Arklow Bank Wind Park 2

Environmental Impact Assessment Report

Volume III, Appendix 13.2: Offshore Bat Survey 2022 Technical Report

sse Renewables

Statement of Authority

Name	Qualifications	Experience
Rob Rowlands PhD, B.Sc. (Hons.)	B.Sc. (Hons.) in Environmental Biology from the University of Wales. PhD, from the University College Dublin sponsored by Bord na Mona.	Dr Rob Rowlands is a Technical Director in RPS and currently leads the RPS Terrestrial Ecology Team. Rob is an experienced multi-disciplinary project manager and ecologist, full Member of the Chartered Institute of Ecology and Environmental Management (MCIEEM) and Chartered Environmentalist (CEnv). Following the completion of his PhD research into the restoration of cutaway peatlands for Bord na Mona in 2001, he has been sought to advise on the ecological requirements of multiple, complex projects both with respect to habitats and species. His ecological work has included the completion of Ecological Impact Assessments (including for Environmental Impact Assessments) and Appropriate Assessments/Natura Impact Statements with respect to the Habitats and Birds Directive. He is an experienced Expert Witness on terrestrial ecological matters.
Miles Newman PhD, MSc, BSc (Hons.)	BSc (Hons.) in Environmental Management from Dublin Institute of Technology MSc in Biodiversity and Conservation from Trinity College Dublin PGDip in Statistics from Trinity College Dublin PhD in Botany from Trinity College Dublin	Dr Miles Newman is an Associate Ecologist in RPS with professional experience working in the private sector, research, lecturing and Non-Governmental Organizations (NGOs). He holds a PhD in Botany, Postgraduate Diploma in Statistics, MSc in Biodiversity and Conservation and a BSc (Hons) in Environmental Management. He is a Chartered Environmentalist and a Member of the Chartered Institute of Ecology and Environmental Management (MCIEEM). Miles is an experienced project lead and manager. He provides key ecological inputs including site selection, ecological surveying and coordination, Ecological Impact Assessments (EcIA), mitigation strategy development, Ecological Clerk of Works, long-term site management plans, and operational stage surveying and reporting. He has a wide range of planning reports and scientific peer-review publications.

ARKLOW BANK WIND PARK

Offshore Bat Survey 2022 Technical Report

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RPS

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1 INTRODUCTION

RPS Group Limited (RPS) was commissioned by Sure Partners Limited to produce this report to inform ecological baseline in relation to bats in the offshore environment.

The 2022 survey effort represents the second consecutive year of monitoring for bat activity in the vicinity of the offshore monopile. As with the 2021 survey the same methodology for set up and deployment of the equipment was used for the purposes of continuity. For completeness the equipment, deployment and maintenance methodology is included below.

1.1 Objectives

In order to address to the lack of empirical evidence in the Irish context, the objectives of the survey are to:

- Identify any offshore bat activity in the vicinity of the monopile structure located approximately 8 km offshore and to the east of Arklow within the Irish Sea (Position:52.88544136, -005.923436330) (**Figure 1.1**); and
- Identify whether there is any seasonality in the survey data which may indicate evidence of migration and/or offshore foraging/commuting activity within the vicinity of the monopile structure.

N

Greystones

Wicklow

Rathdrum

M11

Arklow

Leinster

Éire / Ireland

Distance from coast: 8 km

0 87.5175 350 525

Kilometers

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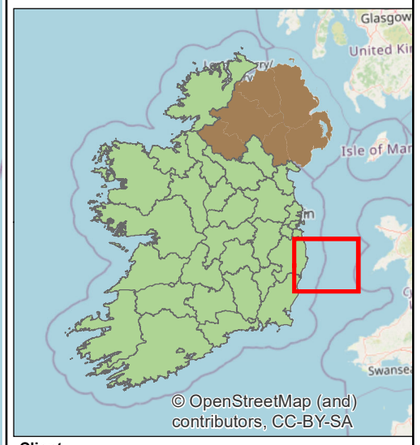
Legend

- Monopile Structure



Client

Sure Partners Limited

Project

Arklow Bank Wind Park

Title

Figure 1.1 Location and Figure of Offshore Monopile

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Issue Details

Drawn By: MG	**Project No.** MDR1691A
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Date: 08/02/2023	

NOTE:
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2 METHODOLOGIES

2.1 Equipment

The materials used for the deployment of the bat detectors during the survey were as follows:

- 2x Song Meter SM4BAT FS Bat Detectors;
- 2x SMM-U2 Ultrasonic Microphones;
- 2x 5 m microphone cables;
- 4x 64 Gb SD cards;
- Batteries (size D) as required;
- 2x IP67 armoured weatherproof case(s);
- 2x Waterproof cable gland 24 mm;
- Insulating tape;
- Waterproof tape;
- Tec-7 silicone gel sealant;
- Silicone spray;
- Ratchet straps;
- Padlocks; and
- Cable ties.

Pre-deployment, the IP67 weatherproof cases were fitted with 24 mm waterproof cable glands and further secured with silicone gel sealant. The equipment was prepared by an experienced RPS ecologist (the preparation of the boxes and detectors can be viewed in **Appendix A**). This was to ensure that no water ingress was possible. Each of the Song Meter SM4BAT FS Bat Detectors were fitted with new microphones and then programmed as per the methodology outlined in **Appendix B**, in preparation for the 2022 deployment.

2.2 Deployment Method

The equipment was deployed on the 4th of March 2022 to monitor the bat activity in the vicinity of the monopile offshore from Arklow. The setup before issuing to a marine contractor, Alpha Marine for deployment can be seen in **Figure 2.1**. Alpha Marine completed the installation of the equipment on the monopile during daylight hours and under the remote supervision of the experienced ecologist. They were briefed on the following:

- The equipment and its operation (including sensitivities relating to batteries, memory cards, etc); and
- The deployment of the equipment.

The detectors and their associated armoured cases were secured to the top platform of the monopile using ratchet straps. The two microphones were secured on the safety railing of the platform using cable ties, pointing out in a northerly and southerly direction. The cable lead of the microphone was also cable-tied to the structure secure it in place (**Figure 2.2**, and **Figure 2.3**).

Figure 2.1 Equipment as deployed

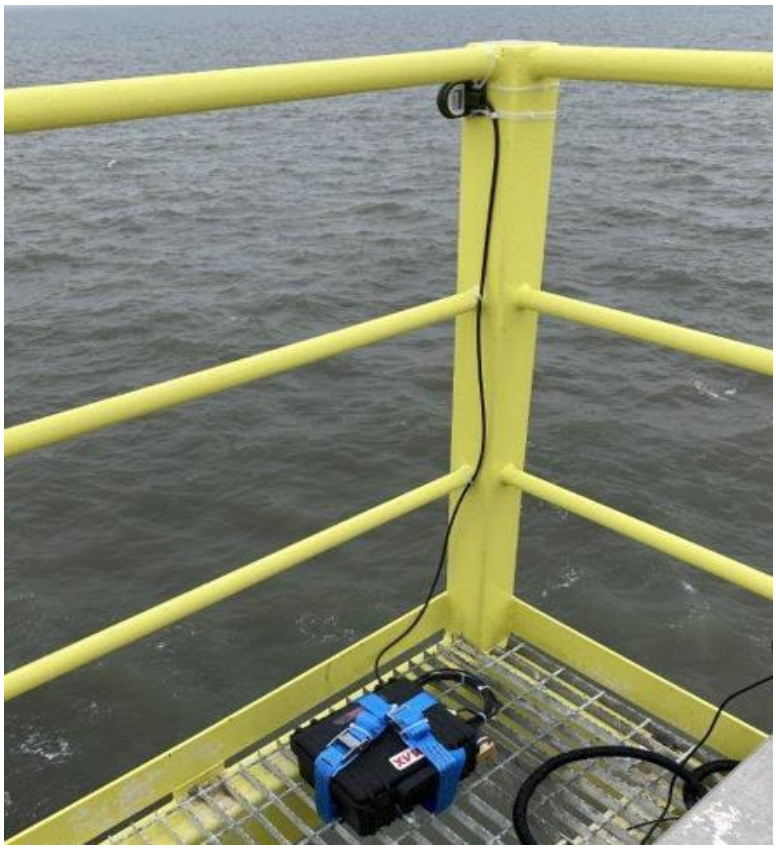

Figure 2.2 Placement of the north facing bat detector on the platform (in 2021)

Figure 2.3 Placement of the south facing bat detector on the platform (in 2021)

2.3 Maintenance

Maintenance visits were carried out periodically by Alpha Marine to replace the batteries and SD cards in each of the detectors. This enabled RPS to check the functioning of the equipment, and to assess the recorded data during the monitoring period (March-October). The Alpha Marine team were trained by experienced RPS ecologists on ongoing maintenance and management of the equipment. During each maintenance visit, Alpha Marine checked:

- Battery status;
- SD cards status; and
- Recording schedule.

The detailed protocols for replacing the internal batteries and SD cards are outlined in **Appendix B.** This is a step-by-step process, to ensure that the maintenance of the equipment was correct and consistent throughout the monitoring period.

2.4 Data Analysis

After each maintenance visit, SD cards containing the bat recorded data were transferred from Alpha Marine to RPS. The recorded data was analysed using Kaleidoscope (Wildlife Acoustics, Inc.) sound analysis software. Following the analysis of all audio recordings, 10% of all noise files were manually checked for bat activity, this follows professional judgement protocols used for onshore wind energy projects. All bat calls, calls with no auto-identification or with multiple bats within the same call, were checked manually to confirm identification. During manual analysis, calls were assigned to species according to their key parameters. Determinations of species identification and activity were made by suitable qualified and experienced RPS ecologists.

2.5 Limitations

2.5.1 Survey methods

In relation to survey methods, there are limitations or considerations in relation to the interpretation of the data:

- There are no standardised survey methods or guidelines in Ireland or internationally for characterising offshore bat activity which can be implemented; however; existing UNEP/EUROBAT guidelines (Rodrigues *et al*., 2015; Kyheröinen *et al*., 2019), recommend surveying offshore wind turbines in the same manner as land-based projects (e.g., Colins *et al*., 2016; Marnell *et al*., 2022);
- Alongside the limited published guidelines, surveying for bats offshore can be challenging due to the potentially harsh environment and the impact this could potentially have on the equipment. It can be expected that there is likely to be some level of equipment failure which can, in part, be mitigated through building in some level of equipment "contingency" into the survey design through regular maintenance/data collection visits to ensure that the equipment is working effectively. Such measures have been "built in" to the survey methodology as far as possible to limit these risks; and
- The microphones used have a typical detection range of between 15 m to 30 m. This could be a limitation if some species fly higher than can be detected by the microphones.

2.5.2 Data capture

There are challenges associated with the use of survey equipment in the marine environment. The rapid changes in weather or harsh conditions which occur offshore may lead to the malfunction of instruments. Due to adverse weather conditions, scheduled maintenance visits were in some instances delayed as it was not safe to access the platform which resulted in loss of data from both of the detectors due to periodic equipment malfunction (i.e., battery power loss).

3 RESULTS

3.1 Data Capture

The date of operation for both of the detectors was from 3rd of March 2022 to 19th of October 2022. There were five maintenance visits throughout the monitoring period. The Alpha Marine team followed the guidelines and protocols from RPS for maintaining and deploying the equipment. The dates of the maintenance visits can be seen below in **Table 3.1**. It can also be noted that the equipment malfunction was discovered for the south facing detector after the third and fifth maintenance visits. Therefore, there was a loss of data between the 24th of May and 4th of July 2022, and again between the 15th of August to the 23rd of September 2022 for the south facing detector. During this period the north facing detector remained functional (**Table 3.1**). No water egress into the waterproof boxes was noted during the maintenance visits. The equipment was returned to RPS after the monitoring period had finished (see **Figure 3.1**).

Table 3.1 Visits during Monitoring Period.

Visit Type	Date	Data Capture (Nights recorded)	
		North Facing Detector	South Facing Detector
Deployment	04/03/2022	-	-
Maintenance	15/04/2022	5	7
Maintenance	24/05/2022	20	20
Maintenance	04/07/2022	41	0
Maintenance	15/08/2022	42	42
Maintenance	23/09/2022	11	0
Collection	19/10/2022	27	24

Figure 3.1 Equipment in returned state. The weatherproof cases were heavily fouled by bird guano.

3.2 Bat Recordings

3.2.1.1 Bats recorded during the survey period

Bat activity was recorded during the survey. The results from the survey can be seen in **Table 3.2** below. The detectors recorded two bat species; Leisler's (*Nyctalus leisleri)* and common pipistrelle (*Pipistrellus pipistrellus).* Commuting and feeding behaviours were noted from the data collected.

Table 3.2 Bat recordings detected in the vicinity of the monopile during the monitoring period (March - October 2022).

Detector	Date	Time	Species	Behaviour
North	06/08/2022	23:31:51	Leisler's (*Nyctalus leisleri)*	Echolocation – a short section similar to a feeding buzz but not conclusively identified as one.
South	15/08/2022	00:29:42	Leisler's (*Nyctalus leisleri))*	Echolocation/commuting
North	01/10/2022	21:40:56	Common pipistrelle (*Pipistrellus pipistrellus)*	Echolocation/commuting
South	02/10/2022	21:42:42	Common pipistrelle (*Pipistrellus pipistrellus*)	Echolocation/commuting
South	02/10/2022	21:42:59	Common pipistrelle (*Pipistrellus pipistrellus*)	Echolocation/commuting

3.2.1.2 Weather conditions during survey period

For the purposes of analysis site specific data for the deployment period at an average height of 100 m was analysed. For the purposes of completeness (where sections of data such as barometric pressure, were incomplete) historical weather data was obtained from the website Visual Crossing[1], which provided hourly and 24-hour average data from the four closest weather stations to the site. The weather stations utilised for the historical data sets are detailed below in **Table 3.3**.

Table 3.3 Weather Stations in the vicinity of the project used for historical data

Station	ID	Distance (Km)	Latitude	Longitude
EW7034 Roundwood IE	E7034	30	53.053	-6.275
FW8809 Howth IE	F8809	54	53.365	-6.072
EIME	EIME	57	53.3	-6.43
EIDW	EIDW	64	53.43	-6.25
AMOUK50 (maritime)	AMOUK50	68	52.2000	-6.3000
Johnstown Castle, EI	03956099999	77	52.283	-6.483

[1] Available online at: https://www.visualcrossing.com/weather/weather-data-services. Accessed 4/2/2023.

For the duration of the survey period where the detectors were deployed the wind direction was predominantly in a south-south-east to west-south-west direction with an average wind speed of 22.4 kts with the gusts frequently exceeding 40 kts (**Figure 3.2**).

The weather conditions in the seven days prior to the first detection were quite variable with temperatures ranging from 17.0-13.7°C, windspeeds at a Beaufort force (F) 1-F3 (1-9 kts), and wind direction veering from a south westerly to a northly direction before backing again to a west-south-west. During this period there was a low-pressure dip in the days preceding the first bat call (**Figure 3.3**). The night of first detection (6th of August), occurred during a high-pressure, with no rain, a steady west-south-westerly breeze F2-3 (-9 kts), and full cloud coverage. A further single Leisler's call was recorded (16th of August) in similar conditions, with lighter winds (F3-4, 10-17 kts), though the prevailing wind had veered to a north-north-westerly direction (**Figure 3.4**).

During the surveys the majority of bat detections were within a fresh to strong breeze F4-F6 (5.6 - 15.15 m/s) windspeed and an average temperature of 12.06 °C (**Appendix C**).

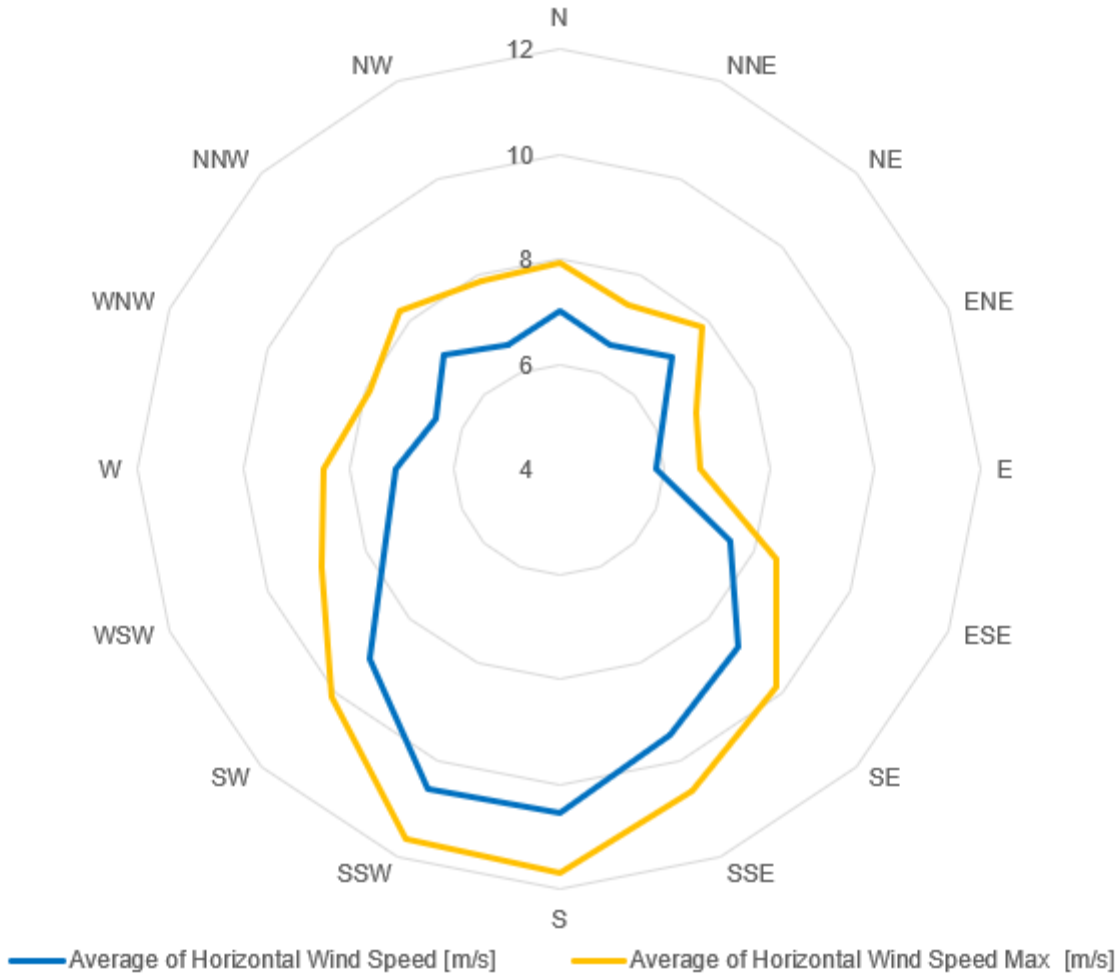

Figure 3.2 Prevailing wind directions for the duration of the survey at the monopile location

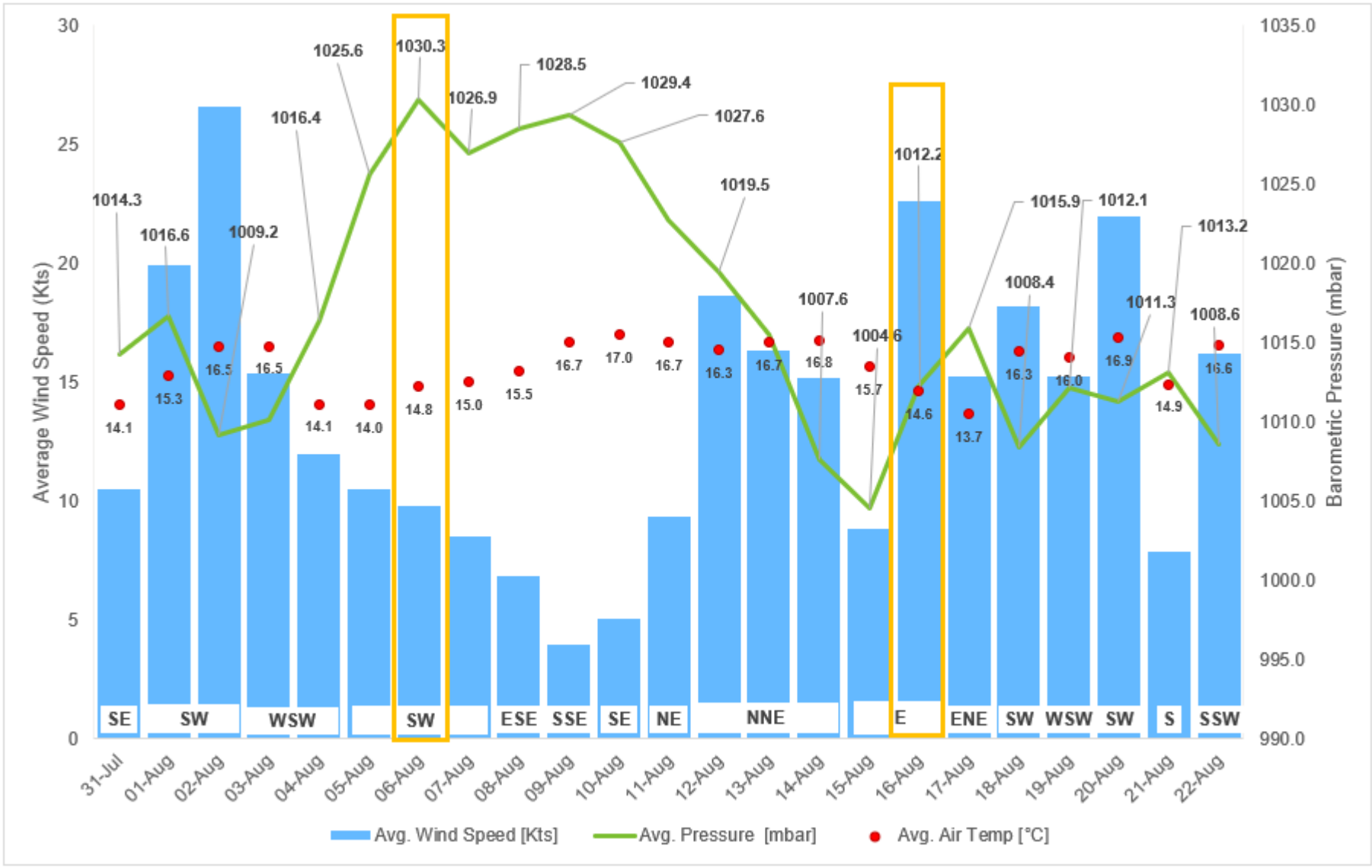

Figure 3.3 Weather data in the 7 days prior and post the first and last dates of detection of bats on site during August 2022 (Date of bat activity outlined in orange)

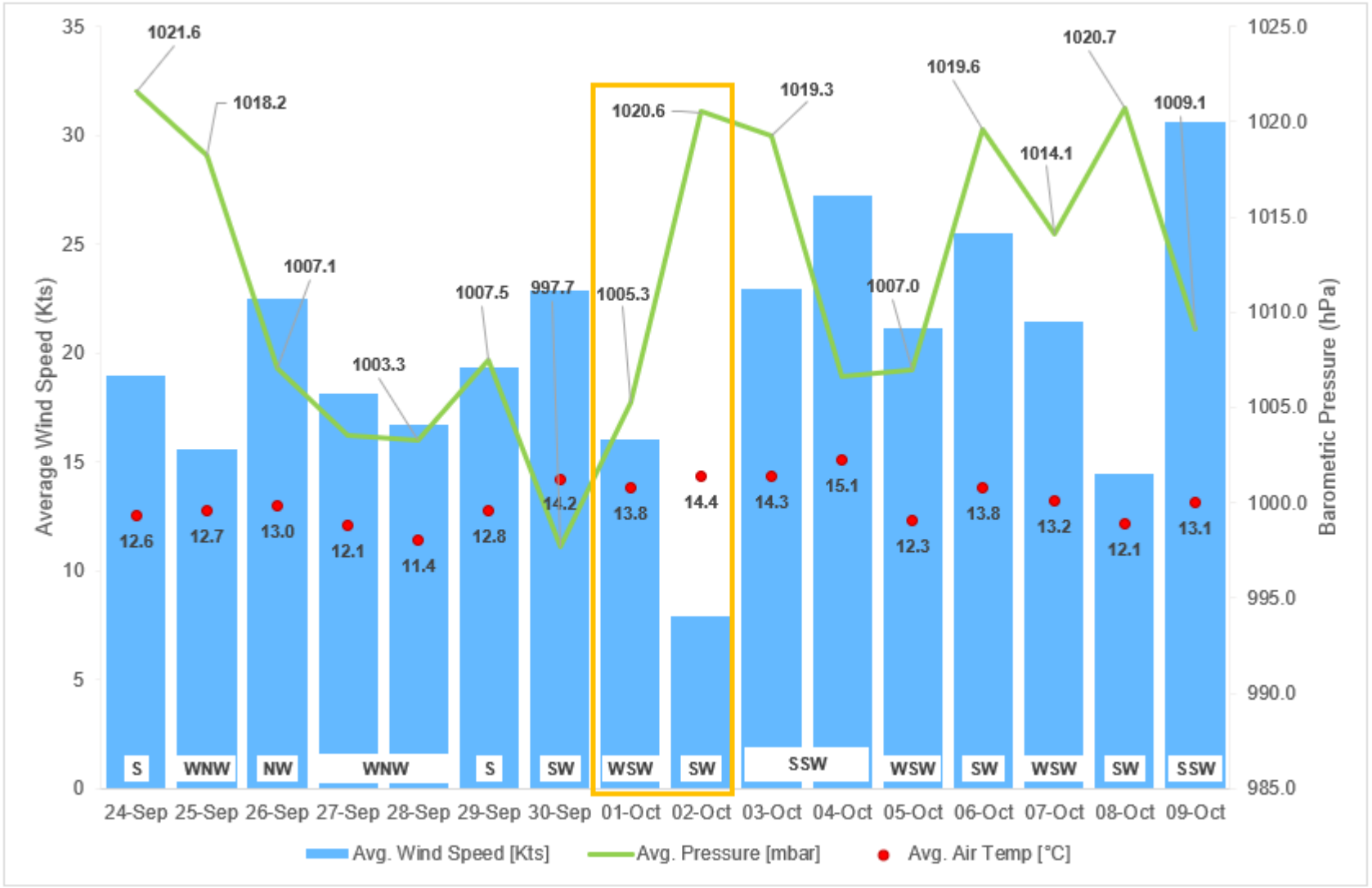

Figure 3.4 Weather data in the 7 days prior and post the first and last dates of detection of bats on site during October (Date of bat activity outlined in orange)

3.3 Comparison 2021-2022

In 2021, during the seven-month deployment both Leisler's and common pipistrelle bats were recorded during July to August on two separate nights. During the 2022 deployment both of these species of bat were recorded on four separate nights in the months of August and October. (**Table 3.4**).

Table 3.4: Comparison of 2021 and 2022 bat detection records

Year	Date Bats Encountered	North Detector (Species)	South Detector (Species)	Behaviour
2021 (May- November)	18/07/2021	Leisler's		Commuting
	18/08/2021		Leisler's	Feeding
	18/08/2021		Leisler's	Feeding
	18/08/2021		Common pipistrelle	Feeding
2022 (March - October)	06/08/2022	Leisler's		Echolocation – a short section similar to a feeding buzz but not conclusively identified
	15/08/2022		Leisler's	Commuting
	01/10/2022	Common pipistrelle		Commuting
	02/10/2022		Common pipistrelle	Commuting
	02/10/2022		Common pipistrelle	Commuting

4 CONCLUSION

The findings of the survey confirm the presence of two bat species (Leisler's bats and common pipistrelle) in the offshore environment and within the vicinity of the monopile in both 2021 and 2022. Bat commuting and potential bat feeding behaviours were identified in 2022. Commuting common pipistrelle records from October 2022 occurred within the likely autumn migration window. Although migration cannot be confirmed for these records due to the unknown flight paths of the individuals, it is possible that migration occurred. Further offshore bat surveys are recommended to add to the available empirical data and such surveys are likely to indicate the periods in which bats are most likely to be present, potential migration timing, and weather condition preferences.

5 REFERENCES

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Rodrigues, L., Bach, M.J., Dubourg-Savage, B., Karapandza, D., Kovac, T., Kervyn, J., Dekker, A., Kepal, P., Bach, J., Collins, C., Harbusch, K., Park, B., Micevski, J., Minderman (2015) Guidelines for consideration of bats in wind farm projects, UNEP-Eurobats, publication No 6. Revision 2014. UNEP/EUROBATS Secretariat: Bonn, Germany.

Appendix A
Preparation Method

Appendix B
Maintenance Protocol

Appendix C
Weather Conditions

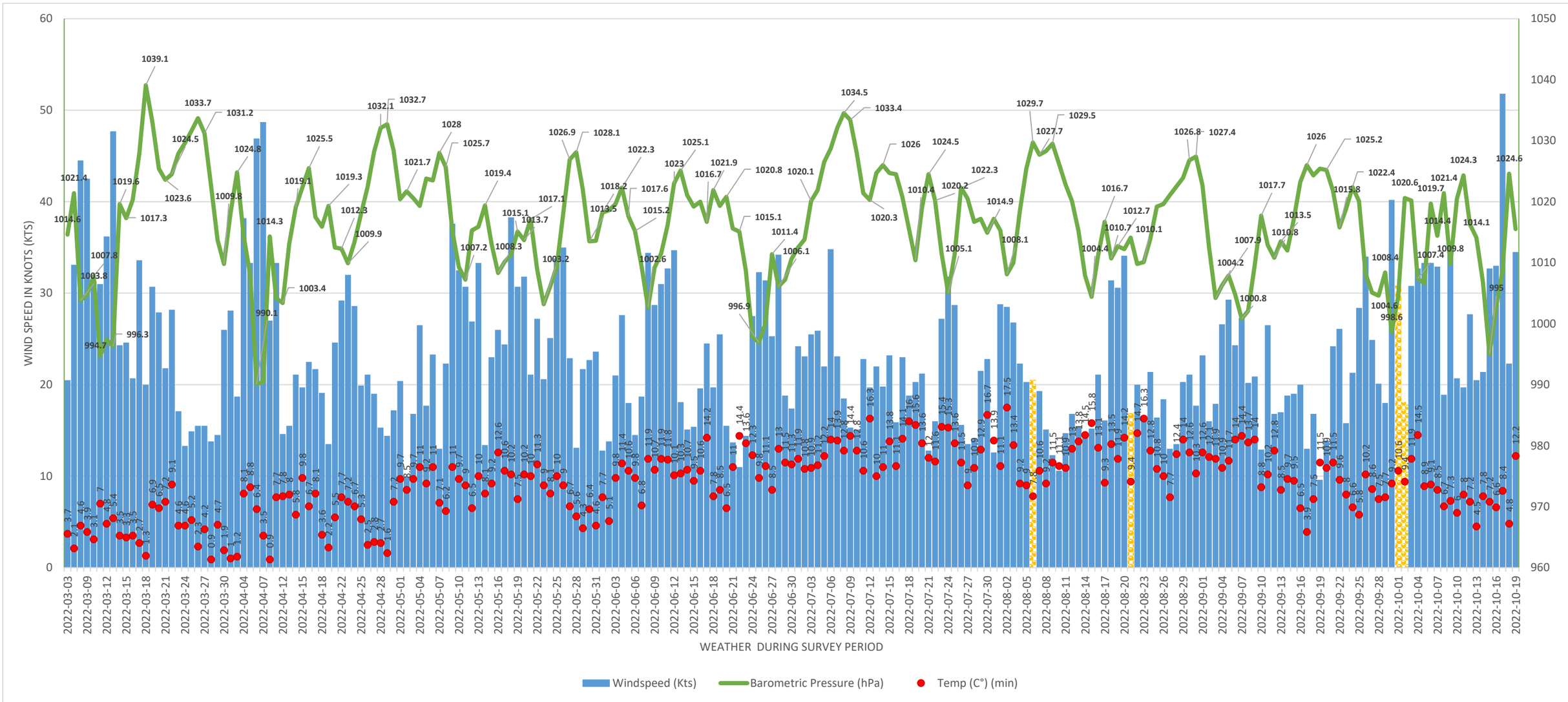

Figure C 1 Weather pattern for the deployment of the detectors during the survey period. Yellow pattern denotes dates where bat activity was recorded in the vicinity of the monopile (data from visual crossing).

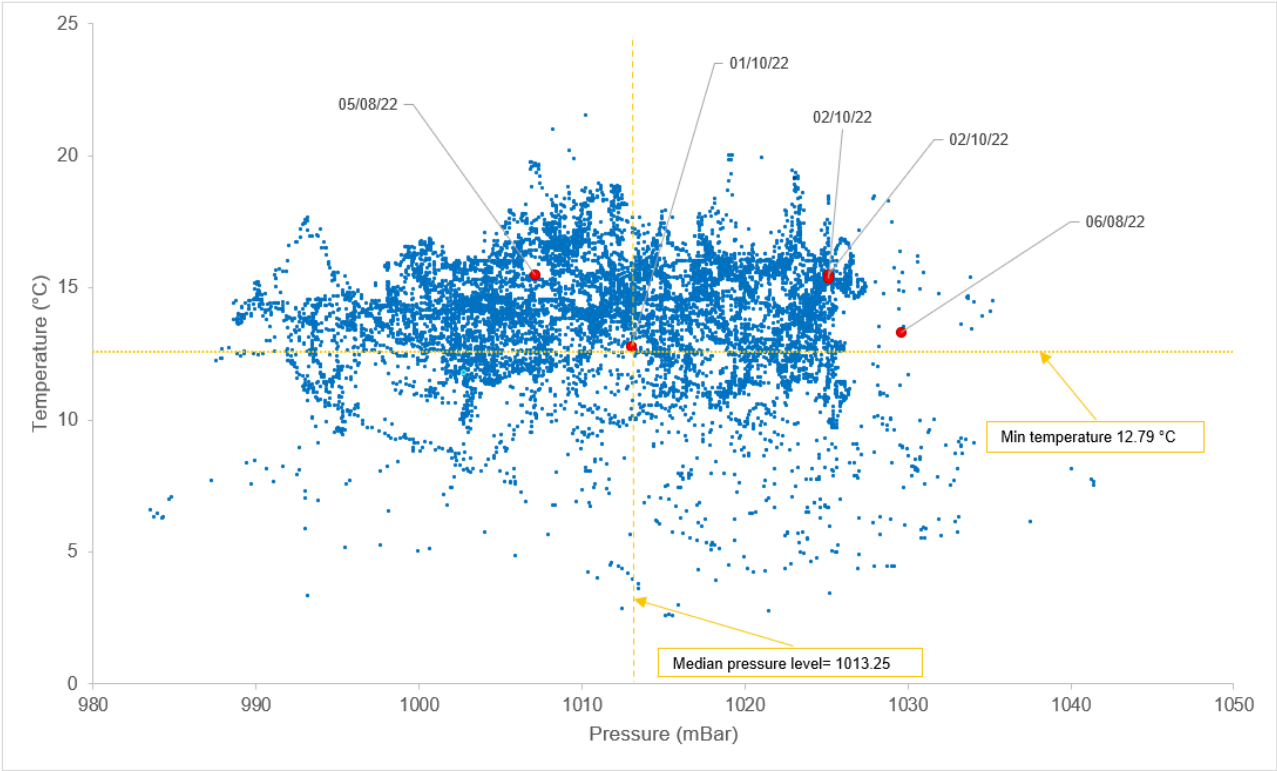

Figure C 2 Correlation between temperature and pressure and the occurrence of bats (red dots) in the offshore during the entire survey period (site specific weather data).

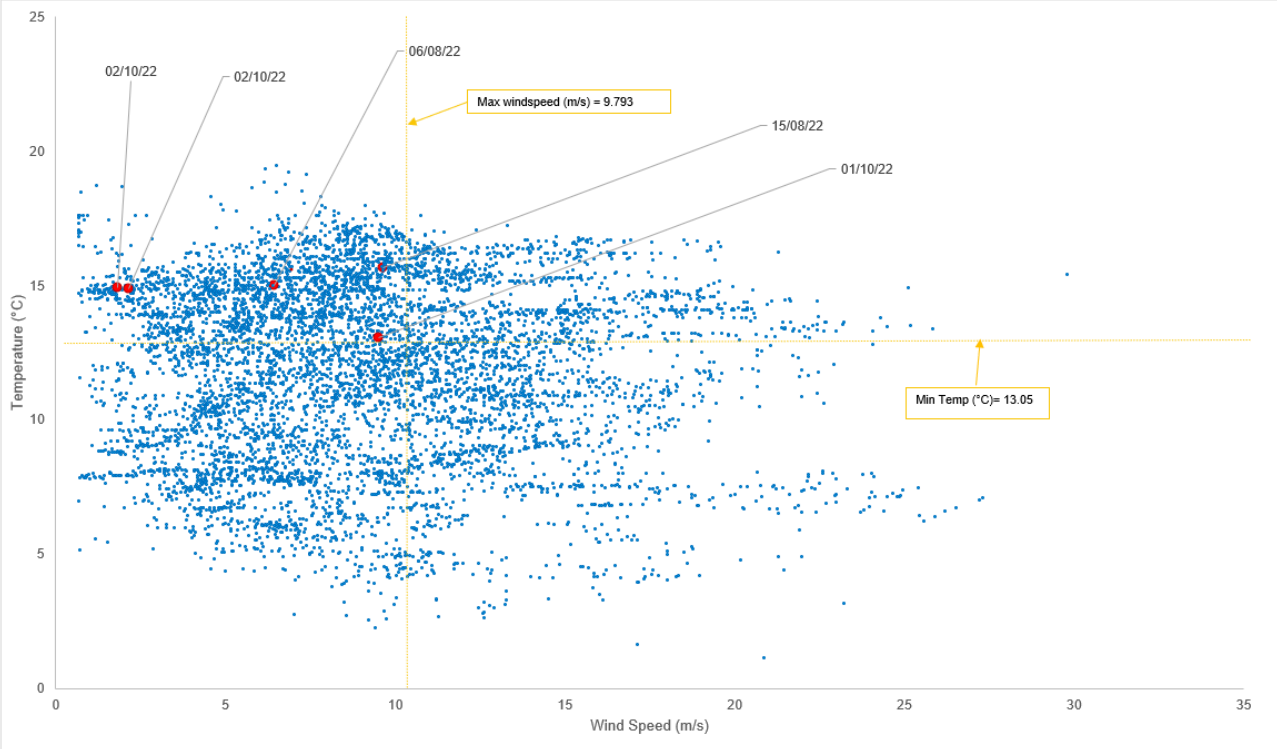

Figure C 3 Correlation between temperature and wind speed in m/s and the occurrence of bats (red dots) in the offshore during the entire survey period (site specific weather data).