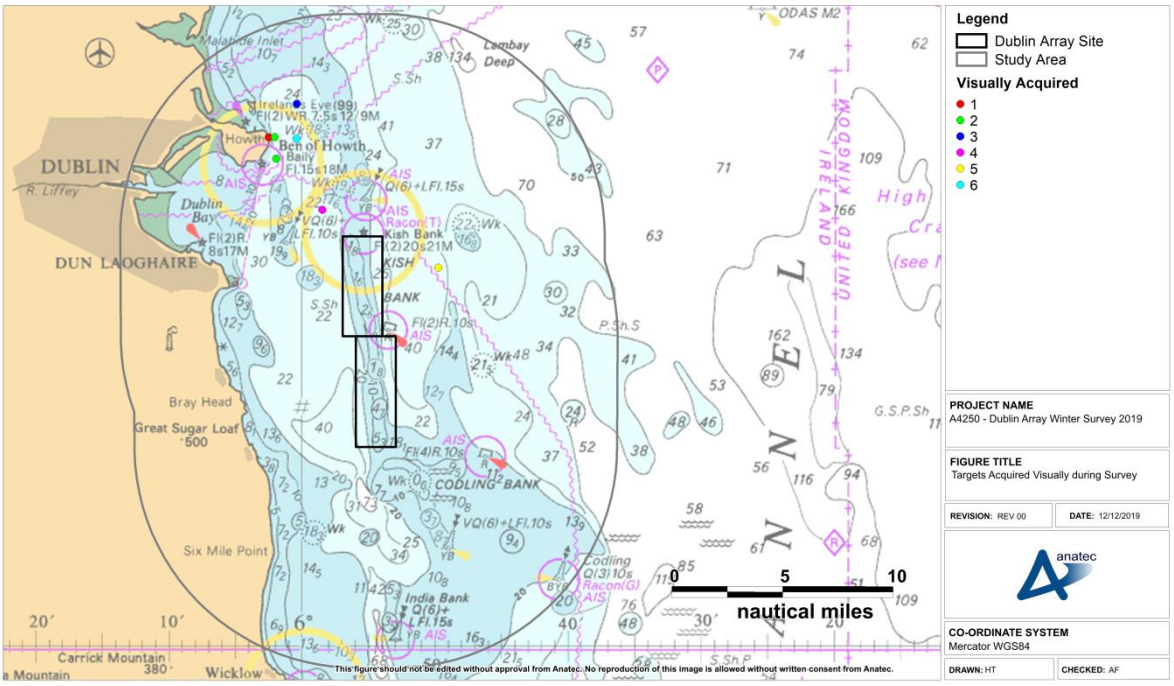


Figure 4.18 Targets Acquired Visually during Survey

Table 4-1 Visual Target Details

Vessel	Type
1	Other
2	Recreational
3	Fishing
4	Recreational
5	Unspecified
6	Fishing

5 Detailed Review by Vessel Type

5.1 Introduction

The following sub-sections present a more detailed analysis of the main vessel types recorded throughout the survey period.

5.2 Cargo Vessels

Figure 5.1 presents tracks of cargo vessels which were recorded within the study area. A total of 97 unique cargo vessels were recorded over the survey period, all via AIS.

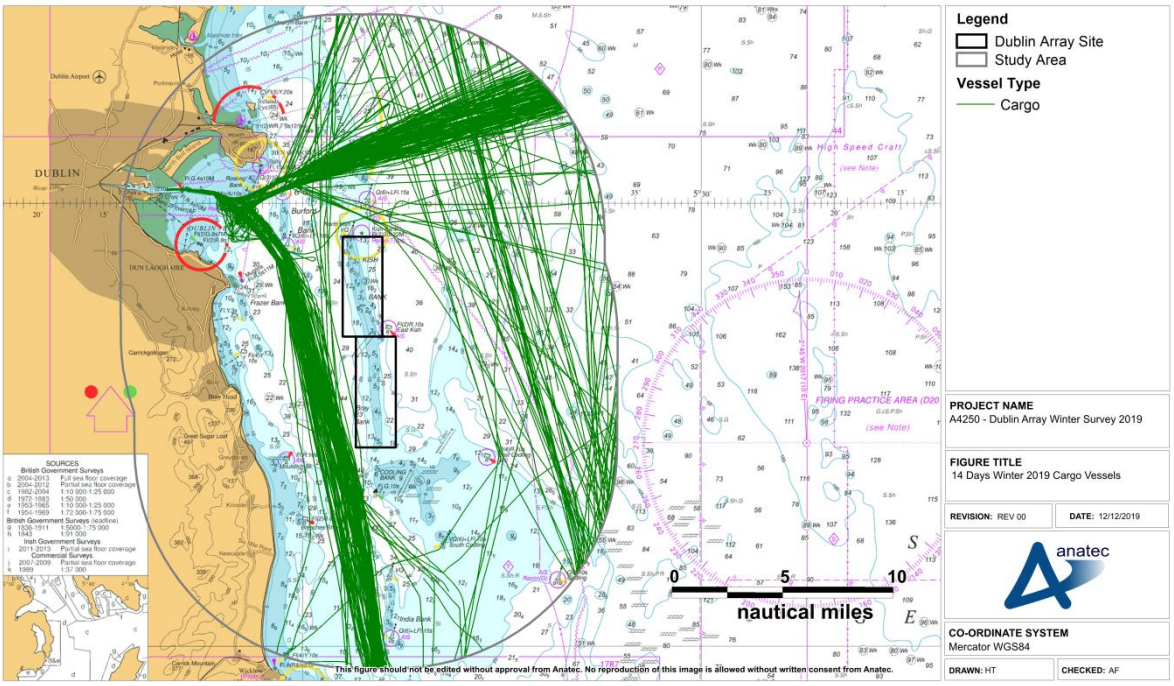


Figure 5.1 14 Days Winter 2019 - Cargo Vessels

One cargo vessel, *Luhnau,* intersected the Dublin Array OWF in the south western corner of the main development site boundary on 12th November 2019. The majority of cargo vessels were transiting between Dublin and Liverpool.

Approximately 19% of cargo vessels were northbound, 24% were eastbound, 31% were southbound and 26% were westbound.

Table 5-1 presents the details of the cargo vessels which were recorded within the study area most frequently.

Table 5-1 Details of Cargo Vessels Frequently Recorded within the Study Area

Name	Length (m)	Route	Operator	Number of Transits per Day
Seatruck Power	142	Dublin <> Liverpool	Seatruck ferries	2
Seatruck Pace	142	Dublin <> Heysham	Seatruck ferries	1-2
Seatruck Progress	142	Dublin <> Liverpool	Seatruck ferries	2
Seatruck Panorama	142	Dublin <> Liverpool	Seatruck ferries	1-2
Clipper Point	142	Dublin <> Liverpool	Seatruck ferries	1-2
Mistral	153	Dublin <> Liverpool	P&O Ferries	1-2

5.3 Tankers

Figure 5.2 presents tracks of tankers which were recorded within the study area. All of the 20 unique tankers recorded during the survey period were recorded on AIS.

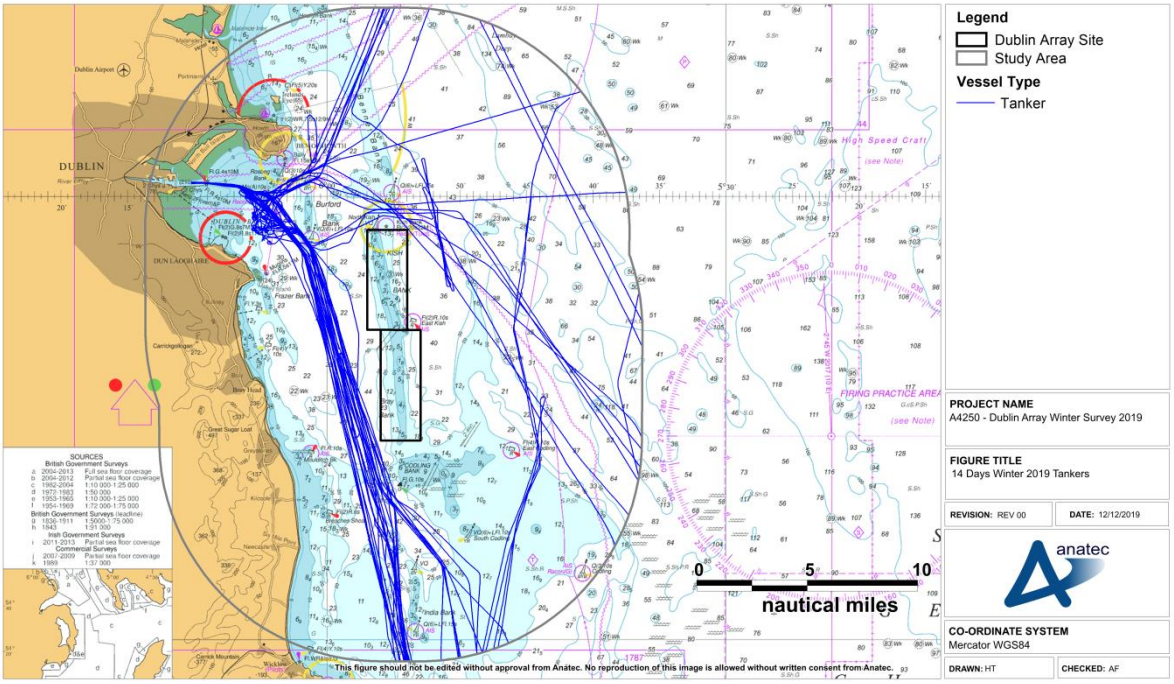


Figure 5.2 14 Days Winter 2019 Tankers

The closest tanker to the proposed Dublin Array OWF was the oil/chemical tanker *Atlantis Alvardo*, which was 0.1nm north east of the main development site boundary, travelling to Dublin on the 16th November 2019.

The majority of tankers recorded during the survey were headed southbound (45%) or northbound (25%) and recorded at the western extent of the study area whilst on passage between Dublin and ports such as Milford Haven, Pembroke and Stanlow.

5.4 Passenger and ROPAX Vessels

Figure 5.3 presents tracks of passenger and Roll-on/Roll-off Passenger (ROPAX) vessels which were recorded within the study area. The seven unique passenger vessels present during the survey were recorded on AIS.

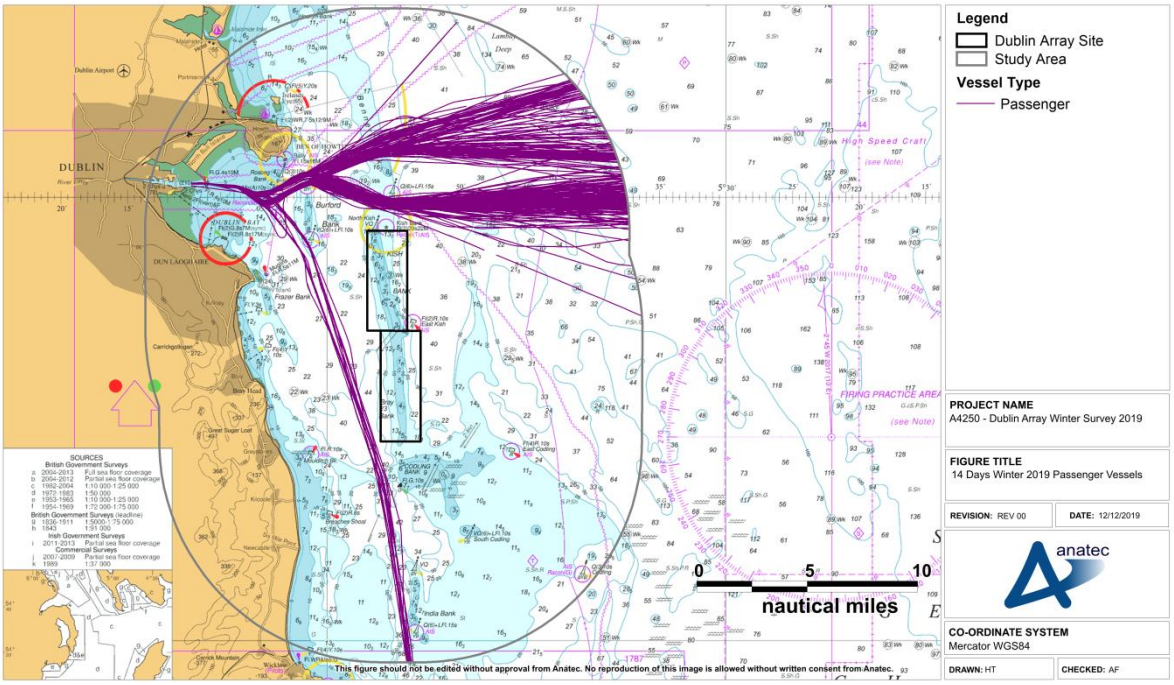


Figure 5.3 14 Days Winter 2019 Passenger Vessels

The majority of passenger vessels were eastbound/westbound between Dublin and ports such as Holyhead and Liverpool. Notable numbers of passenger vessels were also recorded travelling northbound/southbound between Dublin and Cherbourg.

Table 5-2 presents details of passenger and ROPAX vessels which were regularly recorded within the study area.

Table 5-2 Details of the Regular Passenger and ROPAX Vessels Transiting the Study Area

Name	Length (m)	Route/Destination	Operator	Number of Transits per Day
Stena Adventurer	211	Dublin <> Holyhead	Stena Line	4
Superfast X	203	Dublin <> Holyhead	Stena Line	4
W.B. Yeats	194	Dublin <> Cherbourg	Irish Ferries	4

Name	Length (m)	Route/Destination	Operator	Number of Transits per Day
Ulysses	204	Dublin <> Holyhead	Irish Ferries	4
Norbank	167	Dublin <> Liverpool	P&O Ferries	1-2
Norbay	167	Dublin <> Liverpool	P&O Ferries	2
Epsilon	186	Dublin <> Cherbourg	Irish ferries	1

The main passenger vessels recorded within the study area throughout the winter survey period were Stena Line's *Stena Adventurer* and *Superfast X* which operate on the Dublin to Holyhead route.

5.5 Fishing Vessels

Figure 5.4 presents tracks of fishing vessels that were recorded within the study area, colour-coded by activity (actively fishing or transiting through the area). A total of 44 unique fishing vessels were recorded during the survey period. Of these, 89% were recorded on AIS, while 11% were recorded on radar.

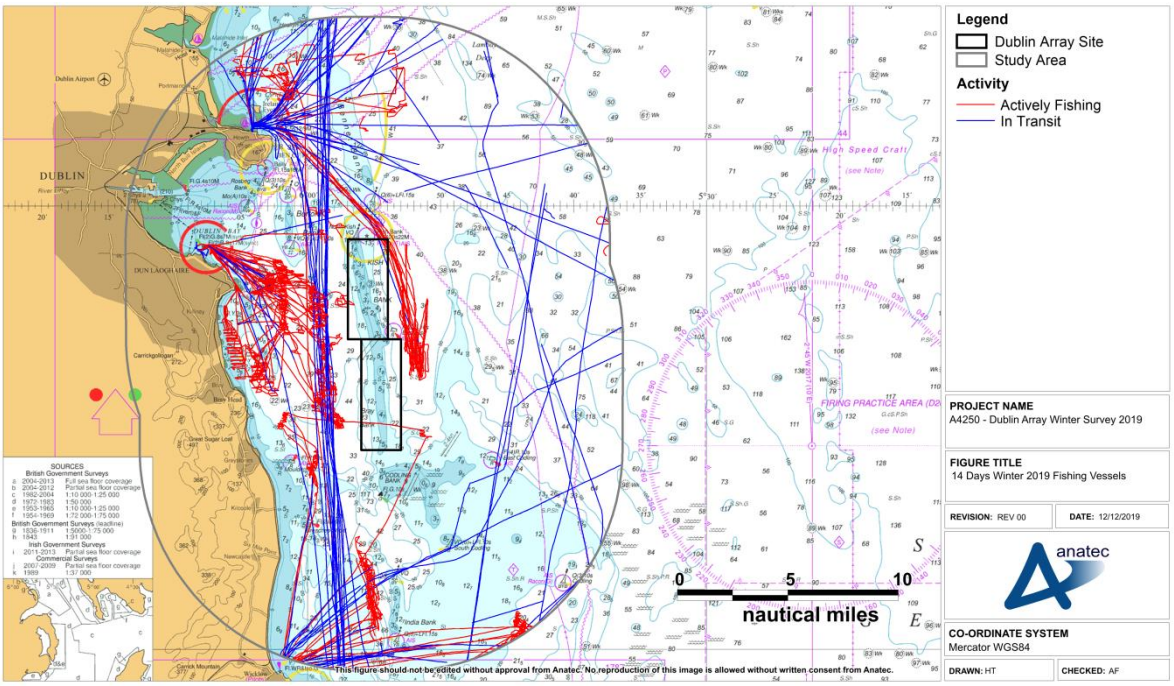


Figure 5.4 14 Days Winter 2019 Fishing Vessels

The *Orca* was the most active fishing vessel recorded throughout the survey. This vessel was recorded on AIS and operated close to shore, west of the Dublin Array main development site boundary. Approximately 7% of fishing vessels recorded intersected the site. All but two

of the tracks intersecting the site were recorded by radar. For this reason, only few gear types could be identified. Gear types that could be identified were dredges, trawls and pots and traps.

Table 5-3 presents details of the most frequently active fishing vessels within the study area and their gear type.

Table 5-3 Most Frequently Active Fishing Vessels

Name	PLN Number	Length (m)	Days Recorded	Port	Gear Type
Lily Tom 3	Unknown	16	12	Howth	Assumed Pots and Traps
Orca	WD312	9	6	Wexford	Set Gillnets
Silver Strand	D48P	12	5	Dublin	Pots and Traps

5.6 Recreational Vessels

Figure 5.5 presents tracks of recreational vessels recorded within the study area. A total of 47 unique recreational vessels were recorded during the survey period. Of these, 96% were recorded on AIS, while 4% were recorded on Radar.

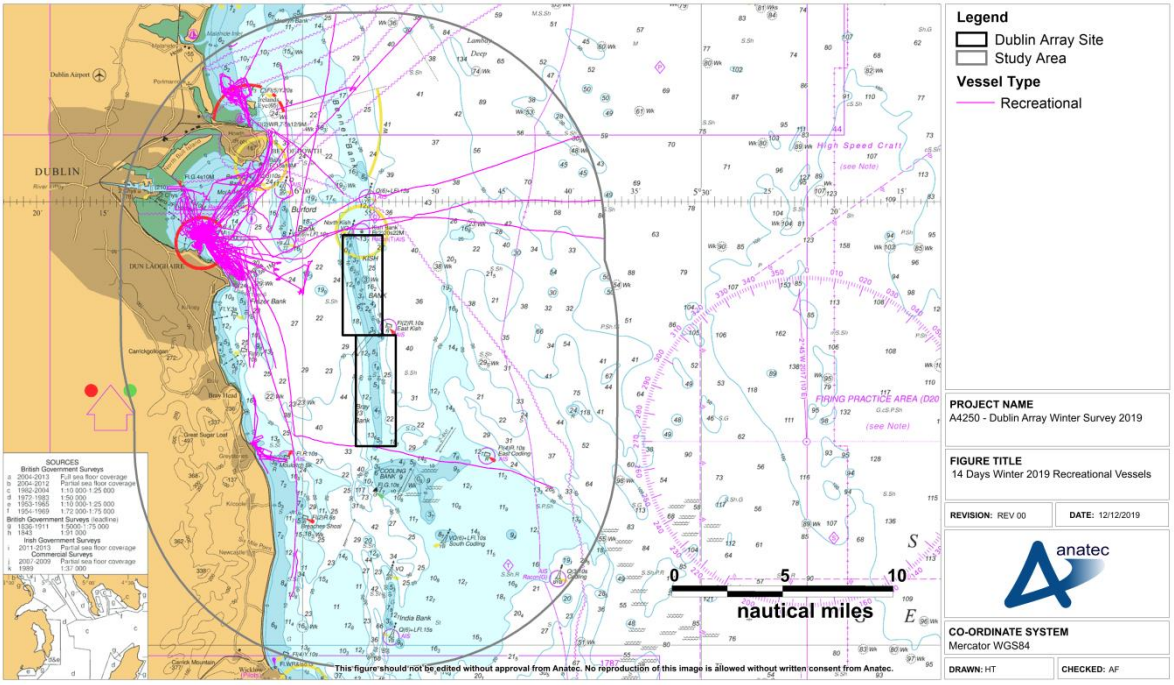


Figure 5.5 14 Days Winter 2019 Recreational Vessels

The majority of recreational activity was observed to be associated with Dun Laoghaire Marina and Howth Harbour. However it is noted that one recreational vessel was recorded approximately 10 metres into the south eastern corner of the Dublin Array OWF. No other recreational activity within the site was observed.

6 Summary

This report presents analysis of AIS and Radar data collected within a 10nm study area around the proposed Dublin Array OWF during a 14 day period in winter 2019. The survey was carried out from 8th November to 22nd November 2019.

On average 54 unique vessels per day were recorded within the study area throughout the survey (excluding the vessels removed from the analysis). The most common vessel types were cargo (35% of total traffic) and fishing vessels (21%).

The average length and draught of vessels was 91.2m and 5.6m respectively. The longest vessel recorded transiting through the study area was the 234m long cargo vessel *Celine*. The vessel with the deepest draught recorded was the tanker *Thun Lidkoping*, with a draught of 9.3m.

Throughout the survey period the majority of vessels were transiting in a westbound or southbound direction. The average speed of vessels transiting the study area was 9 knots. The fastest vessel recorded was the ROPAX vessel *Epsilon* travelling at 24.2 knots.

The most frequently broadcast destination was Dublin (28%). The most common cargo route was between Dublin and Liverpool, while passenger vessels mostly transited between Dublin and Holyhead.

There were on average 11 unique vessels recorded per day within 1nm of the proposed Dublin Array location, the majority of which were cargo vessels (49%). On average one vessel per day passed within the Dublin Array main development site boundary.