Eigg Mountain Wind Project, Nova Scotia

Radar and Acoustic Monitoring - 2025 - Final Report

Tabanid Consulting Ltd.

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Contents

Prepared for:
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1 Introduction

CBCL retained Tabanid Consulting Ltd (TCL) to lead the radar and acoustic monitoring program for nocturnal migrating birds (spring and fall 2025) at a proposed windfarm near Eigg Mountain, Antigonish County, Nova Scotia, about 10 km NW of the town of Antigonish.

Here we provide a detailed account of the monitoring undertaken at the site in the spring and fall of 2025, an analysis of the patterns of movement of birds during that period and how they relate to weather conditions, and a summary of the key findings that are relevant to assessing the potential impact of the wind power project on migratory birds.

1.1 Project Details

Precise project details (e.g. turbine layout) are available in the Environmental Assessment Registration Document.

2 Methods

2.1 Radar Monitoring

The radar location was selected to provide clear views of the overhead sky (which allows the radar to properly sample the avifauna moving through the site during migration) and site security. A location (lat 45.71393, lon -62.11135) near the north-east side of the Project Area was chosen. The location was close to a service road for simple access, and behind a group of trees, which provided some security (see Figure 1). The same site was used for monitoring in both the spring and fall seasons.

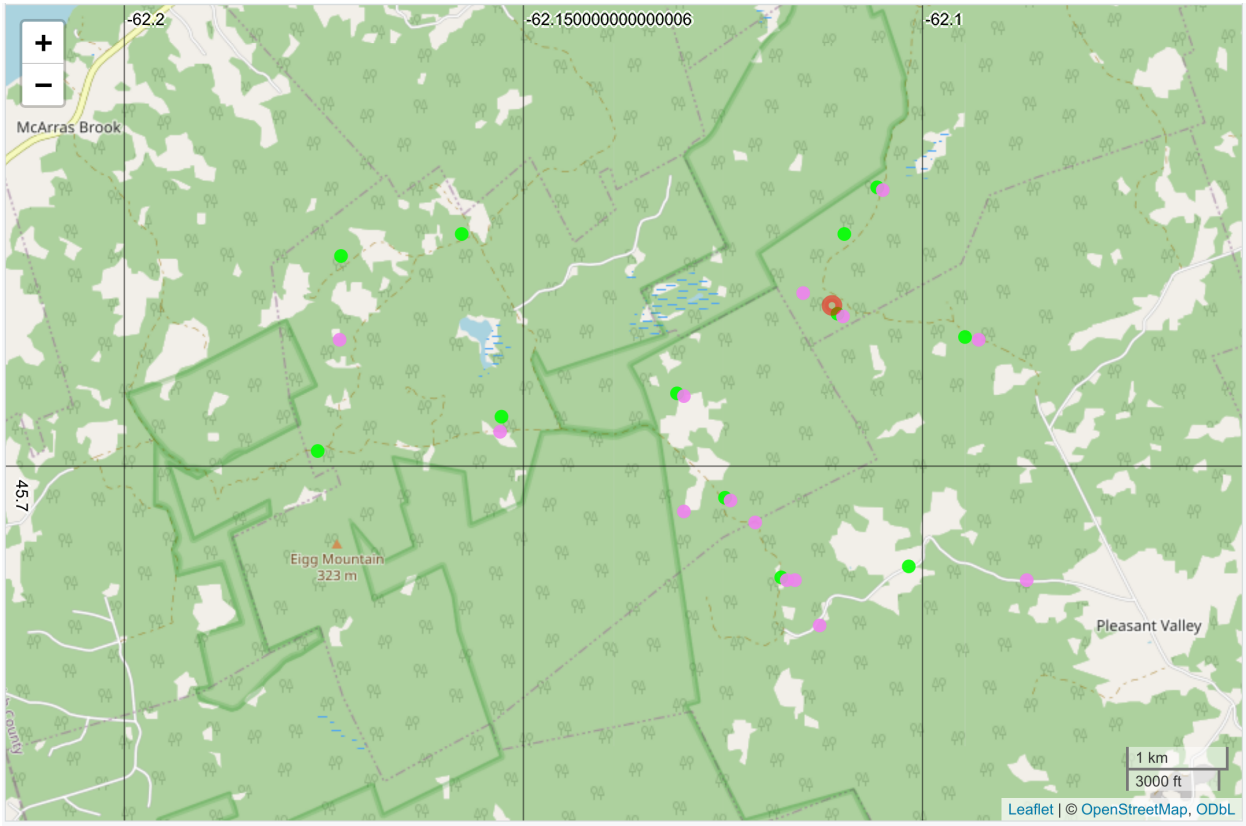

Figure 1: Project Area in Antigonish County, NS, Canada. the red circle is the radar location. Violet (spring) and Green (fall) circles are locations of the ARUs. Not all ARUs were operation for the duration of the monitoring.

The radar used was a Furuno DRS25A magnetron radar (25 kW; X-band - 9410 MHz) with a 1.8 m open-array antenna (beam width of approximately 22 degrees in the horizontal plane and 1.35 degrees in the vertical plane). The radar was mounted vertically on a custom support framework so as to obtain better information on the altitude of targets. The unit was oriented such that the beam sampled from a N-S direction from the radar, to align with the expected movement of targets. The radar was run in short pulse mode (2100 pulses per second) at 24 revolutions per minute (rpm).

The radar signal was digitized at 4.5 m range resolution with an azimuth resolution of 1.35 degrees using custom software developed by TCL (program `radarcam`). Raw data were saved on external hard drives in the field, and partially processed data were uploaded hourly to a remote server for safe storage. They were analyzed post-hoc using the open-source software, `radR` (Taylor et al. 2010).

In spring 2025, the radar was operated between the evening of 24 March and the morning of 9 June and functioned properly for all nights.

In fall 2025, the radar was operated between the evening of 15 July and the morning of 22 November. From mid-August until the end of August, there was an extreme risk of fire throughout Nova Scotia, and the provincial government closed access to the woods for all but essential activities. The solar power supply posed a very small risk of fire, so with an abundance of caution, we shut down the radar from 17-31 August. Acoustic units continued to operate during that time. In addition, for a short period between 19 and 21 September no radar data were collected due to an overlooked data storage issue. Finally, from 15-18 November, the radar did not function due to power issues (a week-long period of rain and cloud cover prevented sufficient solar input to keep the unit running).

2.1.1 Radar Data Processing

Radar data were processed using the `radR` software (Taylor et al. 2010). Blips (putative targets) were extracted from the raw radar signal (movies) if their 'hot score threshold' (a `radR` parameter that indicates how different a portion of the observed signal changes with time) exceeded 2.5, across an area of 6 samples (4.5 m range bins - the 'radial span') and 6 pulses (individual pulses of the beam as it sweeps through its rotation - the 'angular span'). Putative targets were then further filtered so that only targets greater than 30 samples in size, with a minimum 'area' of 30 and maximum 'area' of 5000 were retained. The minimum and maximum 'angular span' was set at 24 and 70 respectively and the minimum 'radial span' was set at 6. These parameters were chosen visually by examining movies through the seasons, and adjusting them so that most retained targets appeared to be moving targets (e.g. birds, bats and insects). These are typical of such parameters at most sites, except that here we increased the lower threshold for angular span, to aid in removing more insects.

The settings allowed for weak targets at long range to be identified over background noise, but also detect insects at short range and birds at the edge of the radar beam. Data from the site were free of most ground clutter and multi-path reflection, providing a solid data set for analysis.

Putative bird targets were extracted from the data by filtering on the peak power of the radar return for each target and corrected that for range (since returned power decreases with range to the fourth power). The value of "scaled intensity" (max-min scaled between 0 and 1) was set at 0.65. These values were compared across nights and in association with acoustic data to determine a threshold above which we were confident that most targets retained were likely birds and we were removing most insects. Such distinctions are difficult to make since there is considerable overlap in these values between the two target groups (e.g. see Wang et al. 2025., Fig 8).

Rain obscures bird targets, but many birds still fly on nights with rain, and can readily be detected by the radar during rainy nights when there are periods with no rain. Therefore, each night of radar data was visually inspected to determine where periods of rain began and ended. The start and end of each period was marked, and these periods were excluded from all plots and analysis.

To simplify presentation and analysis, and to partially remove bias associated with distance and orientation of targets with respect to the radar beam, we extracted from the full data set only those targets that were found a "column" of space starting at a distance along the ground. For the present site, we set the limits of this column to between 700 and 900 m from the radar (to the N) beginning 80 m above ground level (agl) to 1000 m agl. The approach allows for sampling low altitudes horizontally from the radar, and also partially excludes 'counting' targets that are detected across multiple sweeps of the beam.

2.1.2 Radar Analysis

The primary objective of the radar study was to visualize the general patterns of migrating birds at the Project Area and statistically assess how the total number of targets detected relates to weather variables that are typically correlated with migratory movement (e.g. wind speed and direction, relative humidity). Further, we were interested in whether these patterns differed for targets detected at low (< 200 m agl but above 80 m agl) and higher (> 200 m and < 1000 m agl) altitudes as a proxy for possible effects of wind turbines on movement.

We derived two response variables from the processed radar data. The first was the number of targets detected in each hourly period across all nights (within the column of air described above). The second was the ratio of the number of targets detected at lower altituded (between 80 and 200 m agl) and higher altitudes (between 200 and 1000 m agl). That ratio is very likely positively related to the proportion of targets actually flying beneath 200 m but does not represent the actual proportion, since the probability of detecting targets decreases with increasing altitude due to changes in the shape and size of the radar beam, as well as the size of the targets. As such, this ratio overestimates the proportion of targets observed at lower altitudes to some unknown extent. Regardless, the ratio serves as a useful indicator to determine under which conditions and times more targets are flying at relatively lower altitudes.

Weather data (wind speed and direction, temperature, and relative humidity) were downloaded from the Copernicus Climate Data Store - ERA5 hourly data on pressure levels from 1940 to present (https://cds.climate.copernicus.eu; Hersbach et al. 2023). For this report, wind data from a pressure level of 975 hPa were used (equating to about 200-400 m agl).

The effect of weather (tailwind assistance, temperature and humidity) on the log of the number of targets detected and the proportion of targets between 80 and 200 m agl was modeled using generalized linear models. Simple models were fit to show the dominant relationships between the two response variables described above and the weather variables. In addition, a 'tailwind assistance' variable was used to provide a measure of how much the wind would assist a given bird flying in a specific direction. It is known that nocturnal migrants fly with positive tailwind assistance (Peckford and Taylor 2008, Shamoun-Baranes et al. 2017). Tailwind assistance is a function of the direction of the wind and its speed, relative to the direction of movement of the target. Tailwind assistance was calculated assuming migrants are flying in a direction of 225 degrees in the fall and 45 degrees in the spring. For example, if the wind was flowing from the direction of 225 degrees in the fall, then the birds' tailwind assistance would be negative (a headwind) but if the wind was flowing towards 225 degrees, the birds' tailwind assistance would be positive.

We included time of night in the models to account for differences in behavior of targets through the night. Time of night was categorized into 'sunset' (migratory initiation), 'sunrise' (migratory cessation) and 'middle' (ongoing migration). We arbitrarily defined 'sunset' as being 90 minutes after the end of evening civil twilight, 'sunrise' being 90 minutes before the beginning of morning civil twilight, and 'middle' representing the remainder of the night. Times for civil twilight were calculated using the `suncalc` package in `R` (v.0.5.1; Thieurmel and Elmarchraoui 2022).

The `R` package `tidyverse` (Wickham et al. 2019) was used for data manipulation and visualization and the function 'glmer' in package `lme4` (Bates et al. 2015) was used for statistical modelling. In all cases, mixed effects models were fit using the variables described above, but also including the day of the year as a random effect. Treating day as a random effect allows the model to account for additional variation in counts that is not fully captured by the weather or timing variables. Models of the total counts were fitted with a 'poisson' family (i.e., the relationship between the response and the predictor variables was on a log scale) and proportions were modelled using a 'binomial' family, which transforms the response using a log-odds ratio. Model fits were assessed by examining residual plots.

Rather than present tables of tests of significance, we describe the best fit models (using AIC) and present figures that show the relationships between the response and predictor variables. These figures provide the reader with a simple way to visualize how wind and weather influence the patterns of movements of birds at the site.

2.2 Acoustic Monitoring

A network of between 8 and 15 Audiomoths (an automated recording unit (ARU) constructed by Open Acoustic Devices; Firmware version 1.11.1) were placed throughout the Project Area (see Figure 1). ARUs were placed in open areas, in standard audiomoth cases, with microphone elements facing upwards with a clear view of the sky. The microphone element opening was covered with a tightly fit piece of saran wrap to prevent water incursion into the microphone element.

The detection range of each recording unit is estimated to be up to approximately 100-200 m for nocturnal flight calls (NFCs) of migratory birds. Some units failed prematurely (due to water issues, animal disturbance and power failures) but we obtained data for all nights, and on 100% of nights at least 8 units were operational and recording properly.

The ARUs were programmed to record at 32 kHz (the frequency range where NFCs occur) between sunset and sunrise. It is during this period that birds make NFCs while actively migrating (Evans 2002). ARUs were on a 10 min on/off duty cycle, and so captured data from approximately half of the night (which is sufficient to characterize migratory behaviour). ARUs were checked approximately every 30-45 days to replace batteries and retrieve data.

2.2.1 Acoustic Data Processing

Acoustic data were first subset to encompass only the period of time between the end of evening civil twilight and the beginning of morning civil twilight. Civil twilight was calculated using the `suncalc` package in `R` (v 0.5.1; Thieurmel and Elmarchraoui 2022). They were then processed using a custom-built artificial intelligence (AI) NFC detection model developed by TCL using the `opensoundscape` python package (Lapp et al. 2023; opensoundscape.org). The AI model was trained on a set of validated calls from comparable ARUs that have been deployed in the Maritime provinces since 2019. The NFC model assigns a 'score' to each species or species group. That probability is related to the probability that a specific acoustic detection actually is that species. In addition, all files were also processed using the `HawkEars` model (Huus et al. 2025) which was used to detect and classify heron, shorebird, nightjar, owl and thrush flight calls. It similarly provides a 'confidence' for each detection, that can be used to initially filter detections for further validation.

Species (or groups) detected by each model are presented in Table 1. Hereafter, when we refer to 'species' we are referring to either the species, or the higher level group (species group).

Table 1: Table 1. List of Species Codes and Names

Group	Code	Common Name or Group	Latin Name
Owls	leow	Long-eared Owl	*Asio otus*
	nswo	Northern Saw-whet Owl	*Aegolius acadicus*
Thrushes	gcth	Gray-cheeked Thrush	*Catharus minimus*
	heth	Hermit Thrush	*Catharus guttatus*
	swth	Swainson's Thrush	*Catharus ustulatus*
	veer	Veery	*Catharus fuscescens*
Warblers	amre	American Redstart	*Setophaga ruticilla*
	baww	Black-and-white Warbler	*Mniotilta varia*
	btbw	Black-throated Blue Warbler	*Setophaga caerulescens*
	cawa	Canada Warbler	*Cardellina canadensis*
	coye	Common Yellowthroat	*Geothlypis trichas*
	cswa	Chestnut-sided Warbler	*Setophaga pensylvanica*
	dbup	Black-throated Green/Tennessee	
	mowa	Mourning Warbler	*Geothlypis philadelphia*
	oven	Ovenbird	*Seiurus aurocapilla*
	sbds	Parula/Palm Warbler	
	zeep	Zeep Warblers - Blackpoll, Bay-breasted, Blackburnian, Magnolia, Yellow)	
Sparrows	cups	Cup Sparrow - Chipping, clay-coloured	
	savs	Savannah Sparrow	*Passerculus sandwichen*
	sfhs	Song/Fox Sparrow	
	wtsp	White-throated Sparrow	*Zonotrichia albicollis*
Shorebirds	lesa	Least Sandpiper	*Calidris minutilla*
	otsh	Other shorebirds	
	plsp	Plovers	
	sssa	Solitary/Spotted Sandpiper	
Woodcock	amwo	American Woodcock	*Scolopax minor*

All such AI models are subject to errors. As such, we validated an exhaustive set of samples of NFCs detected by both models. We use this validated set to show the within season pattern of occurrence and detection frequency for each species. Detection frequency is related to multiple factors, including the average height that a species flies, the intensity of its call, and the ability of the AI model to detect and classify it. Thus, the 'number of detections' can be roughly considered as some index of 'abundance' but should not be treated directly as such, without more knowledge of the biases above.

For the process of validation, we extracted the top two scoring calls for each species in each hour, for each day and microphone and from both models. These calls were then ordered from top scoring down, and validated as being either correctly identified or not by visualizing an enhanced spectrogram of the call (for most species), and/or by listening (some shorebirds and thrushes). We used the TCL model (ver M18T23) for all warblers and sparrows, and the `HawkEars` model (version 1.0.5) for shorebirds, thrushes, owls and Nightjars. A total of 33,523 calls were examined, 9869 of which were deemed to be valid. We used only these

validated calls (the true detections) for all subsequent analysis.

The final set of calls used for visualization and analysis is a minimal estimate of the number of calls detected on any given night of migration. It is likely related positively to the density of individuals of that species (or group) flying over the site on a given night, but the nature of that relationship is not known. The sampling and validation scheme ensures that data from all ARUs and all nights are sampled and validated, which provides robust spatial and temporal coverage of the study area.

2.3 Data Analysis

Data analysis was conducted in `Rstudio` (V. 2025.05.01) running program `R` (R Core Team 2025) V 4.0.4) and `python` V.3.10.

3 Results - spring

3.1 Radar

3.1.1 Nocturnal Migration Patterns

Approximately 50% of the total migration activity was observed on 9 nights.

The within night distribution of radar targets by time and altitude (Figure 2) highlights these nine top nights. Each plot is a separate night, with the beginning and end of civil twilight indicated by the vertical green and yellow lines, respectively. Date and time are on the x-axis and altitude is on the y-axis. Each panel is identified on the right hand side by the calendar date of the morning following migration (so 17 April is the 'migration night' that began on 16 April). Hexagonal points are radar detections divided into time and altitude bins and scaled from dark purple (few detections) through blue, green to yellow (many detections). Wind direction and strength aloft (~200-400 m) for each hour is displayed at the top of each plot using a red arrow. The air temperature at hourly periods through the night is shown by the coloured line (from black (~0 degrees) through purple and orange (~25 degrees)) at the bottom of the plot. Red lines represent the approximate altitudinal range of the rotor swept zone (50 m to 200 m).

These nights can be roughly grouped as follows. One group in mid April (17 April), one in early May (03 May, 05 May), one in mid-May (12, 14, 15 May) and one in late May (26, 27, 28 May). On all but one of those nights (26 May) there was greater activity between 200 and 1000 m compared to below, with the odds of being above (the ratio of targets above to below the beam) ranging from 0.45 to 7.75.

The night of 26 May (shown on the plot as 27 May - the next morning) shows a phenomena that has been observed at other sites in the eastern part of Nova Scotia. A headwind, combined with cooler temperatures, causes the birds to migrate at lower altitudes. A similar pattern is seen in the latter half of the night of 16-17 April.

The same plots, but showing the pattern of migratory activity across all nights for spring, is presented in Appendix A.

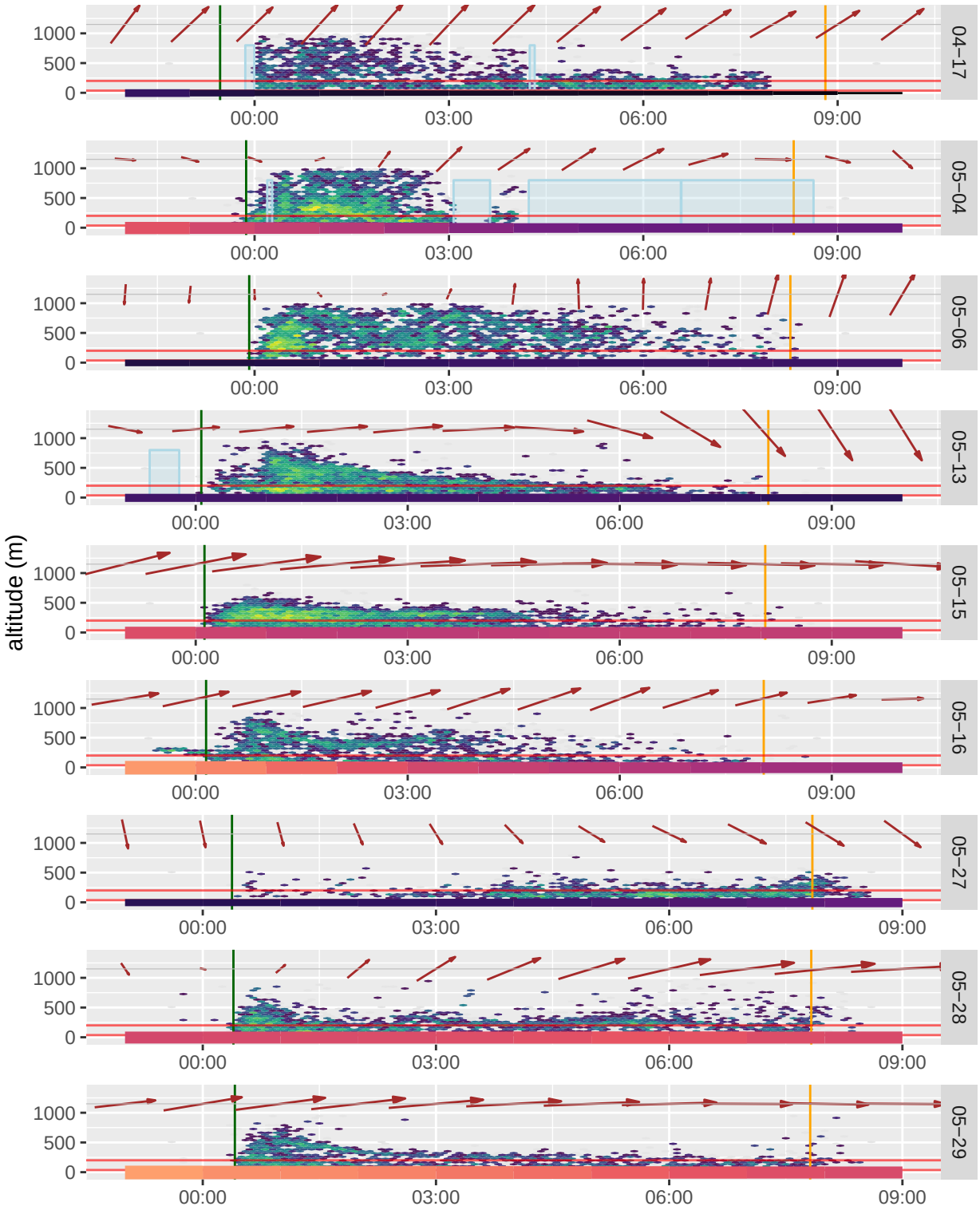

Figure 2: Major nights of migration in spring 2025

3.1.2 Numbers of Targets in Relationship to Weather Variables

The best supported (AIC) statistical models suggests that the total number of birds aloft was related to tailwind assistance, the time of night (sunset, sunrise, and middle of the night) and weather (temperature and relative humidity).

Two figures provide examples of how the number of targets aloft are related to wind (tailwind assistance) and weather (relative humidity) and how those relationships vary with time of year and time of night. In each figure, a point represents the number of targets in hourly bins, classified by time periods (panels) and month (colours). The number of targets is shown on a log axis, to improve visualization.

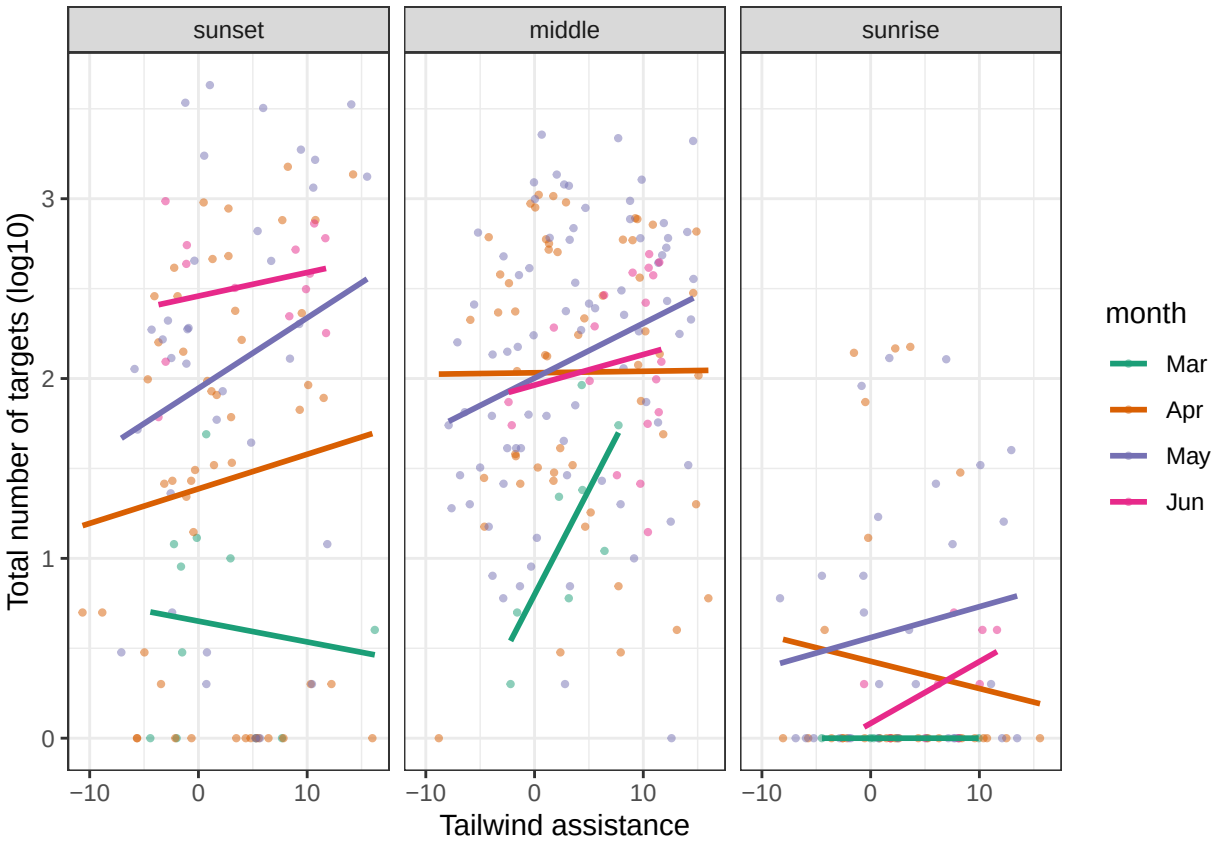

Figure 3: Relationship between Tailwind Assistance and Total Number of Targets across Time of Night and Month during Spring 2025.

Figure 3 shows how total numbers relate to tailwind assistance. Winds aloft are represented on the x-axis (km per hour) with negative values representing a headwind and positive values representing a tailwind. The lines are linear regressions for each group. The figure shows that there is a consistent positive relationship between the two variables (birds are more likely to fly as the strength of the tailwinds increase). The relationship is consistent across all periods and months except for the numbers at sunset in March, when there are few targets, and at sunrise, where there are also few targets, and the relationship varies across months. Note that the large number of targets detected in June at sunset, is likely due to insect targets that are difficult to remove from the data.

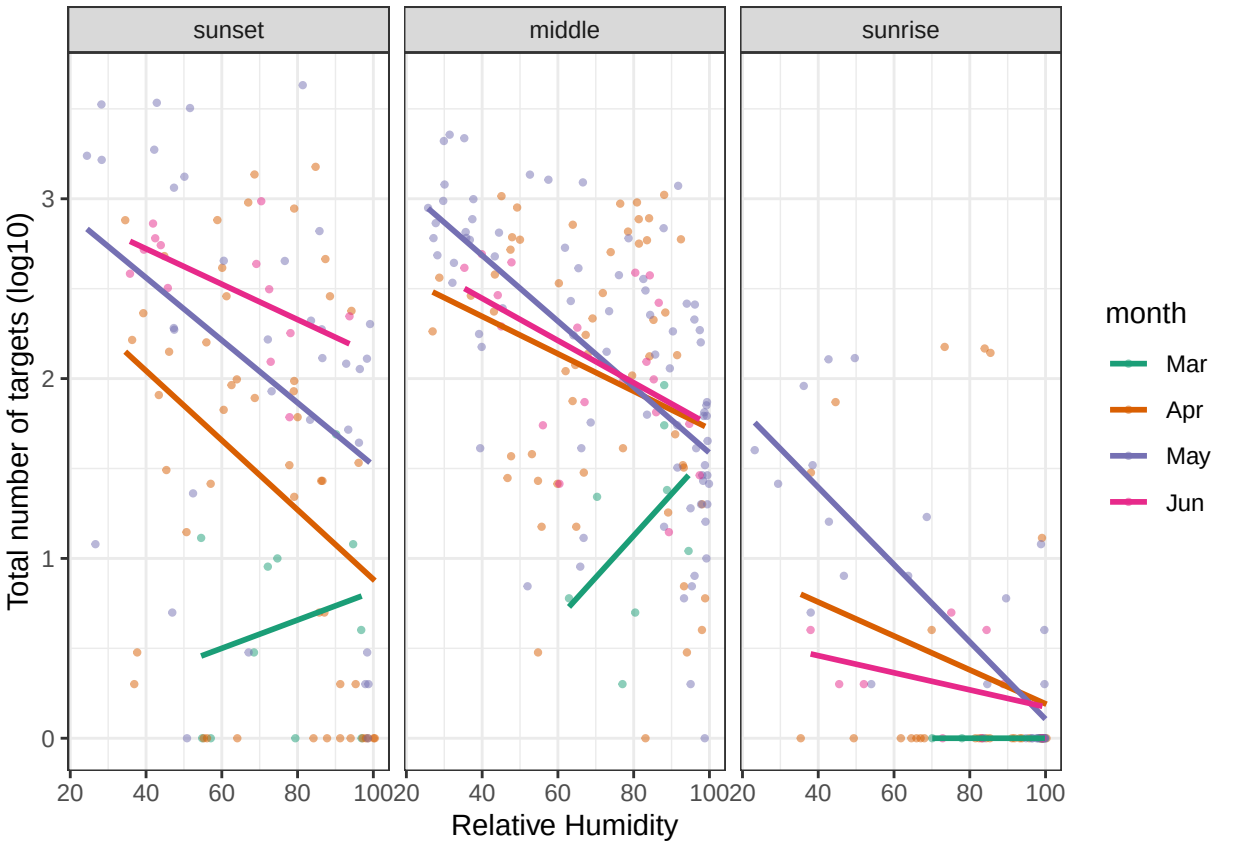

Figure 4: Relationship between relative humidity and the total number of targets across time of night and months – spring 2025.

Figure 4 shows the relationship between the number of targets detected (as described above) and relative humidity. The plot shows that this relationship is consistently negative across all months and time of night except for March (the month with few targets detected). Generally, there are fewer targets detected on nights with higher humidity.

3.1.3 Altitudinal Distribution of Radar Targets

Across all nights, most targets observed were at lower altitudes with the number of targets generally decreasing with increasing altitude (Figure 5). This decrease is partly due to an actual decrease in the number of birds, but also reflects the declining probability of detecting birds at more distant ranges. It is difficult to separate the effects of these two variables.

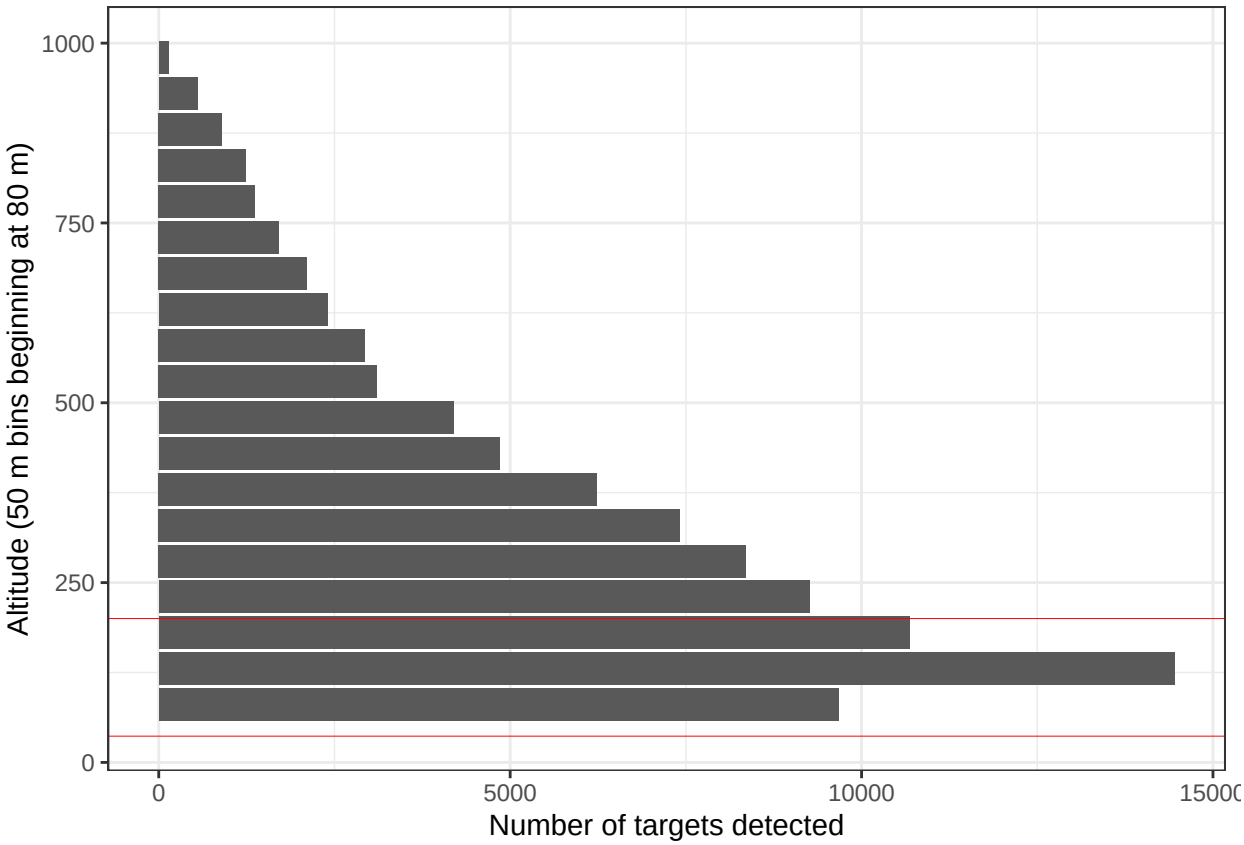

Figure 5: Radar targets by altitude – spring 2025. Red lines are at 36 m and 200 m.

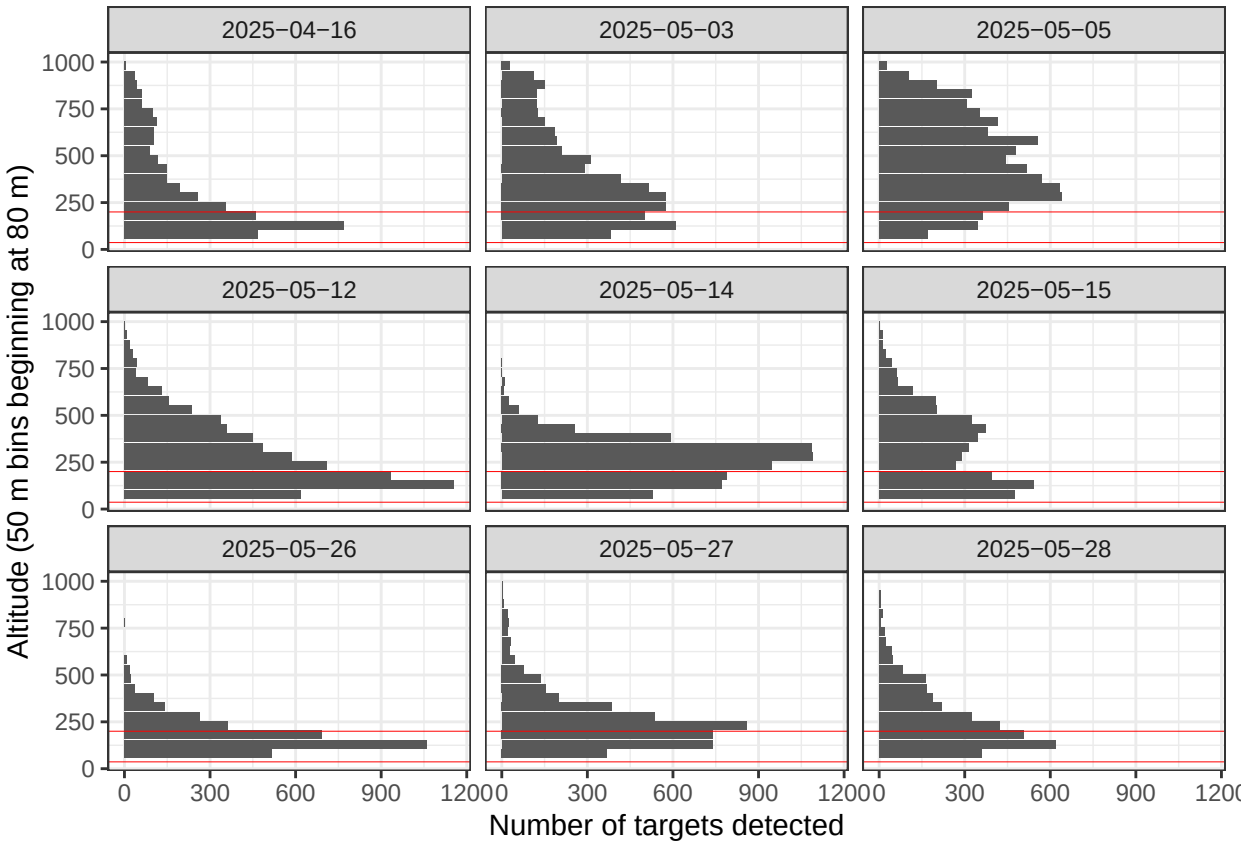

Figure 6: Radar targets by altitude for 9 major nights – spring 2025. Red lines are at 36 m and 200 m.

Figure 6 shows the density of radar detections by altitude for the 9 major nights. The pattern of radar targets by altitude varied across nights. For example, on 16 April and 26 May there are numerous targets detected between 80 and 200 m, but on 5 and 14 May, there are many more targets detected at higher altitudes.

3.1.4 The Relative Number of Birds at Lower Altitudes

The number of targets at lower altitudes is related to weather and season. We analysed this relationship by modelling how the proportion of targets flying at low altitudes (between 80 and 200 m) related to the total number of targets aloft, tailwind assistance (as described above), time of night (sunset, sunrise, and middle of the night) and weather (temperature and relative humidity). We found strong support for the relationship between the relative number flying at lower altitudes and all of the explanatory variables except surface temperature.

Again, we present two figures as examples of how the relative number of targets below vs. above 200 m is related to the total number of targets aloft, to wind (tailwind assistance) and to weather (relative humidity) and how those relationships vary with time of night. In these figures, each point represents the proportion of targets at low altitude in each hourly bin, classified by time periods (panels). The total number of targets (x axis) is shown on a log10 scale (to improve visualization).

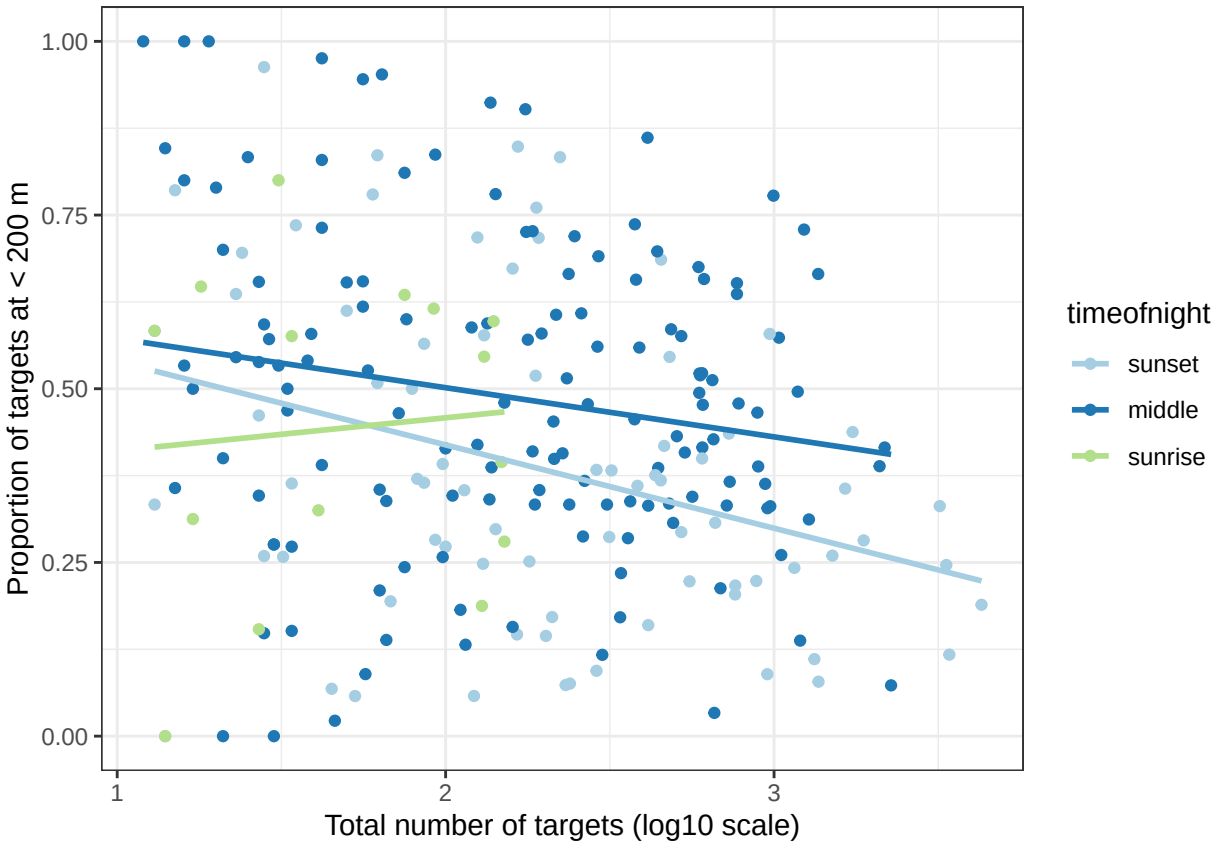

Figure 7: Proportion of targets <200 m agl in comparison to total number of targets across time of night. Plot shows only the nights with > 10 targets detected – spring 2025

Figure 7 shows that the proportion of targets between 80 and 200 m agl decreases as the number of targets increases, except at sunrise. At sunrise, we see fewer targets, but a greater proportion at somewhat higher densities. This occurs during the period when birds are re-orienting to their stopover areas.

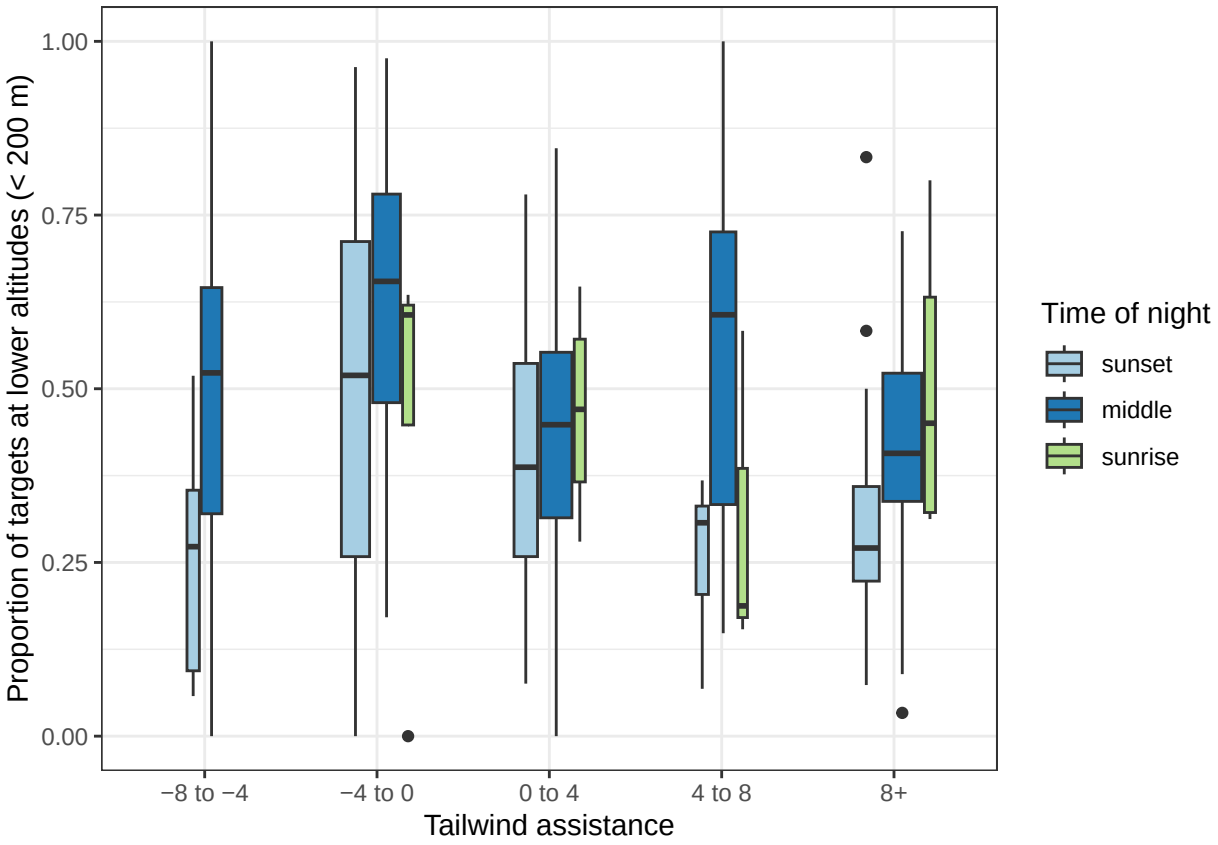

Figure 8: Proportion of targets at low altitude in comparison to the degree of tailwind assistance – spring 2025. The box shows the boundaries of middle 50% of the data. The width of the boxplot shows the relative number of targets in that category.

The boxplots in Figure 8 that show how the distribution of proportions of targets between 80 and 200 m changes with time of night and tailwinds. The width of each boxplot is proportional to the total number of targets in that category. As tailwind assistance increases, the number of targets increases, but the proportion of targets between 80 and 200 m decreases. However, this relationship is not simple; in the middle of the night with light headwinds, and medium tailwinds, there are more targets detected at lower altitudes.

3.2 Acoustic

3.2.1 Nocturnal Flight Call Detections

Figure 9 shows the distribution of all NFC detections by night through the spring, accumulated into broad species groups. (Note that the y axis is scaled differently for each species group). The general pattern is as expected in the region, with the bulk of detections being sparrows early in the season and with warblers arriving later in the season. Shorebirds and Thrushes were detected at low numbers throughout the period. No Nightjars were detected.

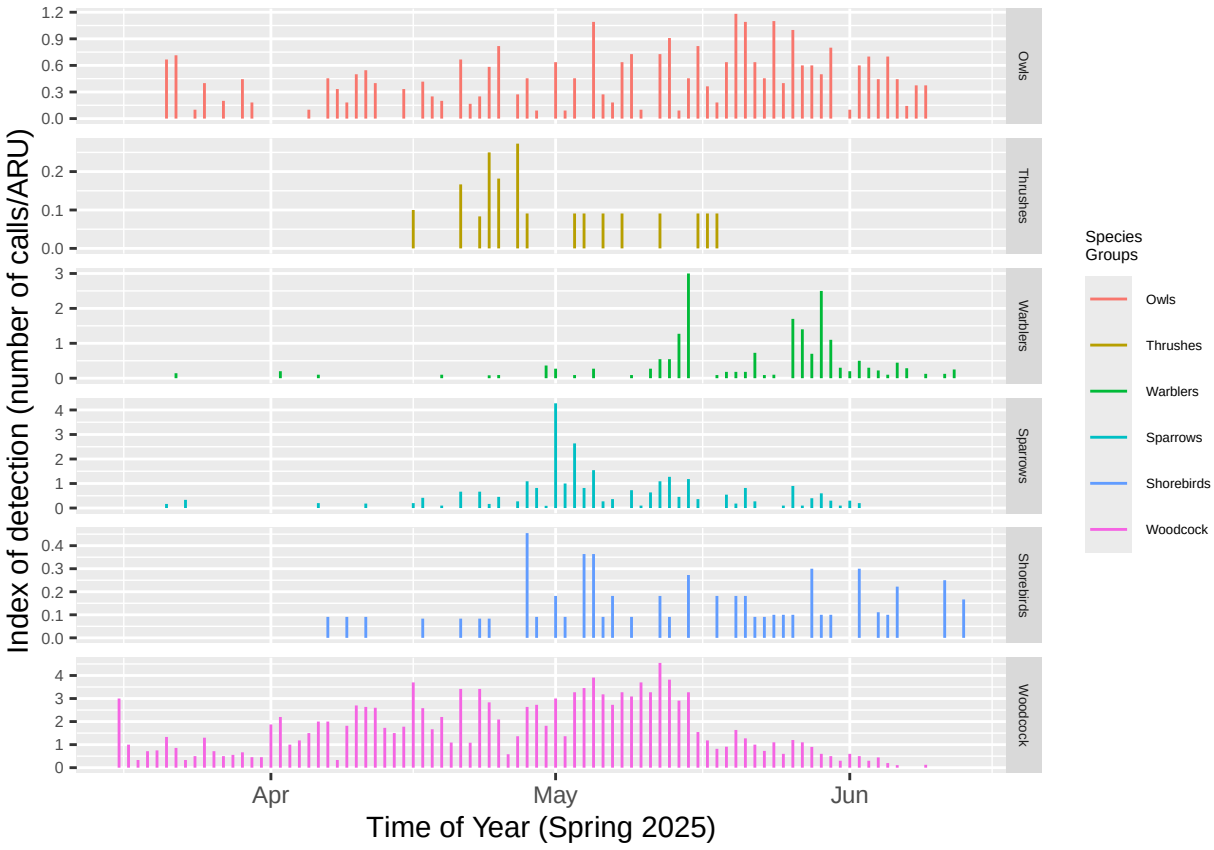

Figure 9: Nocturnal flight call detections by species group and time of year – spring 2025

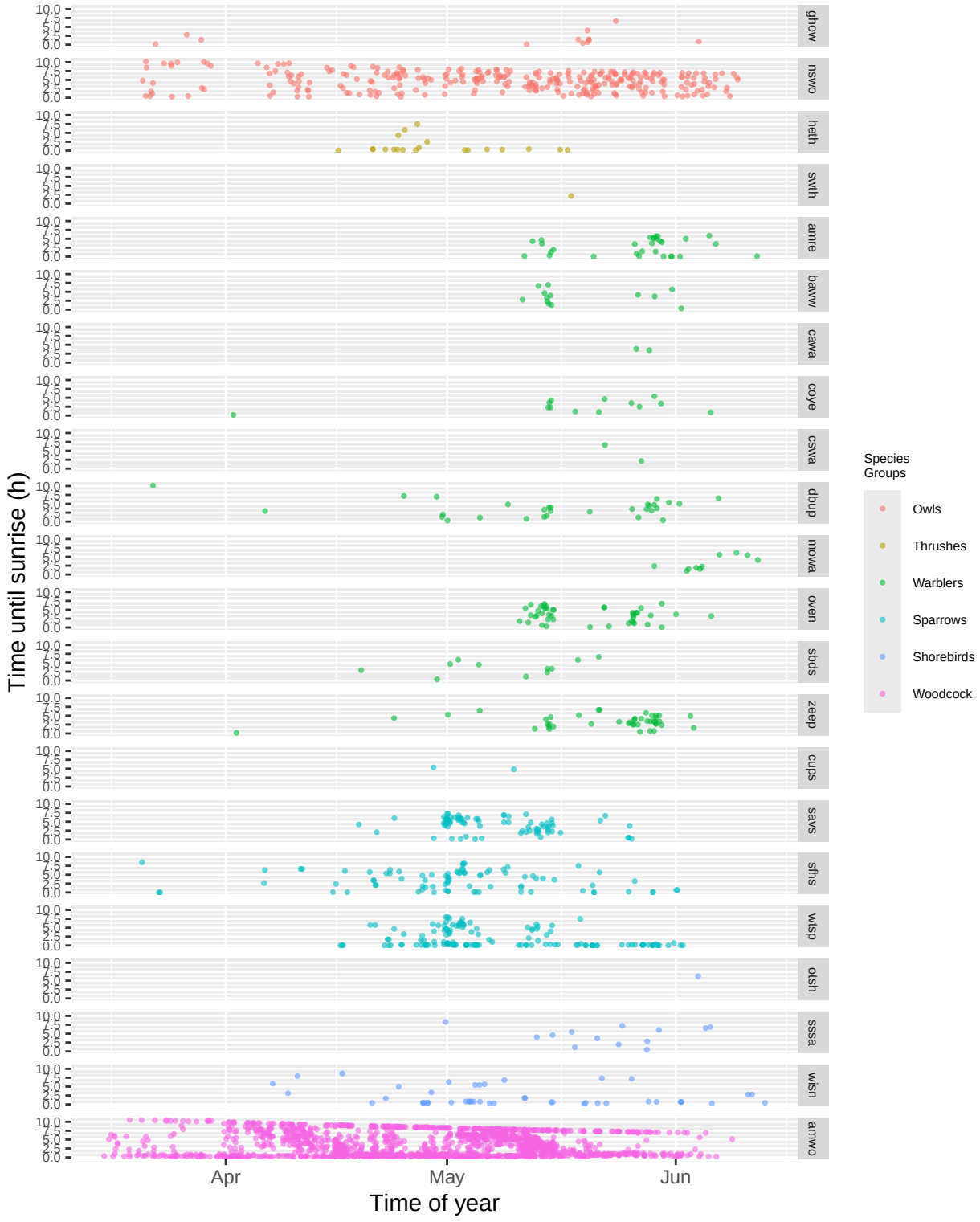

Figure 10: Nocturnal flight call detections by species and time of year – spring 2025

Figure 10 shows the distribution of the same acoustic detections across the season, separated by species. Each dot represents one validated detection for one species. They are plotted on a separate panel for each

species, with the time of the detection (relative to sunrise) on the y axis, and the time of year on the x axis. Notice that for crepuscular species (woodcock) most detections are at sunset or sunrise which represents individuals singing during courtship displays, whereas for other species (e.g. most warblers) the detections are throughout the night.

4 Results - fall

4.1 Radar

4.1.1 Nocturnal Migration Patterns

Approximately 45% of the total migration activity was observed across 9 nights. The within night distribution of radar targets (by time and altitude) for these nine top nights is presented in Figure 11. Plots are as described for the spring.

There are roughly three groups of peak migration nights. One in mid September (10, 13, 17 September) one in late September (25, 29 September, 1 and 2 October) and one in mid October (11, 12 October). On all but one of those nights (17 September) there was greater activity between 200 and 1000 m compared to below, with the odds of being above (the ratio of targets above to below the beam) ranging from 0.98 to 1.83.

The night of 13 September shows a similar phenomena to what was observed in the spring - cooler temperatures are related to the birds flying at lower altitudes.

A comparable plot, but showing the pattern of migratory activity across all nights for fall, is found in Appendix B.

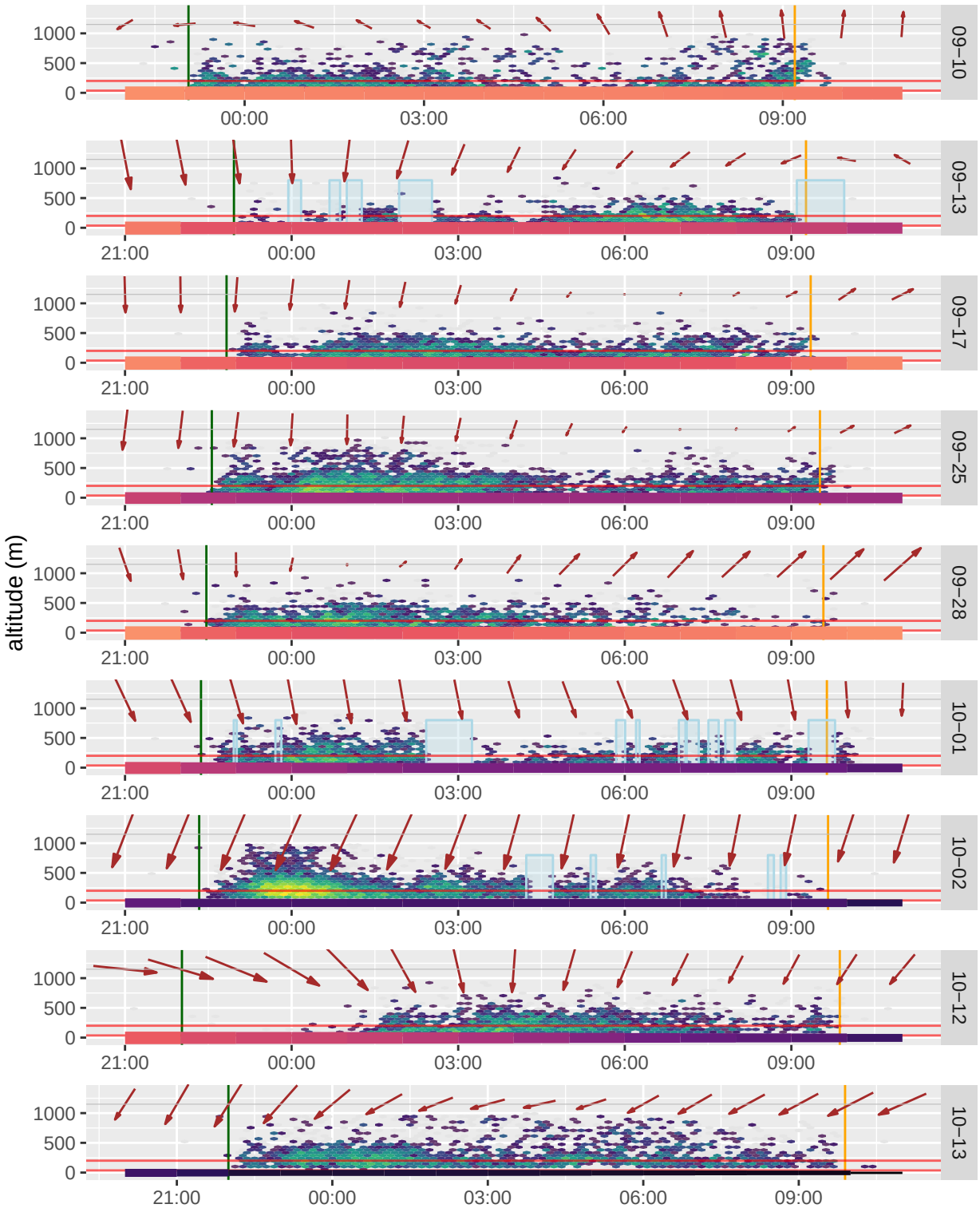

Figure 11: Major nights of migration – fall 2025

4.1.2 Numbers of Targets in Relationship to Weather Variables

The best supported (AIC) statistical models suggests that the total number of birds aloft was related to tailwind assistance, the time of night (sunset, sunrise, and middle of the night) and weather (temperature and relative humidity).

Two figures provide examples of how the number of targets aloft are related to wind (tailwind assistance) and weather (relative humidity) and how those relationships vary with time of year and time of night. In each figure, a point represents the number of targets in hourly bins, classified by time periods (panels) and month (colours). The number of targets is shown on a log axis, to improve visualization.

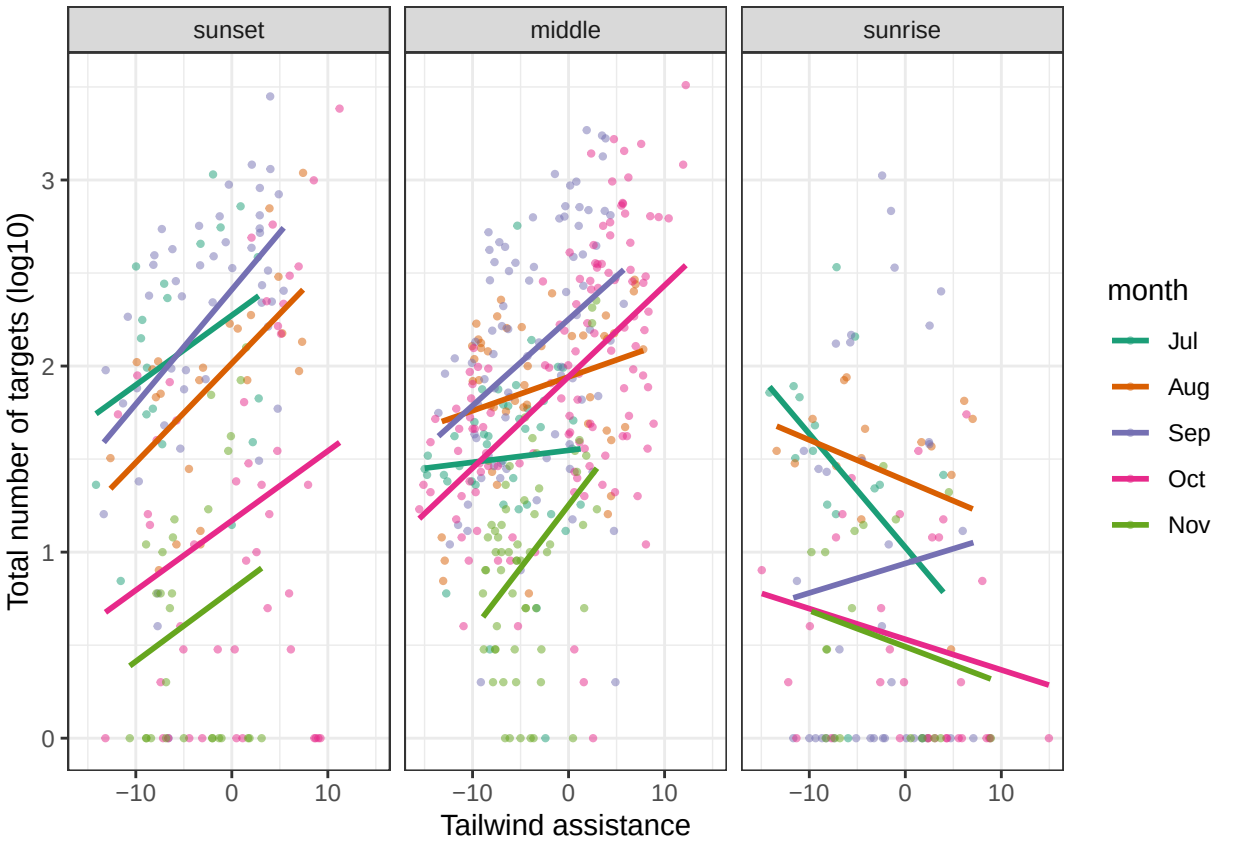

Figure 12: Relationship between tailwind assistance and total number of targets across time of night and month – fall 2025.

Figure 12 shows how total numbers relate to tailwind assistance. Winds aloft are represented on the x-axis (km per hour) with negative values representing a headwind and positive values representing a tailwind. The lines are linear regressions for each group. The figure shows that there is a consistent positive relationship between the two variables (birds are more likely to fly as the strength of the tailwinds increase) except at sunrise, when the relationship is negative.

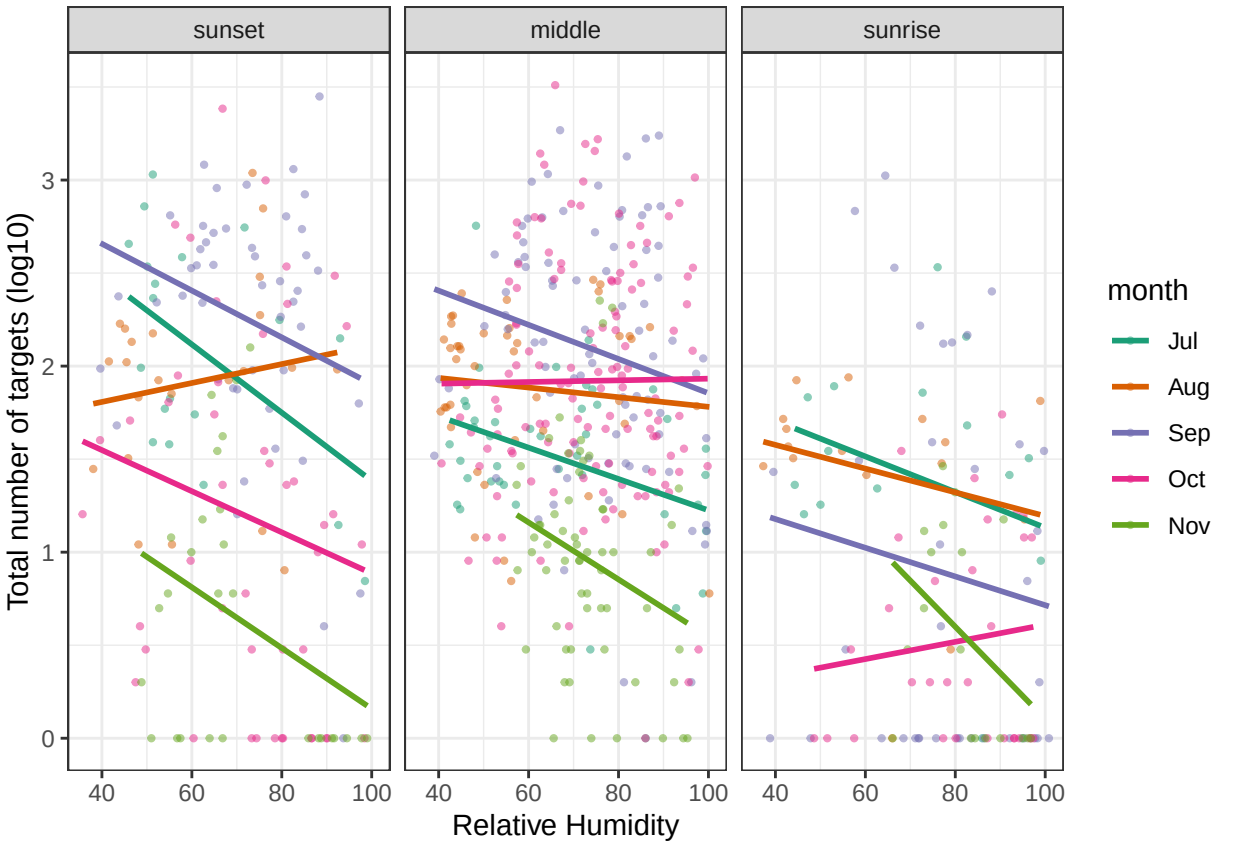

Figure 13: Relationship between relative humidity and total number of targets across time of night and months – fall 2025.

Figure 13 shows the relationship between the number of targets detected (as described above) and relative humidity. The plot shows the typical pattern of a negative relationship across all months and time of night except for August at sunset and October in the middle of the night and sunrise.

4.1.3 Altitudinal Distribution of Radar Targets

Across all nights, most targets observed were at lower altitudes with the number of targets generally decreasing with increasing altitude (Figure 14). This decline is partly due to an actual decrease in the number of birds, but also reflects the declining probability of detecting birds at more distant ranges. It is difficult to separate the effects of these two variables.

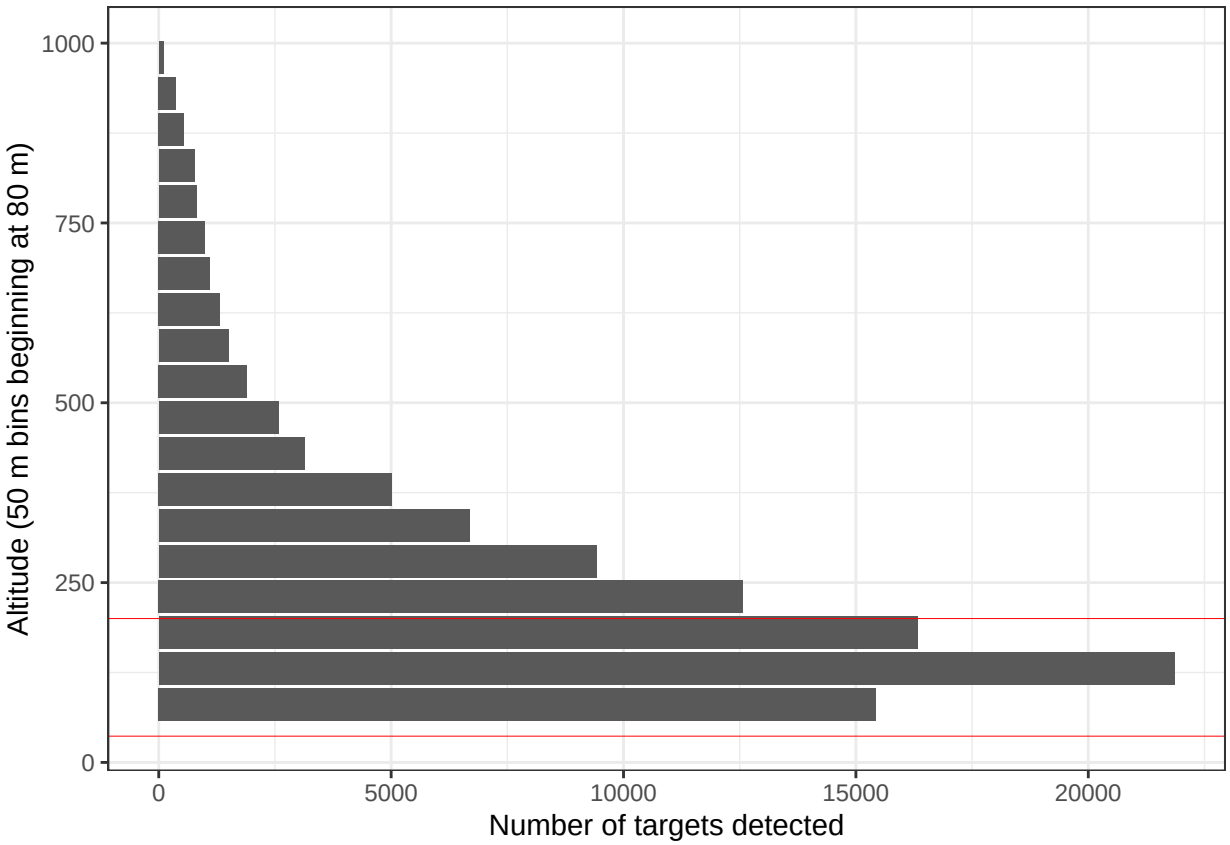

Figure 14: Radar targets by altitude – fall 2025. Red lines are at 36 m and 200 m.

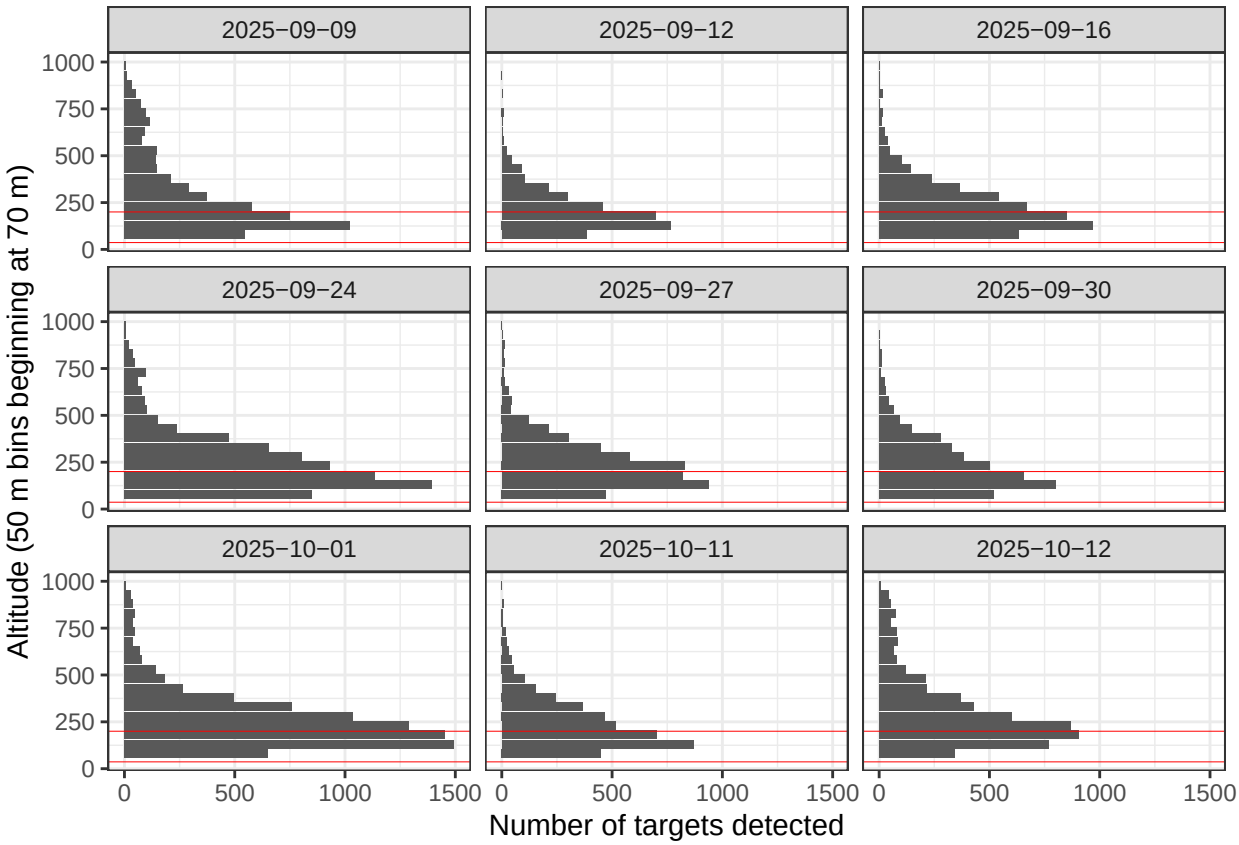

Figure 15: Radar targets by altitude for select nights during fall 2025. Red lines are at 36 m and 200 m.

Figure 15 shows the density of radar detections by altitude for the 9 major nights. The pattern of radar targets by altitude varied across nights. For example, on 1 October the numbers of targets at lower altitudes was greater relative to the other nights.

4.1.4 The Relative Number of Birds at Lower Altitudes

The number of targets at lower altitudes is related to weather and season. As for the spring data, we analysed this relationship by modelling how the proportion of targets flying at low altitudes (between 80 and 200 m) related to the total number of targets aloft, tailwind assistance (as described above), time of night (sunset, sunrise, and middle of the night) and weather (temperature, surface pressure and relative humidity). There was strong support for the relationship between the relative number flying at lower altitudes and all of the explanatory variables except surface temperature.

Again, we present two figures as examples of how the relative number of targets below vs. above 200 m is related to the total number of targets aloft, to wind (tailwind assistance) and to weather (relative humidity) and how those relationships vary with time of night. In these figures, each point represents the proportion of targets at low altitude in each hourly bin, classified by time periods (panels). The total number of targets (x axis) is shown on a log10 scale (to improve visualization).

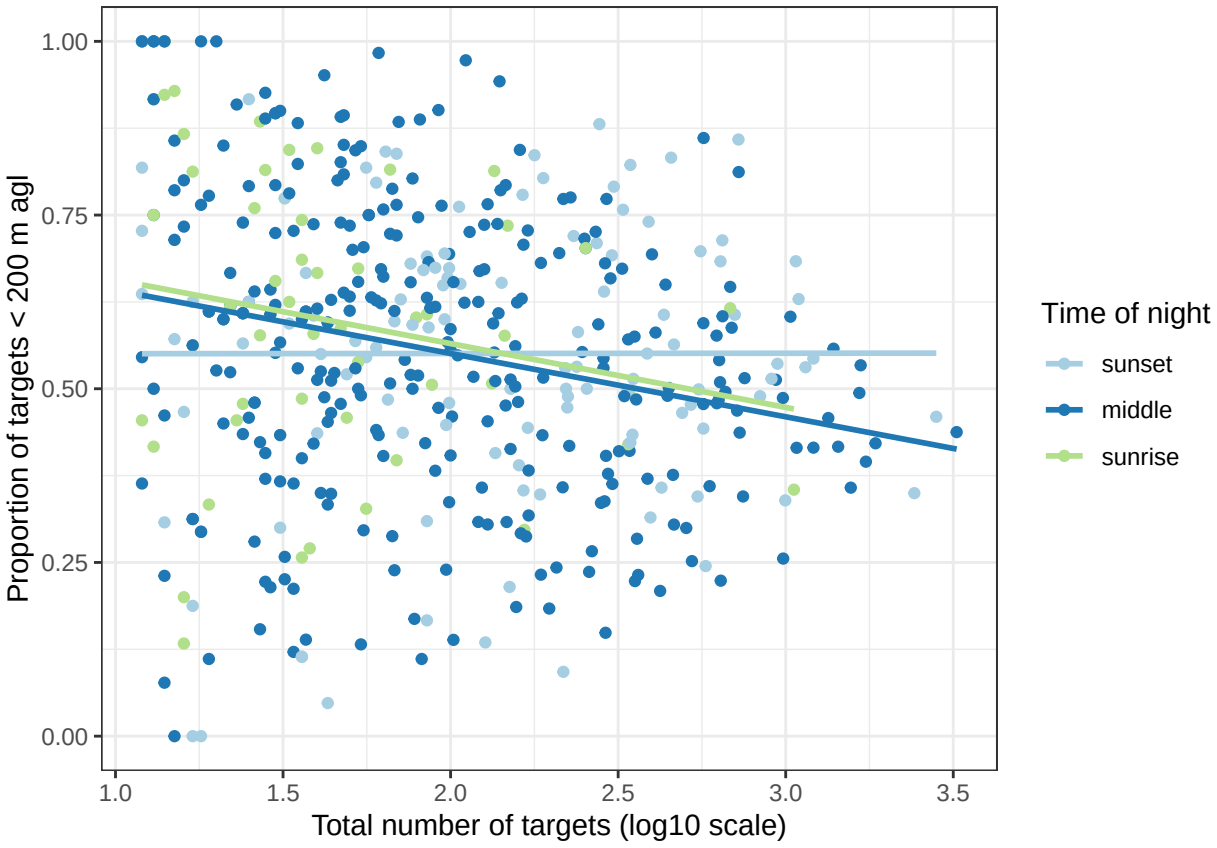

Figure 16: Proportion of targets <200 m agl in comparison to total number of targets across time of night – fall 2025. Plot shows only the nights with > 10 targets detected

Figure 16 shows that the proportion of targets at lower altitudes (between 80 and 200 m) decreases as the number of targets increases, except at sunrise.

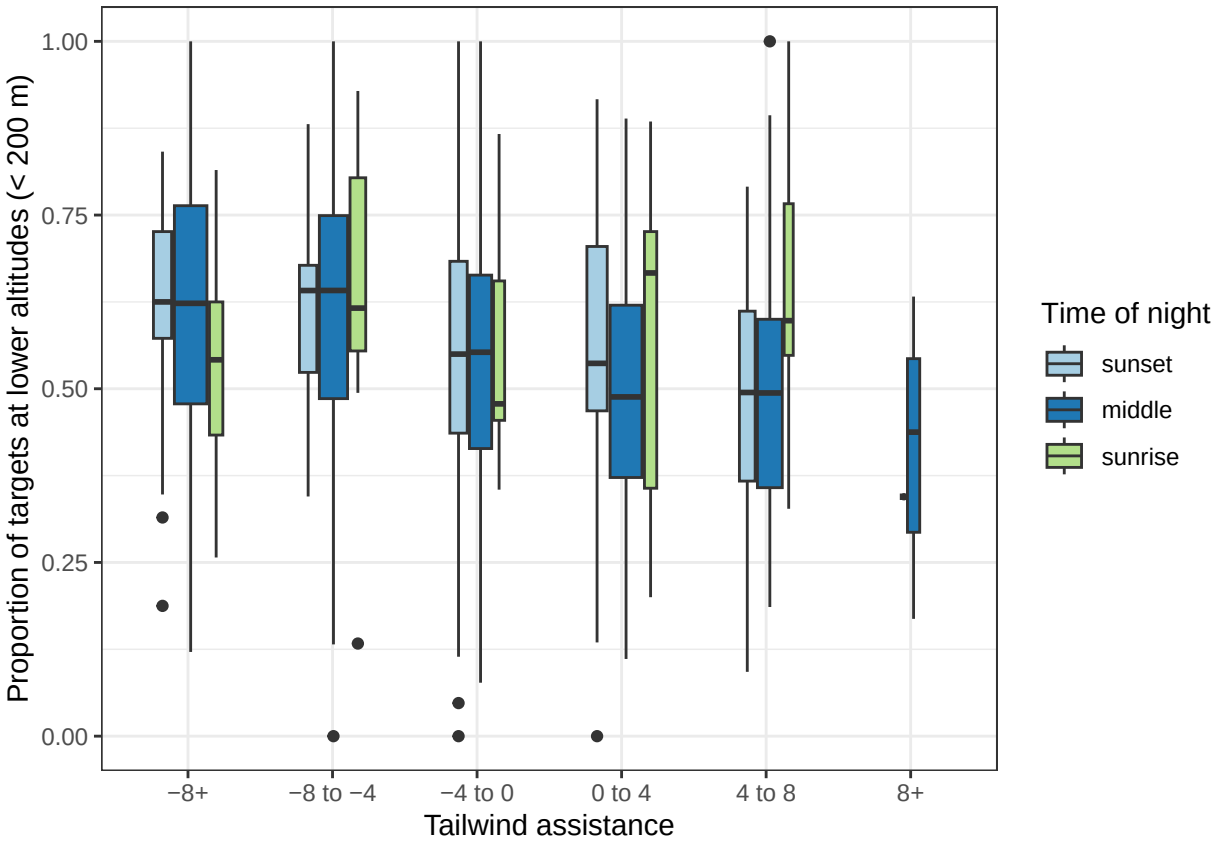

Figure 17: Proportion of targets between 80 and 200 m agl related to the amount of tailwind assistance – fall 2025. The box shows the boundaries of middle 50% of the data. The width of the boxplot shows the relative number of targets in that category.

The boxplots in Figure 17 that show how the distribution of proportions of targets detected between 80 and 200 m changes with time of night and tailwinds. The width of each boxplot is proportional to the total number of targets in that category. As tailwind assistance increases the proportion of targets between 80 and 200 m decreases. This is especially true in the middle of the night, where most targets are detected.

4.2 Acoustic

4.2.1 Nocturnal Flight Call Detections

Figure 18 shows the distribution of all NFC detections by night through the fall, accumulated into broad species groups. (Note that the y axis is scaled differently for each species group). The general pattern is as expected in the region, with the bulk of detections from the warblers (arriving early in the period), followed by thrushes and then sparrows. Shorebirds and owls were detected at low numbers throughout the period. Interestingly, no nightjars (Common Nighthawk) were present during late August (their migratory period).

Figure 18: Nocturnal flight call detections by species group and time of year – fall 2025

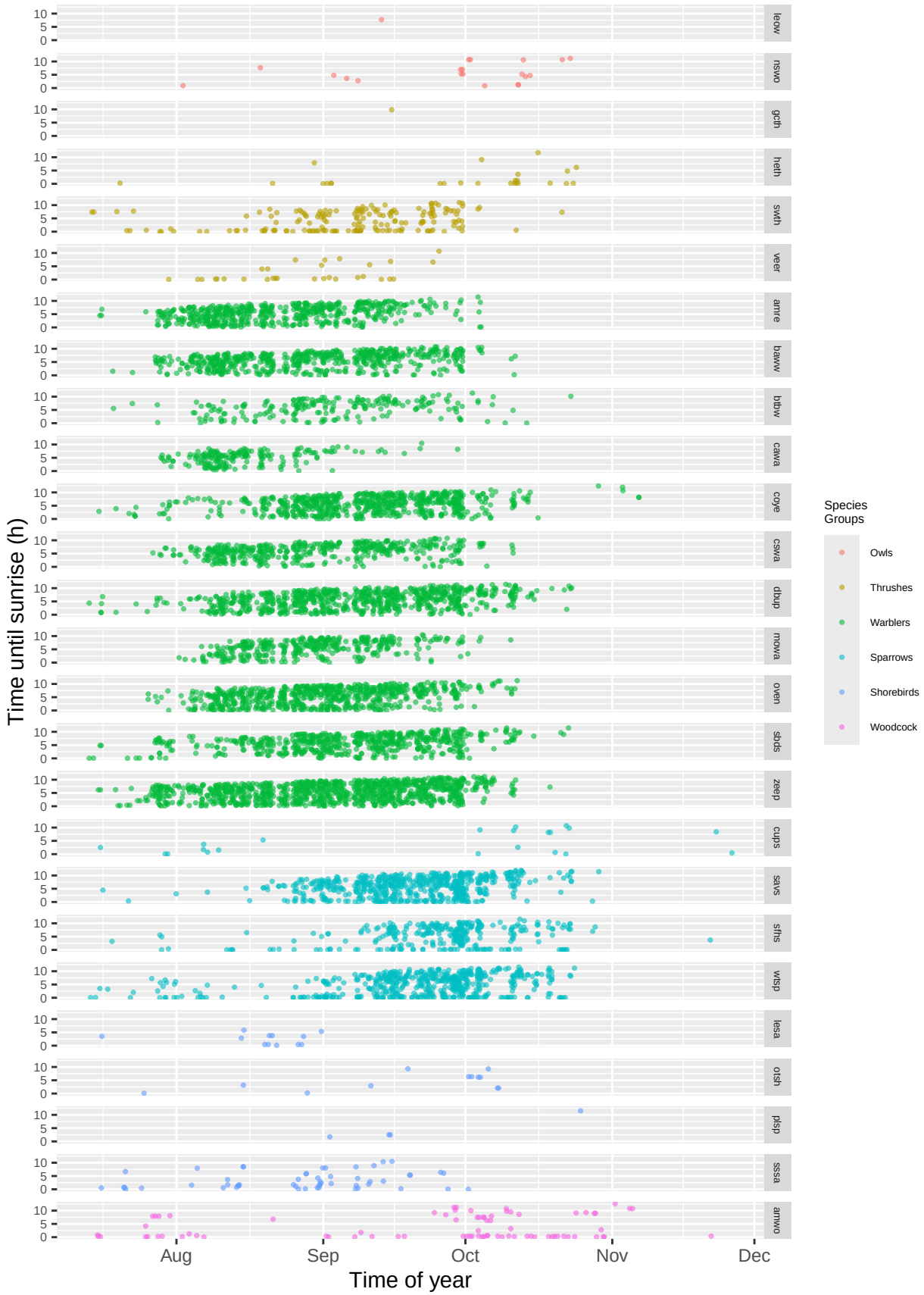

Figure 19: Nocturnal flight call detections by species and time of year – fall 2025

Figure 19 shows the distribution of the same acoustic detections across the season, separated by species. Each dot represents one validated detection for one species. They are plotted on a separate panel for each species, with the time of the detection (relative to sunrise) on the y axis, and the time of year on the x axis. It can be seen in the plot that numbers of acoustic detections trail off dramatically by late October.

We detected 181 NFCs of Canada Warbler during the fall period. The area is a known migratory route for the species, so this number is not necessarily unusual. Most detections (152) were in the month of August. Only 4 of those August detections were during the sunset or sunrise period, suggesting that the these detections are of individuals during nocturnal migration, and that the area is not used as a migratory stopover site for the species.

5 Summary

Radar monitoring was nearly continuous throughout the fall season with the exception of the pause during the extreme fire period in the latter half of August. Acoustic monitoring continued during that period and adequately sampled migration.

Low detection rates in March and November confirm that our sampling sufficiently covered the temporal period of bird migration in the area.

Targets were detected at various heights throughout the area sampled (i.e., between 80 m and 1000 m). Given that the probability of detecting small birds decreases as distance from the radar increases, the decrease in number of detections of birds higher than 400-600 m likely results from a combination of fewer birds aloft and a decreased detectability. However, we observed that when large numbers of targets were present, the proportion between 80 and 200 m agl averaged about 40-45%, a number consistent with proportions estimated in Europe (Hoekstra et al. 2025) and around the Great Lakes (Cohen et al. 2022) using large-scale weather radar systems.

On several nights, particularly in the spring, we observed a large proportion of migrants flying at altitudes between 80 and 200 m agl. In the spring, this phenomenon appears to be related to lower temperatures (or changes in temperature) and headwinds. We suggest that this phenomena may pose some risk to migratory birds here, and so should be further studied. More specifically, it would be useful to study the relationship between post-construction mortality and nights with lower temperatures to inform adaptive management strategies for the project area.

Most radar and acoustic activity was observed during the middle portion of the night. However, during sunrise (when birds may be landing) we observed a higher proportion of targets at lower altitudes, when there were many targets detected. This can be visually seen in the figure showing the subset of high volume nights (Figures 6 and 15).

Most activity was observed when favourable tailwinds were present and with little to no precipitation. These findings are consistent with other radar and acoustic studies completed in Atlantic Canada (e.g., Peckford and Taylor 2008) and elsewhere (Shamoun-Baranes et al. 2017, Cohen et al 2022).

The composition of the species detected via ARUs were consistent with the range of species known to migrate into and through the Atlantic Provinces in the spring and fall. The timing of those species was also as expected, with most warblers detected in early September, and sparrows observed through September and October. There were no Common Nighthawks detected either during the breeding season (early June) or during migration (mid-August) which suggests that this area is not a migratory route for that species. The large numbers of Canada Warbler acoustic detections were almost exclusively during the night, suggesting that although these birds are flying through the area, they are not using it for migratory stopover.

6 Limitations

Data interpretation is subject to the following limitations.

6.1 Radar

Radar data can provide a good understanding of nocturnal avian migration trends at proposed wind energy project areas. However, there are limitations to how the data are collected and can be interpreted, such as:

- While it is assumed that most targets are migratory birds, some proportion of targets may be from insects, bats, clutter and or precipitation. Our methods attempt to maximize bird detections and minimize detections from other sources (particularly clutter and insects) but directly assessing how well these methods work is very difficult or impossible.
- Species identification using radar alone is not possible.
- As distance from the radar increases, the detection probability of small (i.e., passerine sized) targets decreases. Because we know migration density decreases with increased altitude, the interplay between detection probability and migrant behaviour is difficult to measure.
- Detections at very low altitudes (i.e., below 70 m) are difficult to capture due to topography and tree cover which cause clutter in the radar signal.

6.2 Acoustic

While NFC calling rates provide a good representation of migratory activity (e.g., species present, trends in activity), there are many factors that influence calling rates; several of which are:

- Microphone sensitivity (detection rates may change based on weather, background noise, vegetation cover, and technology).
- Time of year (it is unknown how calling rates vary with time of year and species).
- Time of night (calling rates may be higher during the early portion of the night to entice stopovers to initiate migratory flight, or in the morning, when individuals are choosing to land for the day). The influence this has on detection rates is poorly understood.
- Weather conditions (it is unknown how weather conditions may impact calling rates).
- Density of migrants (it is unknown if calling rates increase or decrease with increased migrant density).
- Species composition (while it is known that not all species call, the calling frequency is known for many species that do produce NFCs).
- The type of model used for detection and classification will influence the number of detections obtained.

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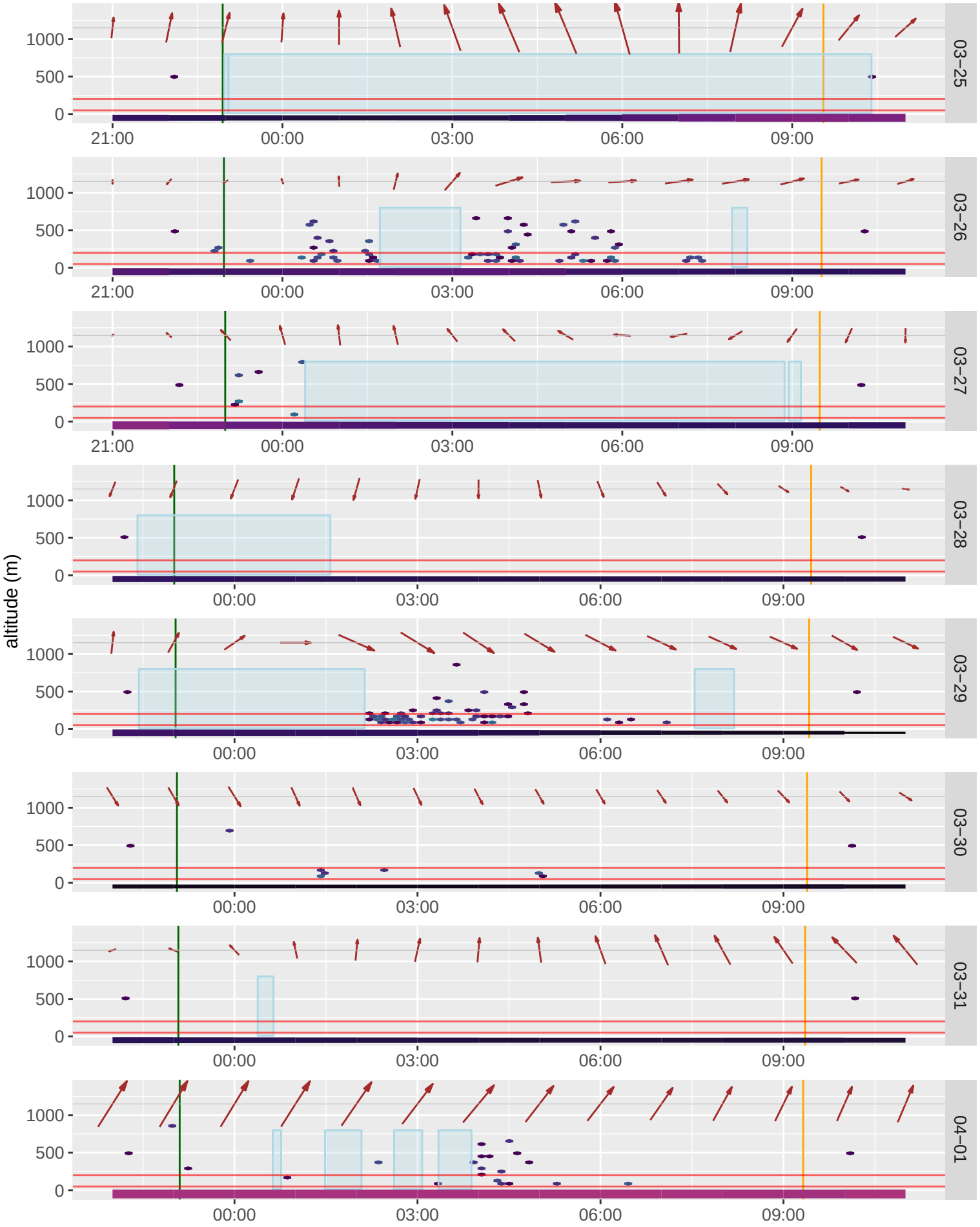
7.1 Appendix A. Full presentation of all radar data collected at proposed Eigg Mountain Wind Project during spring 2025. Each panel represents one night of migration. Each plot is a separate night, with the beginning and end of civil twilight indicated by the vertical green and yellow lines, respectively. Date and time are on the x-axis and altitude is on the y-axis. Each panel is identified on the right hand side by the calendar date of the morning following migration (so 17 April is the 'migration night' that began on 16 April). Hexagonal points are radar detections divided into time and altitude bins and scaled from dark purple (few detections) through blue, green to yellow (many detections). Wind direction and strength aloft (~200-400 m) for each hour is displayed at the top of each plot using a red arrow. The air temperature at hourly periods through the night is shown by the coloured line (from black (~0 degrees) through purple and orange (~25 degrees)) at the bottom of the plot. Red lines represent the approximate altitudinal range of the rotor swept zone (36 m to 200 m).

7.2 Appendix B. Full presentation of all radar data collected at proposed Eigg Mountain Wind Project during fall 2025. Panels as described for Appendix A.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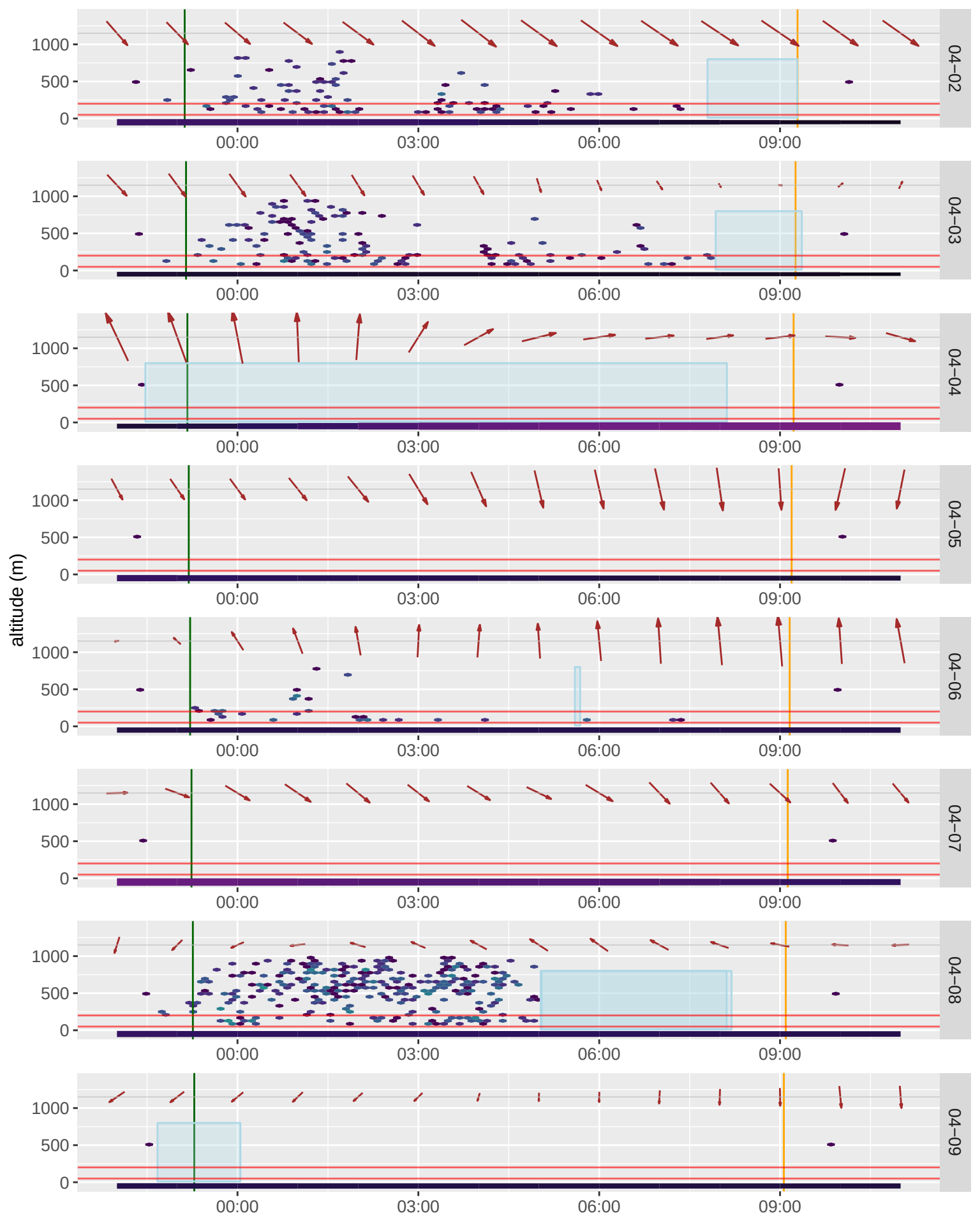
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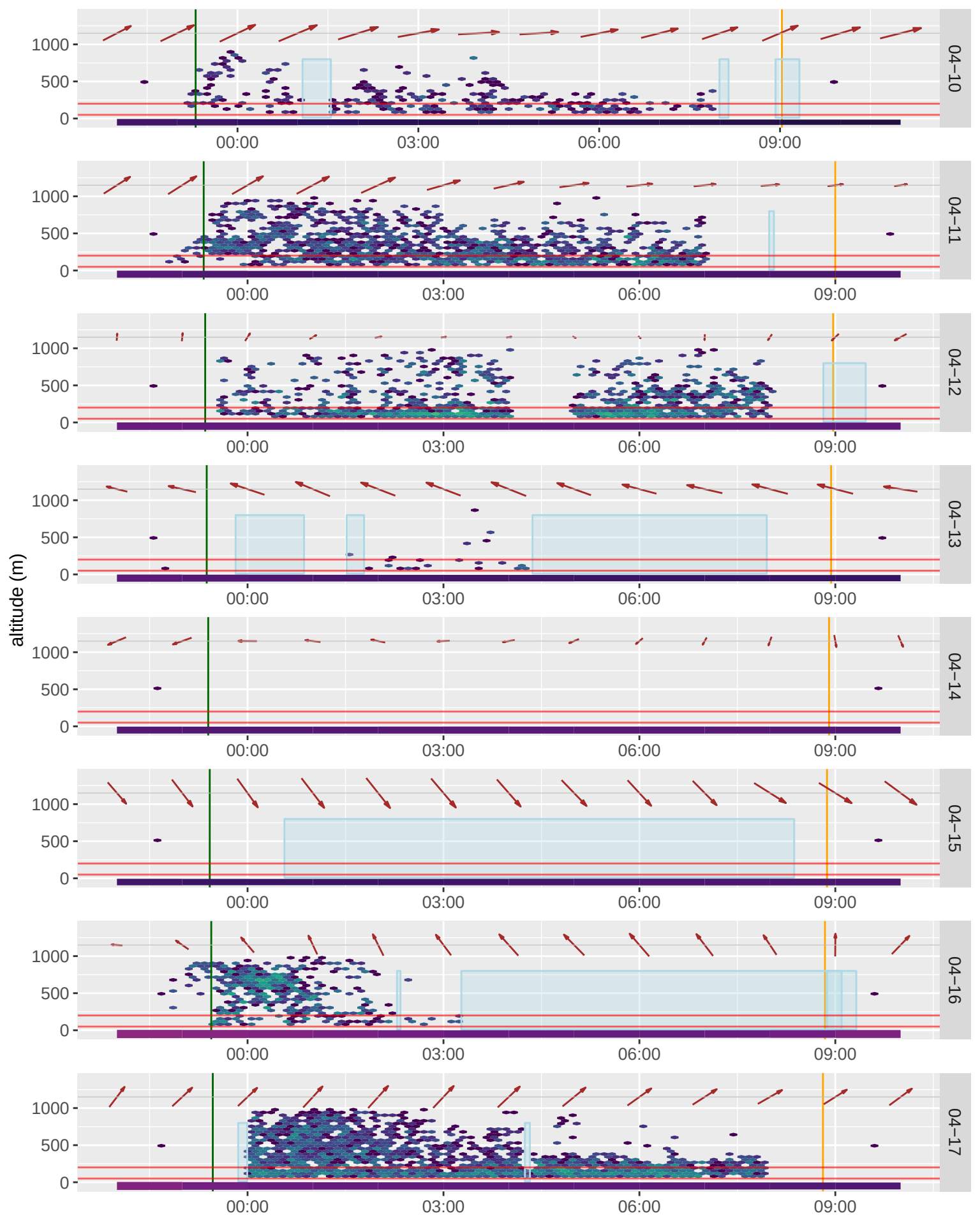
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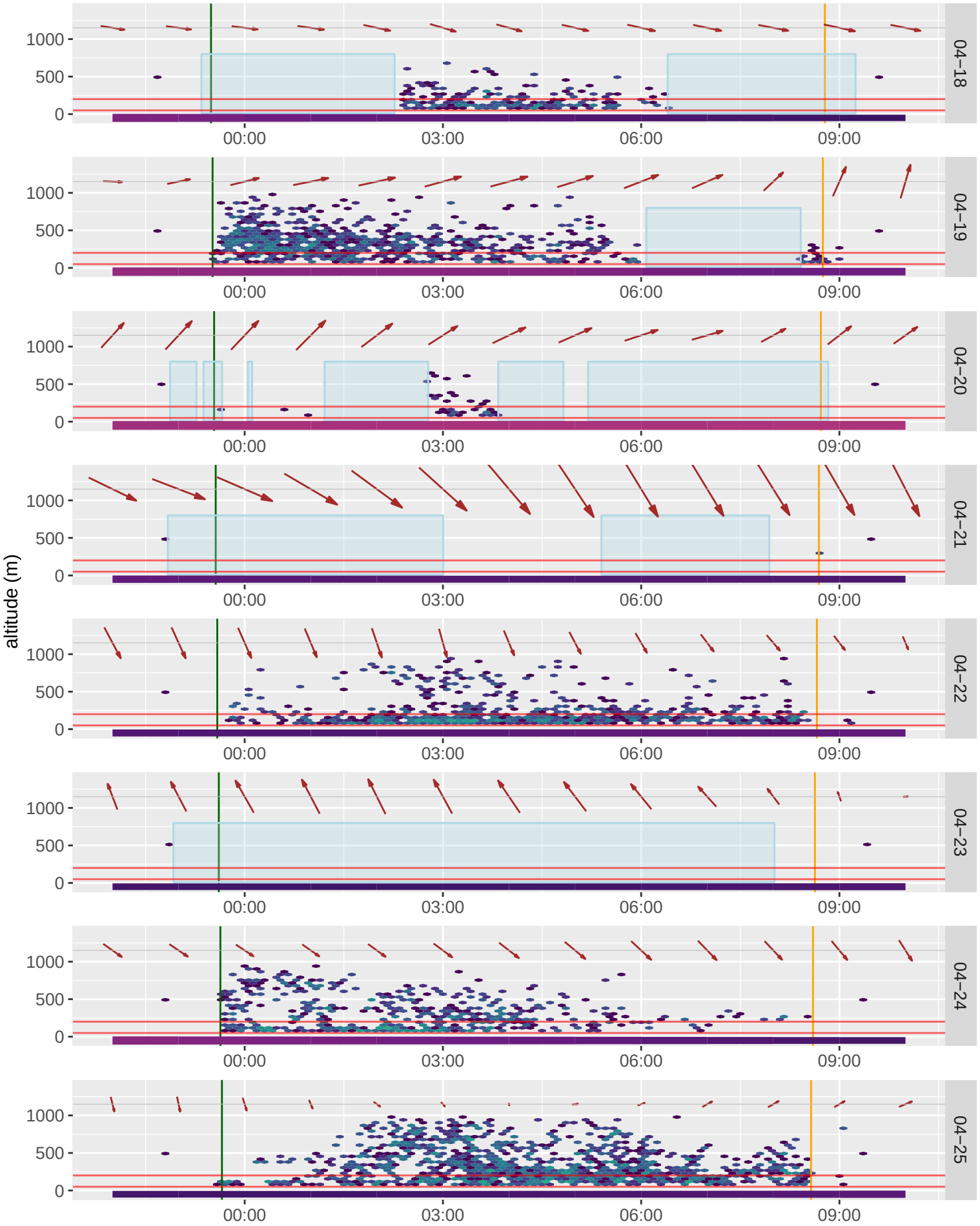
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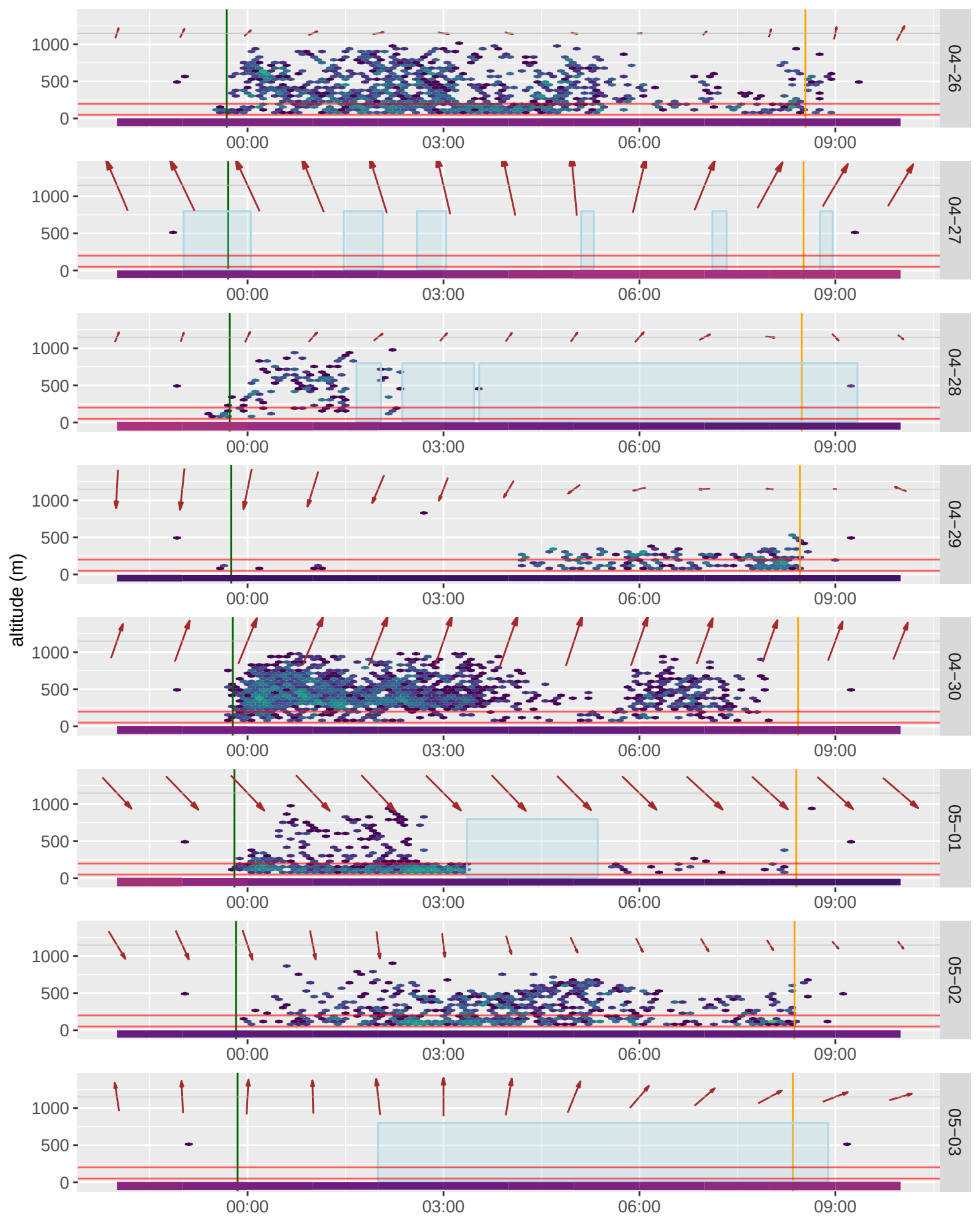
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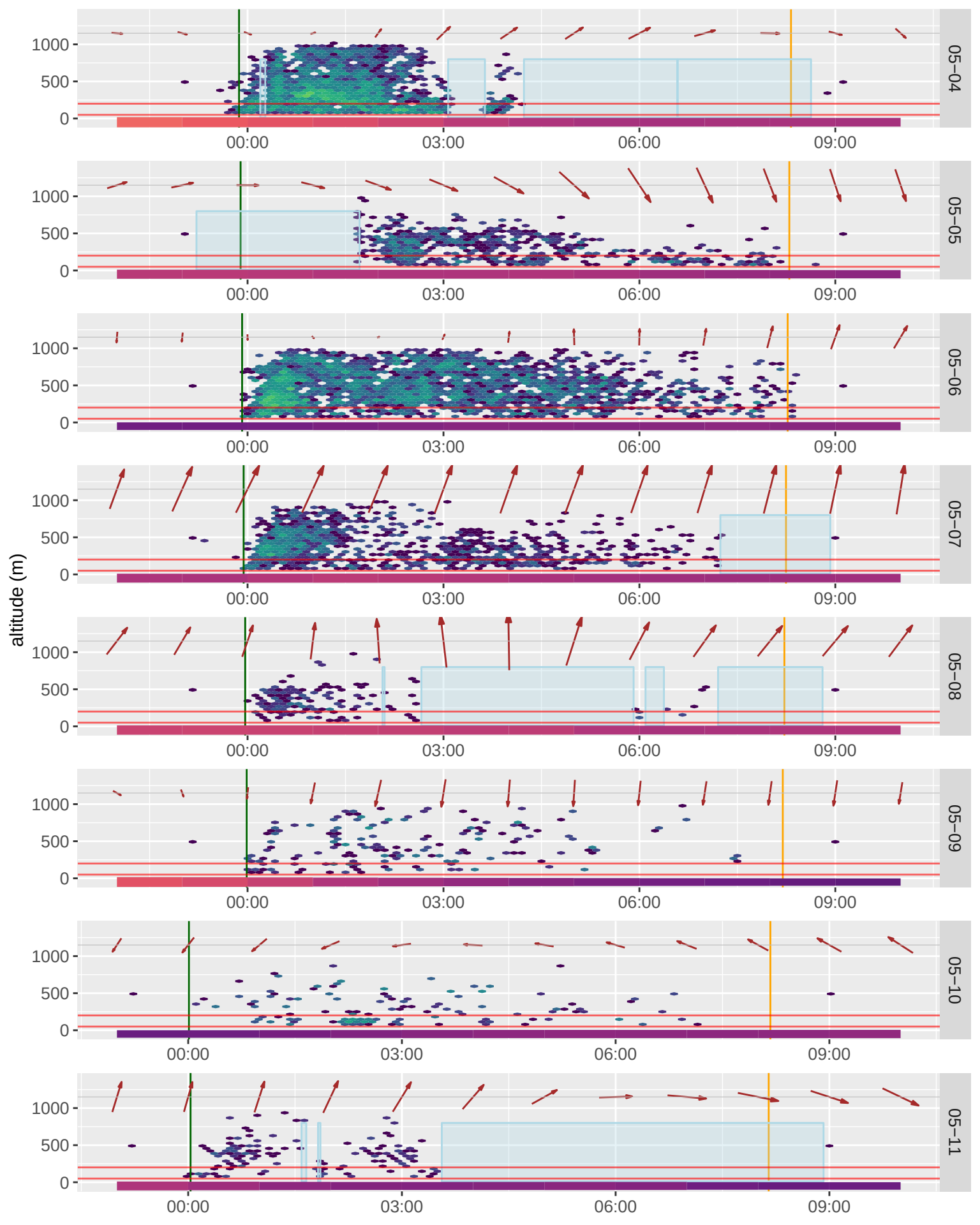
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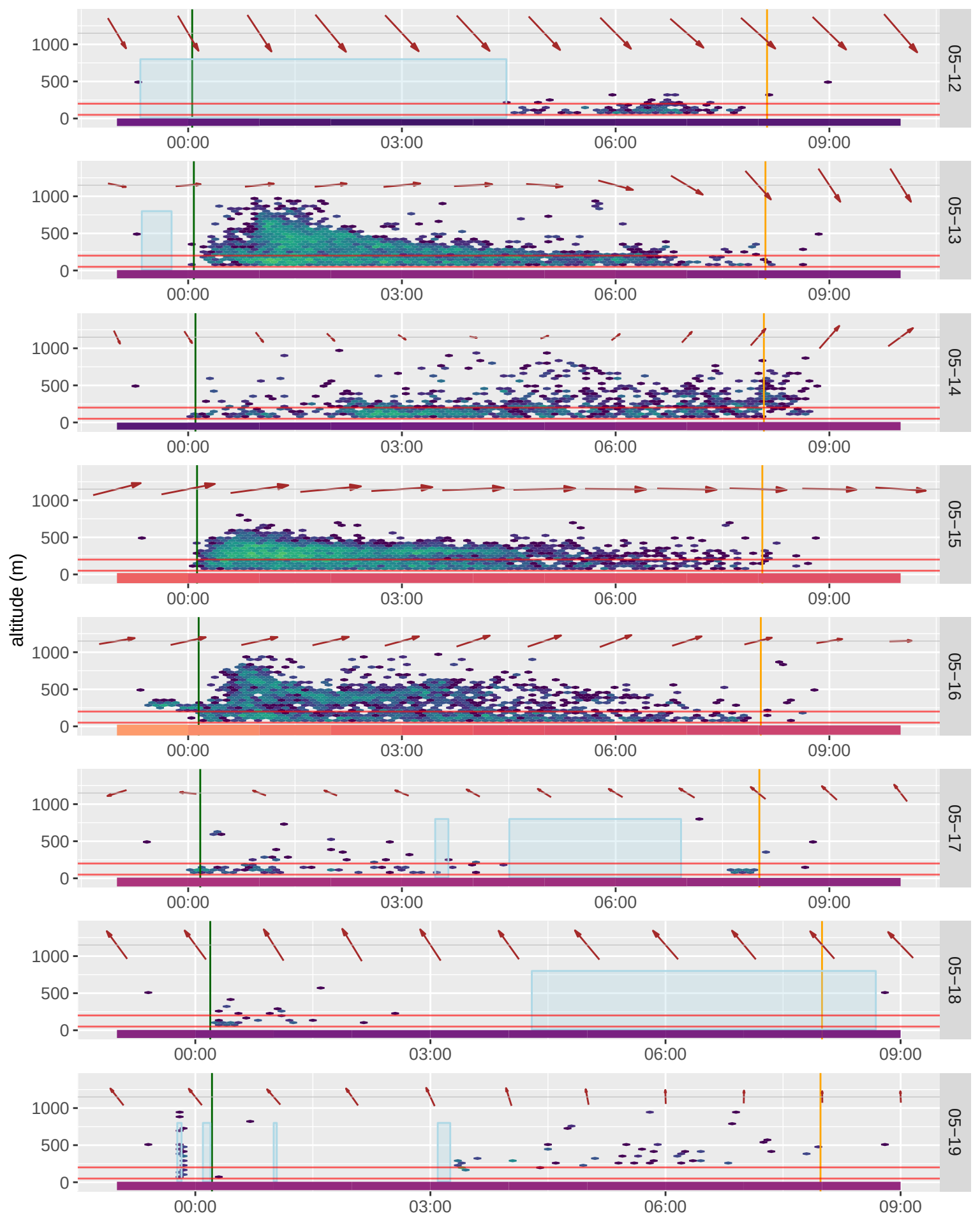
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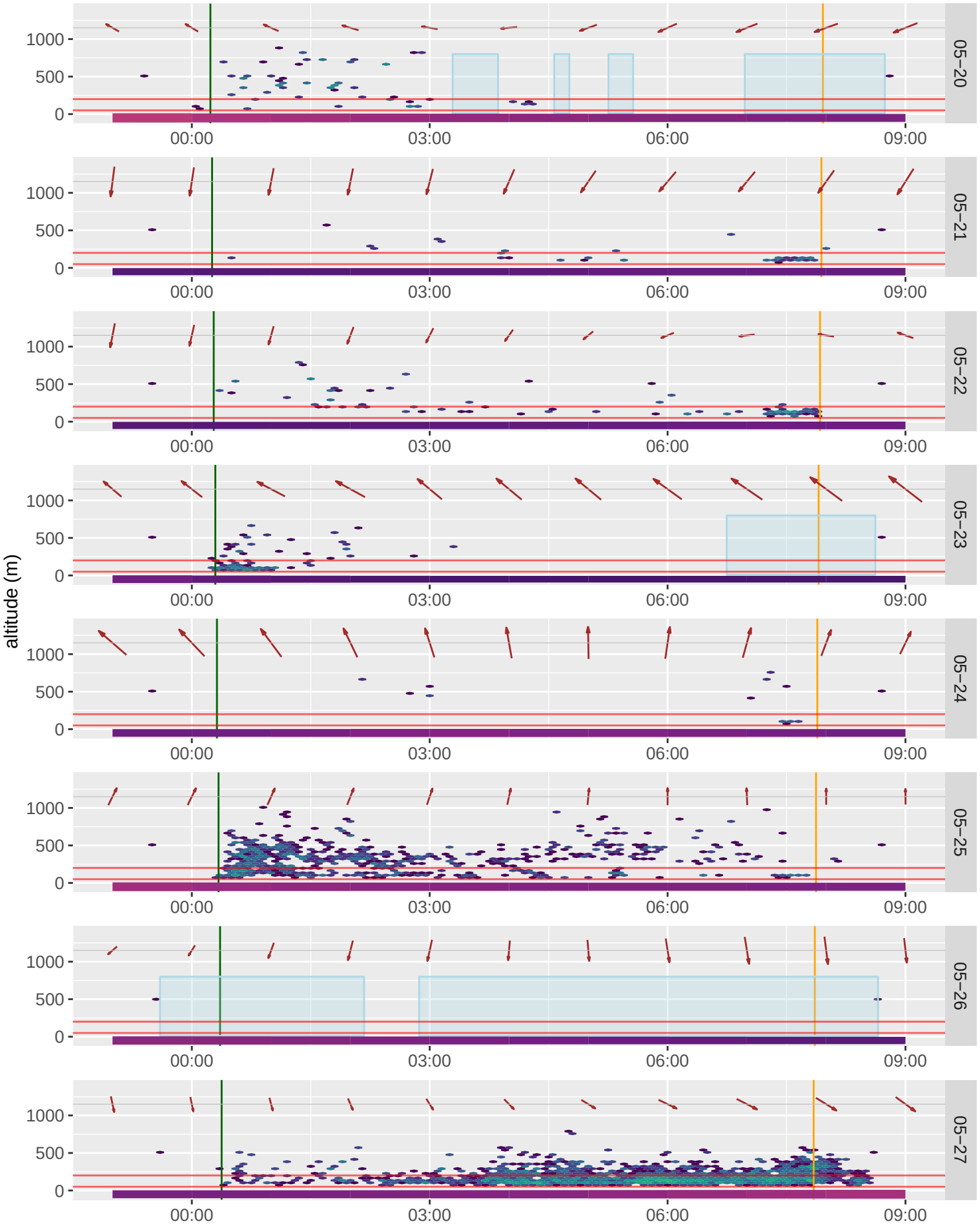
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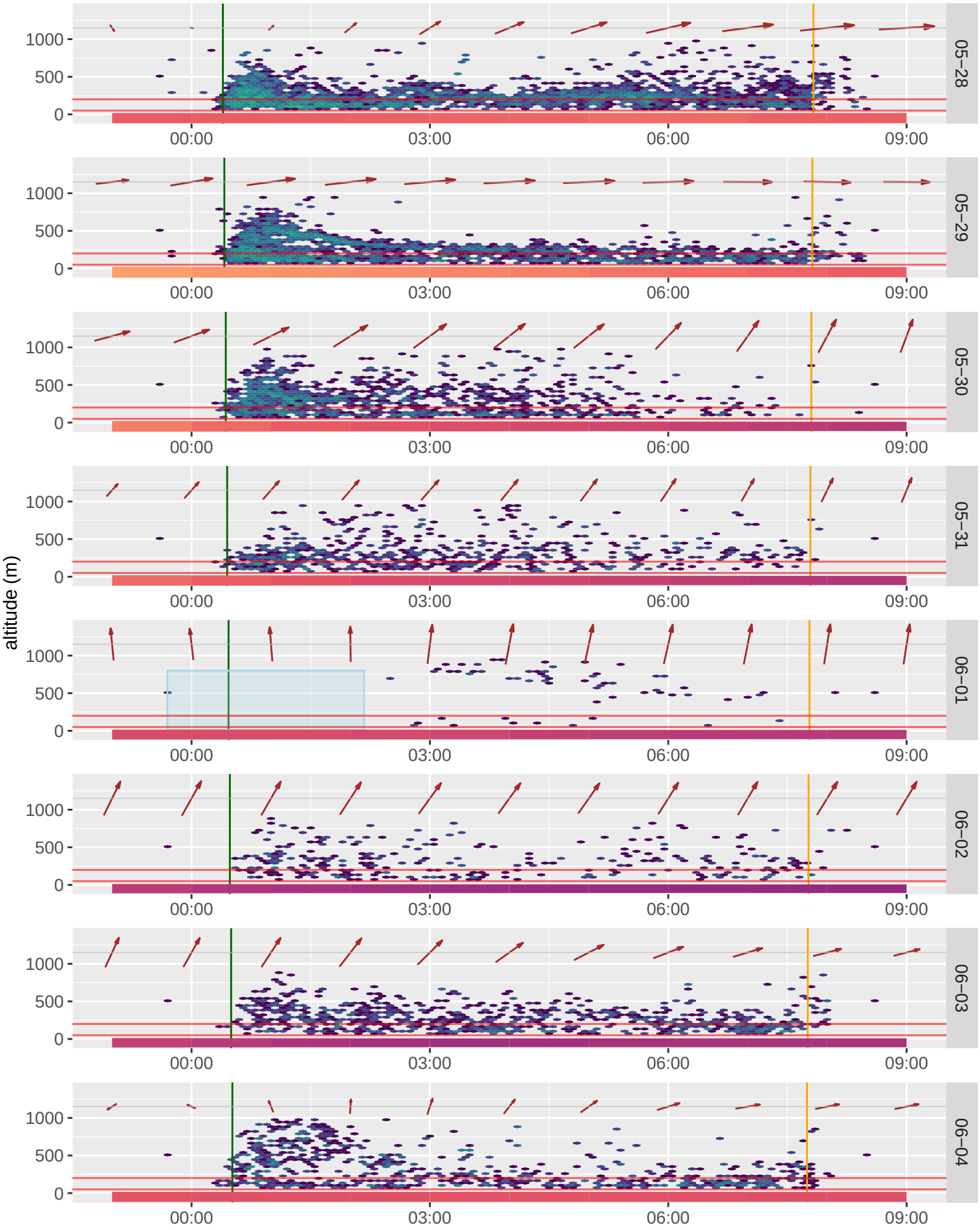
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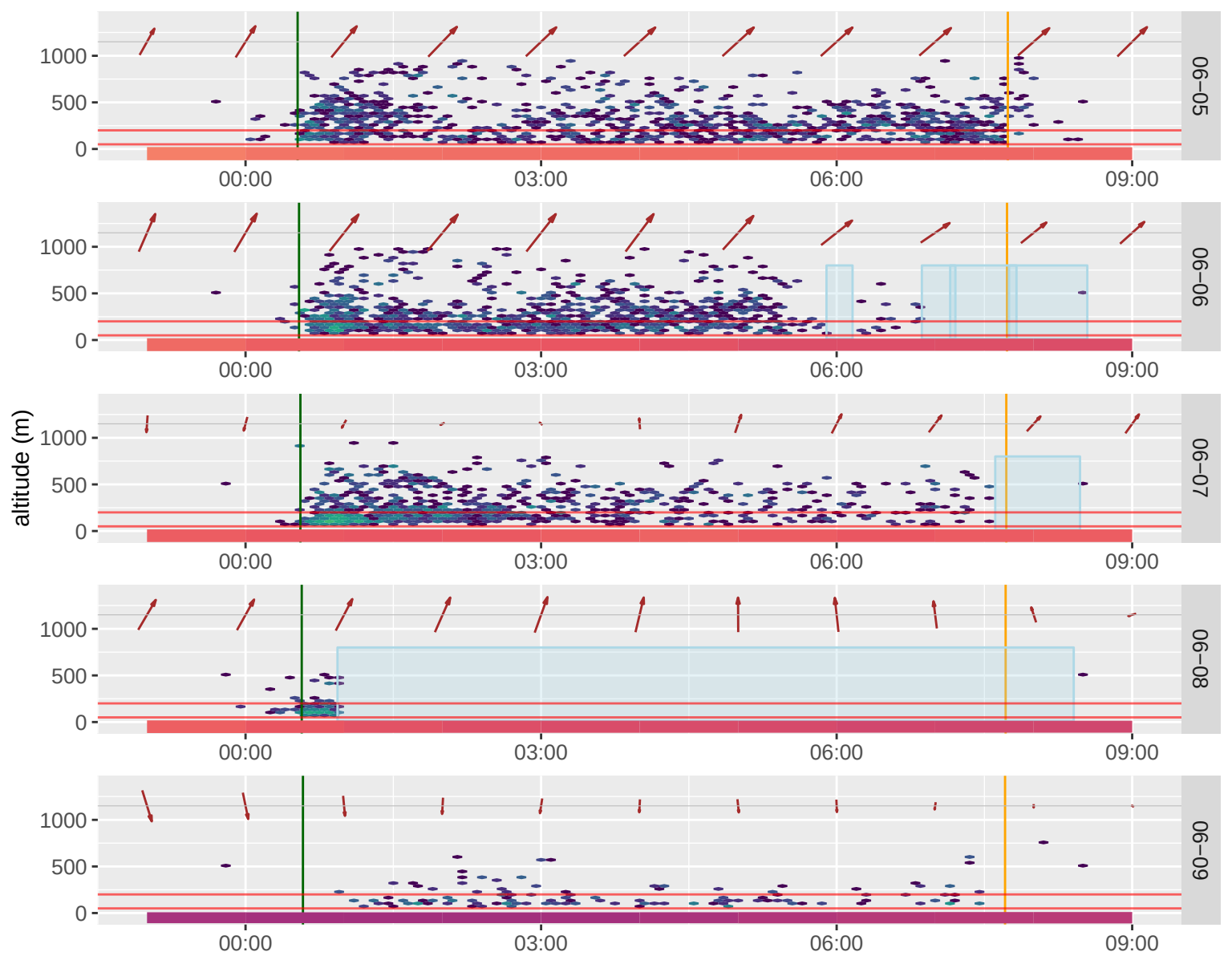
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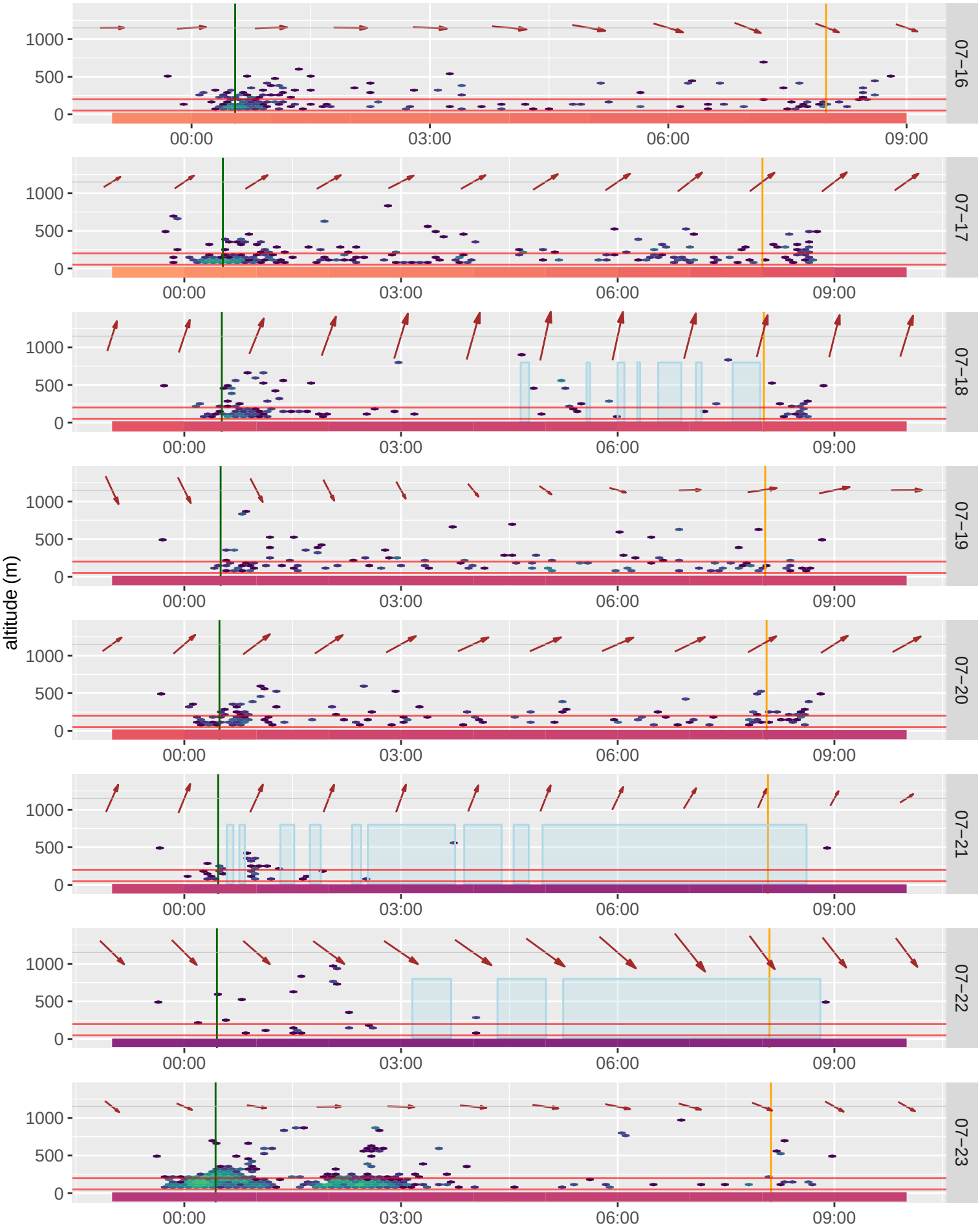
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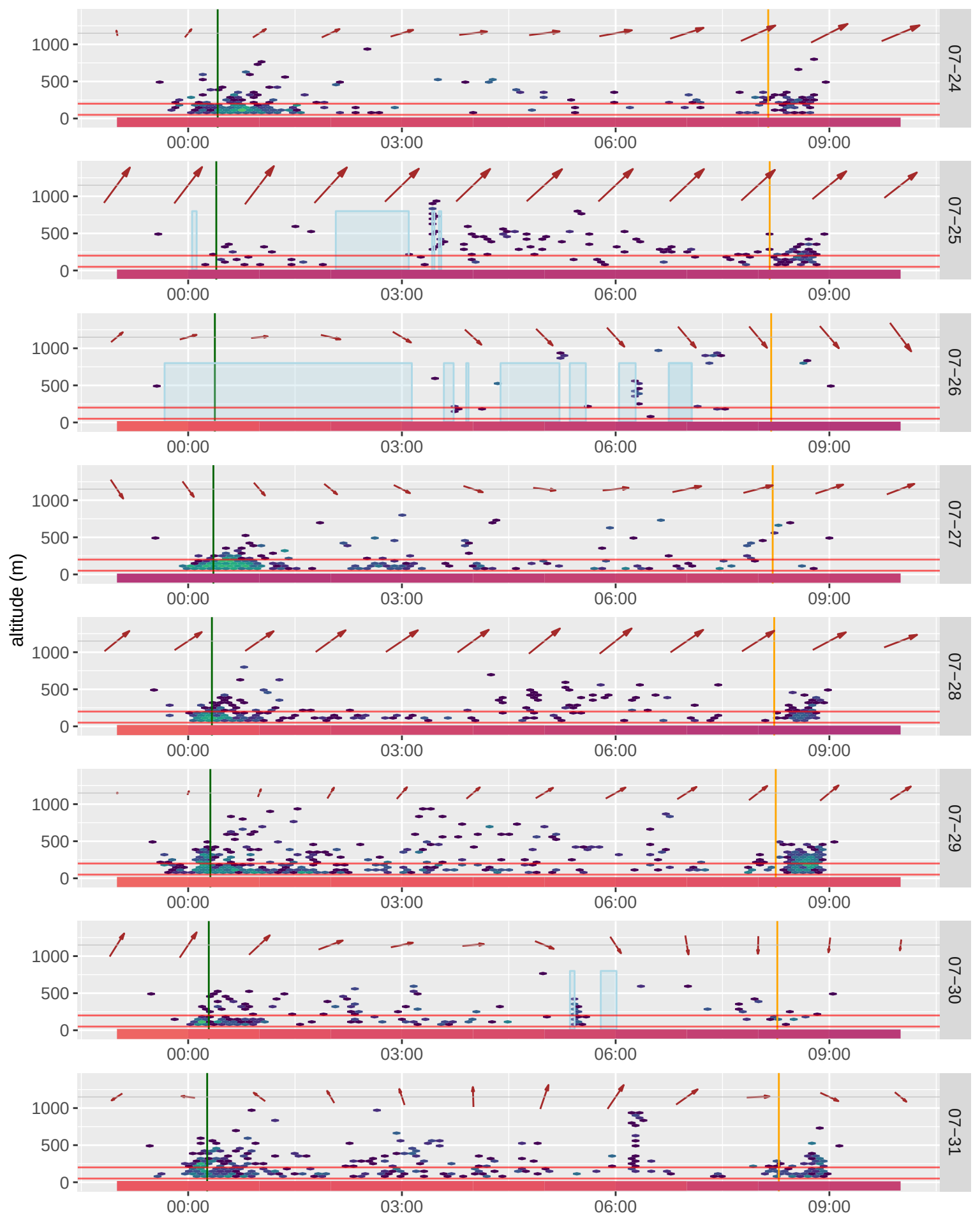
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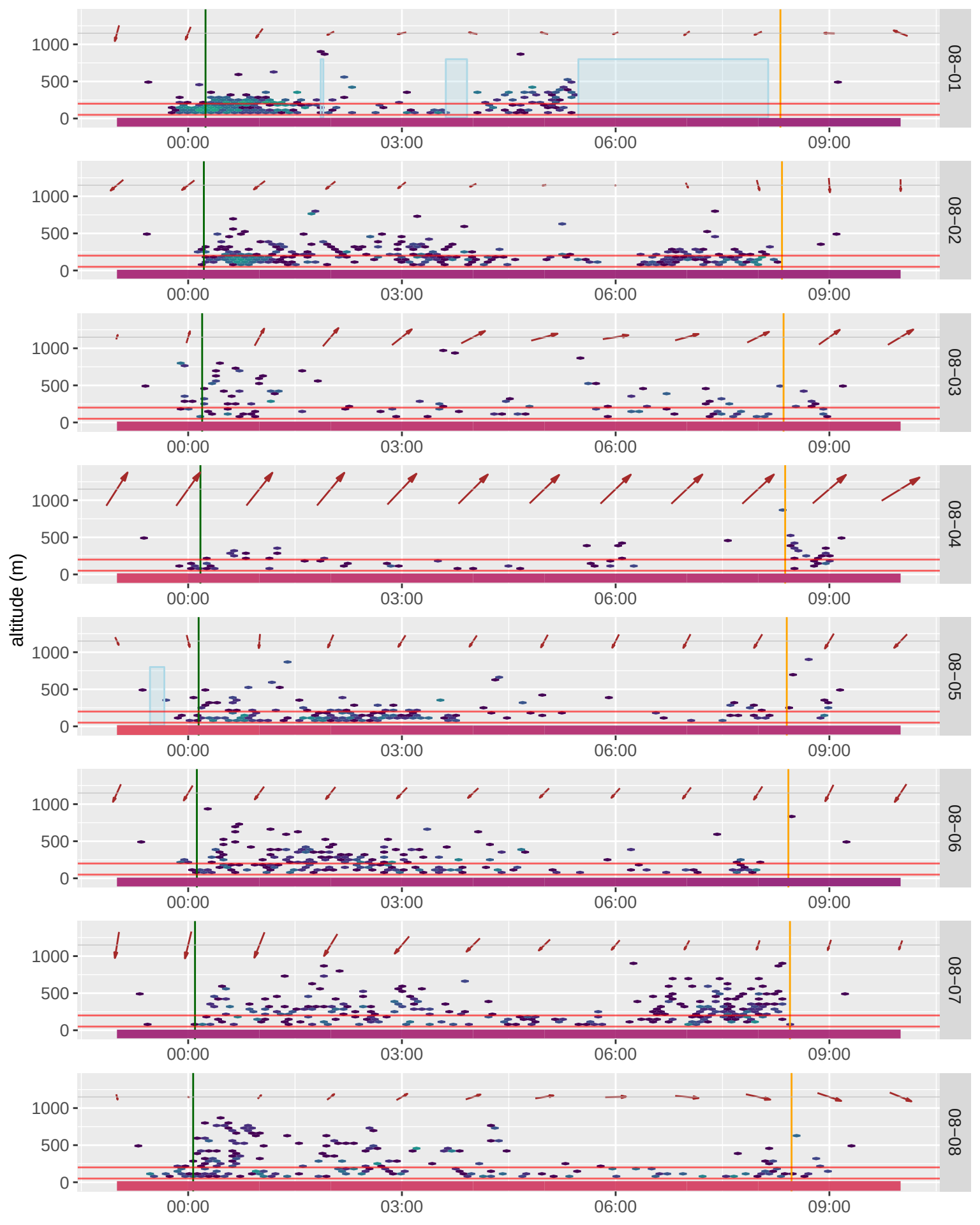
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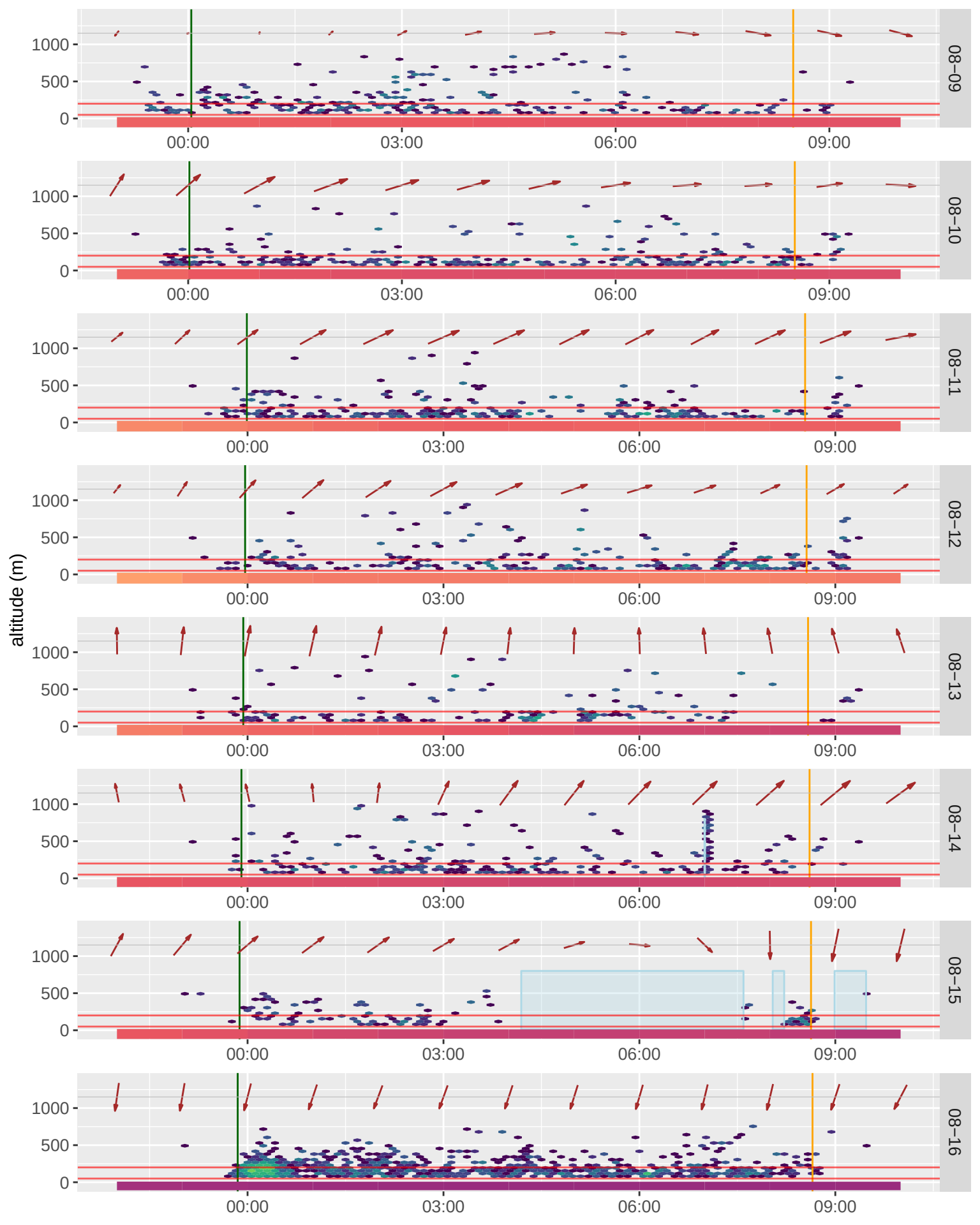
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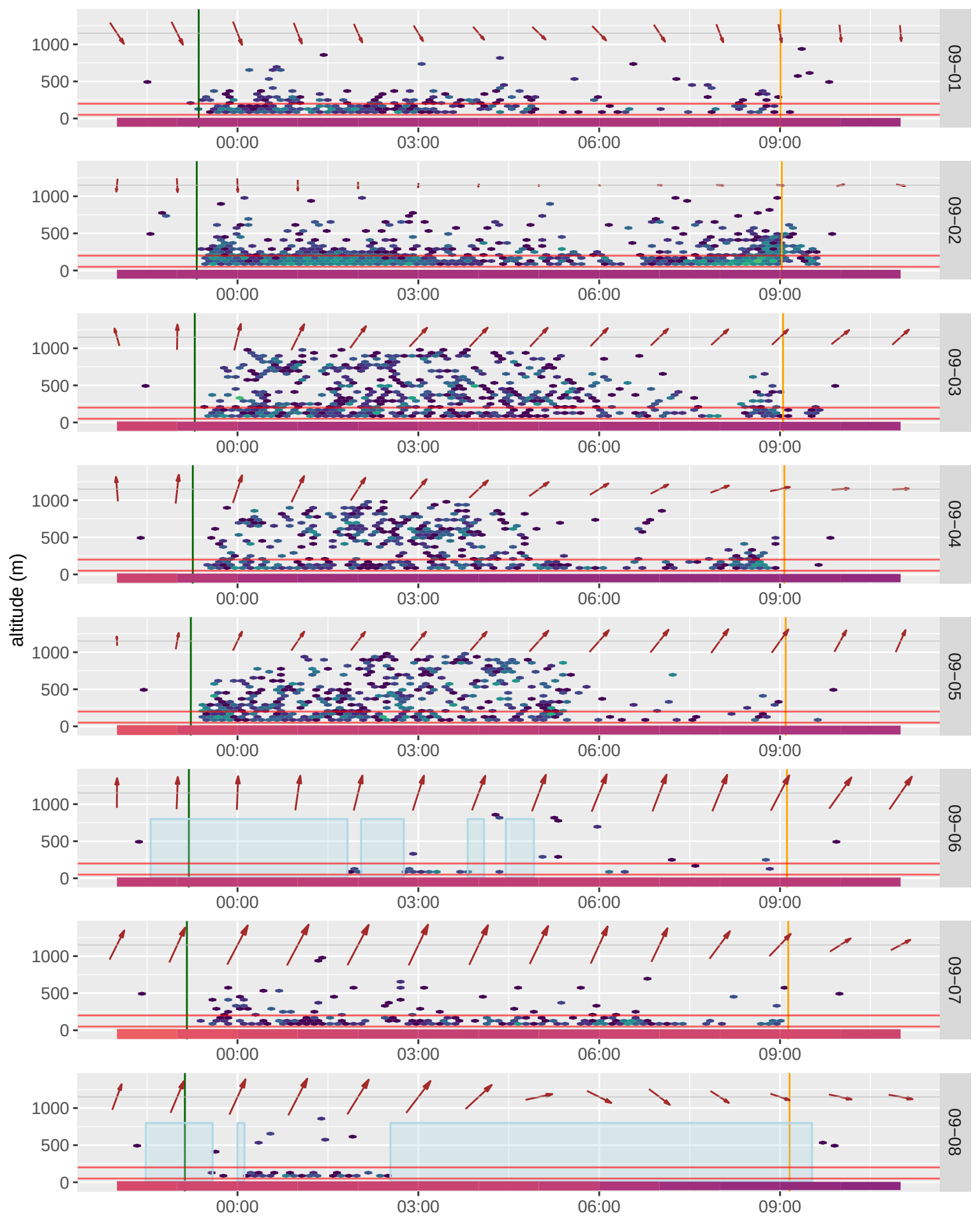
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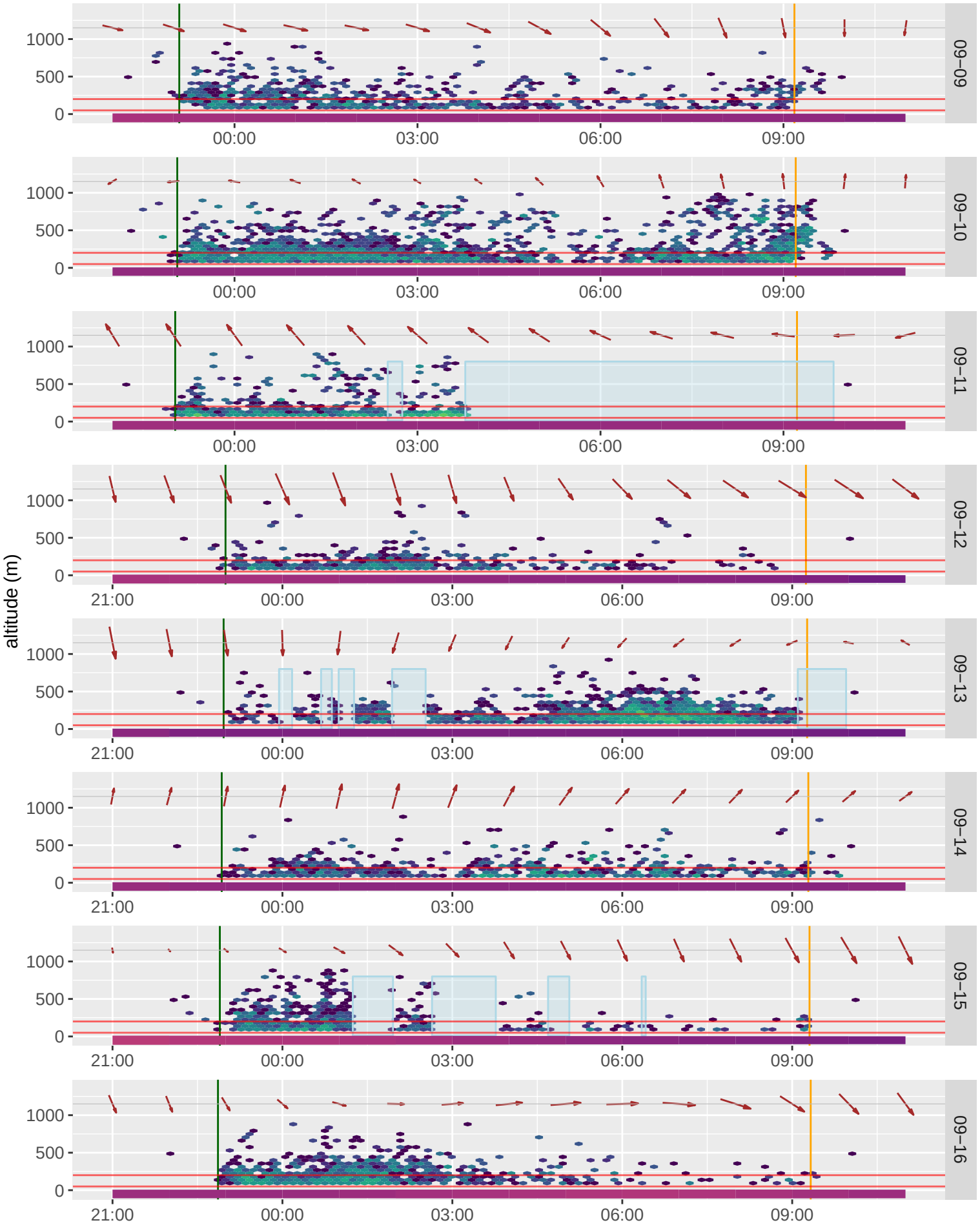
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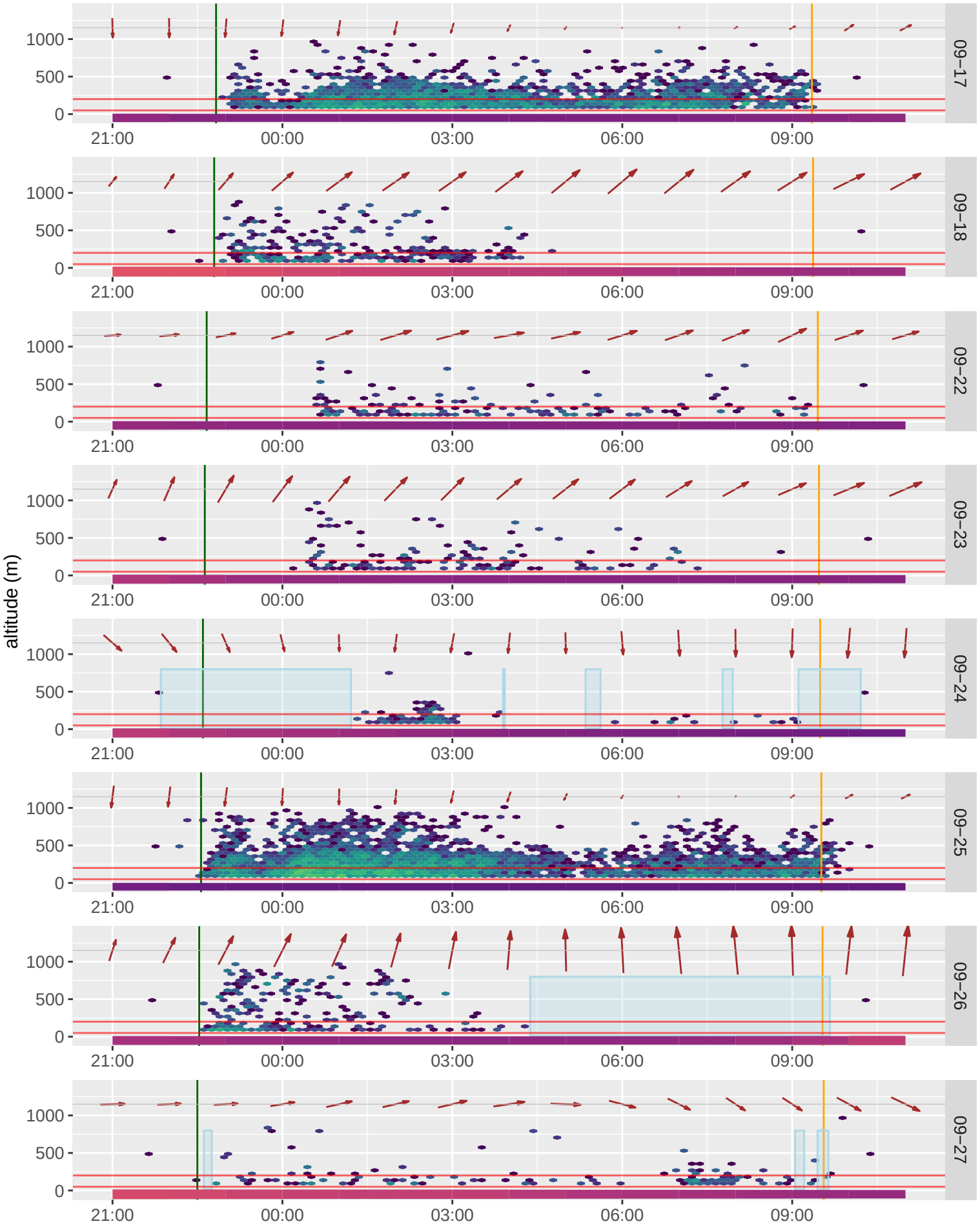
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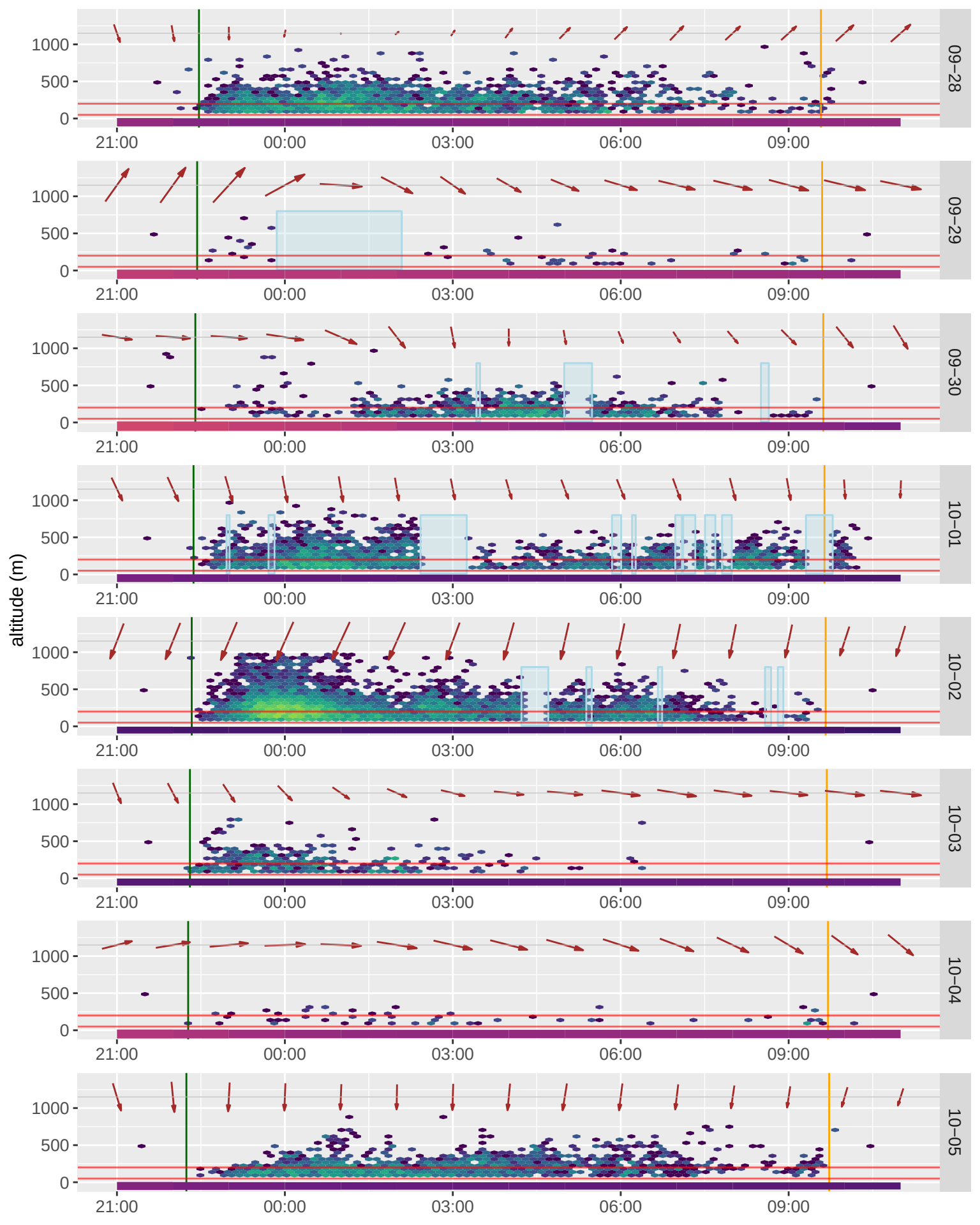
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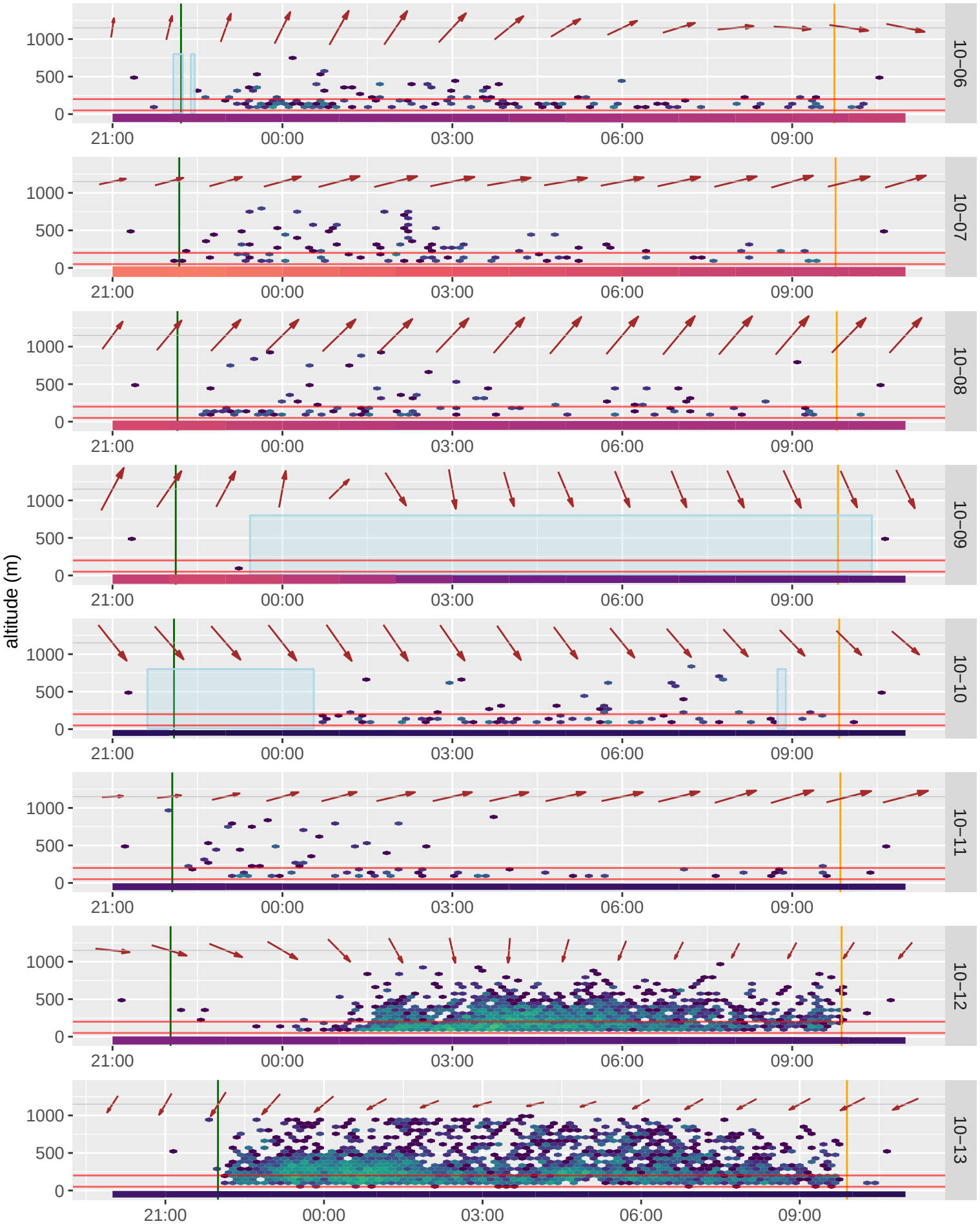
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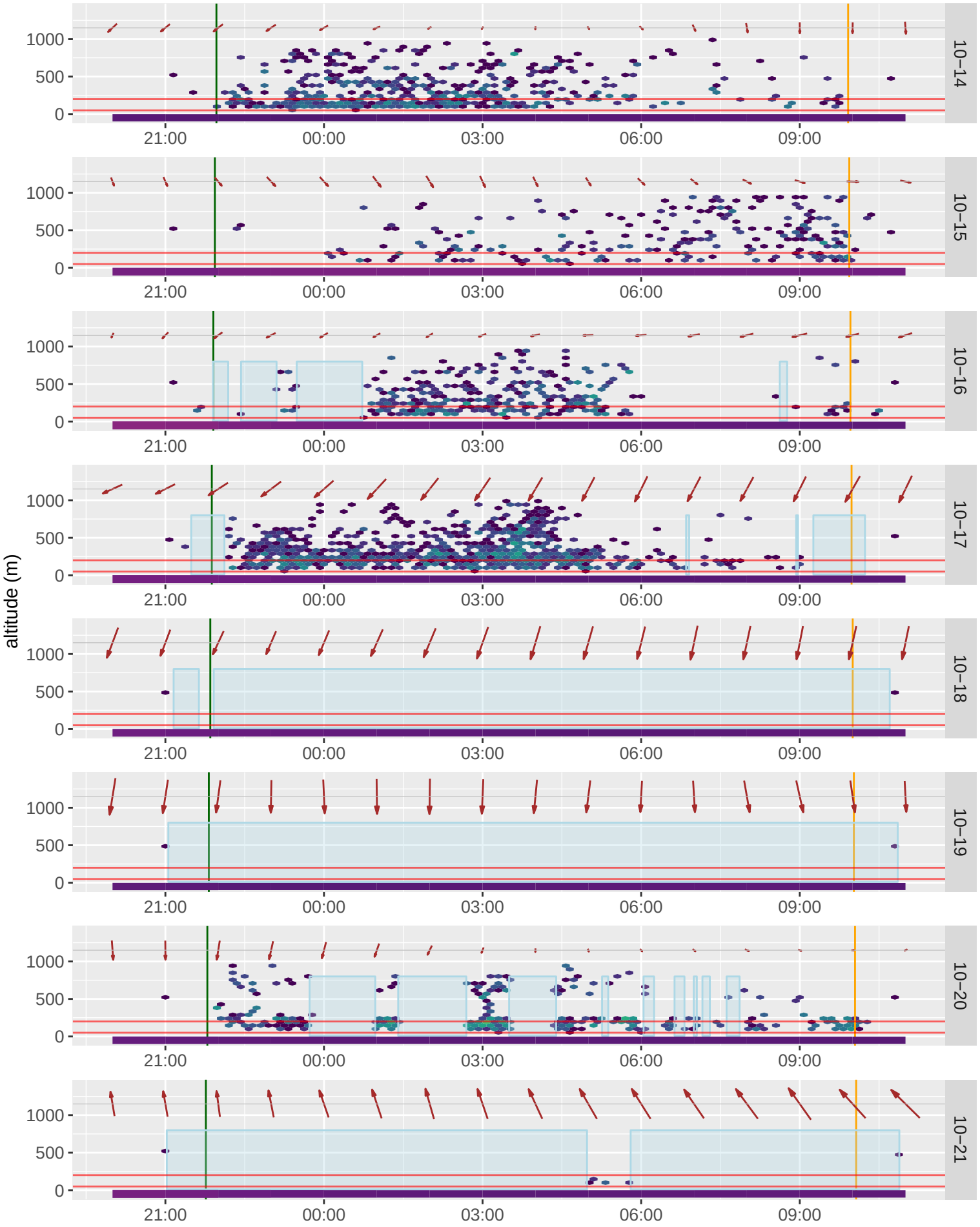
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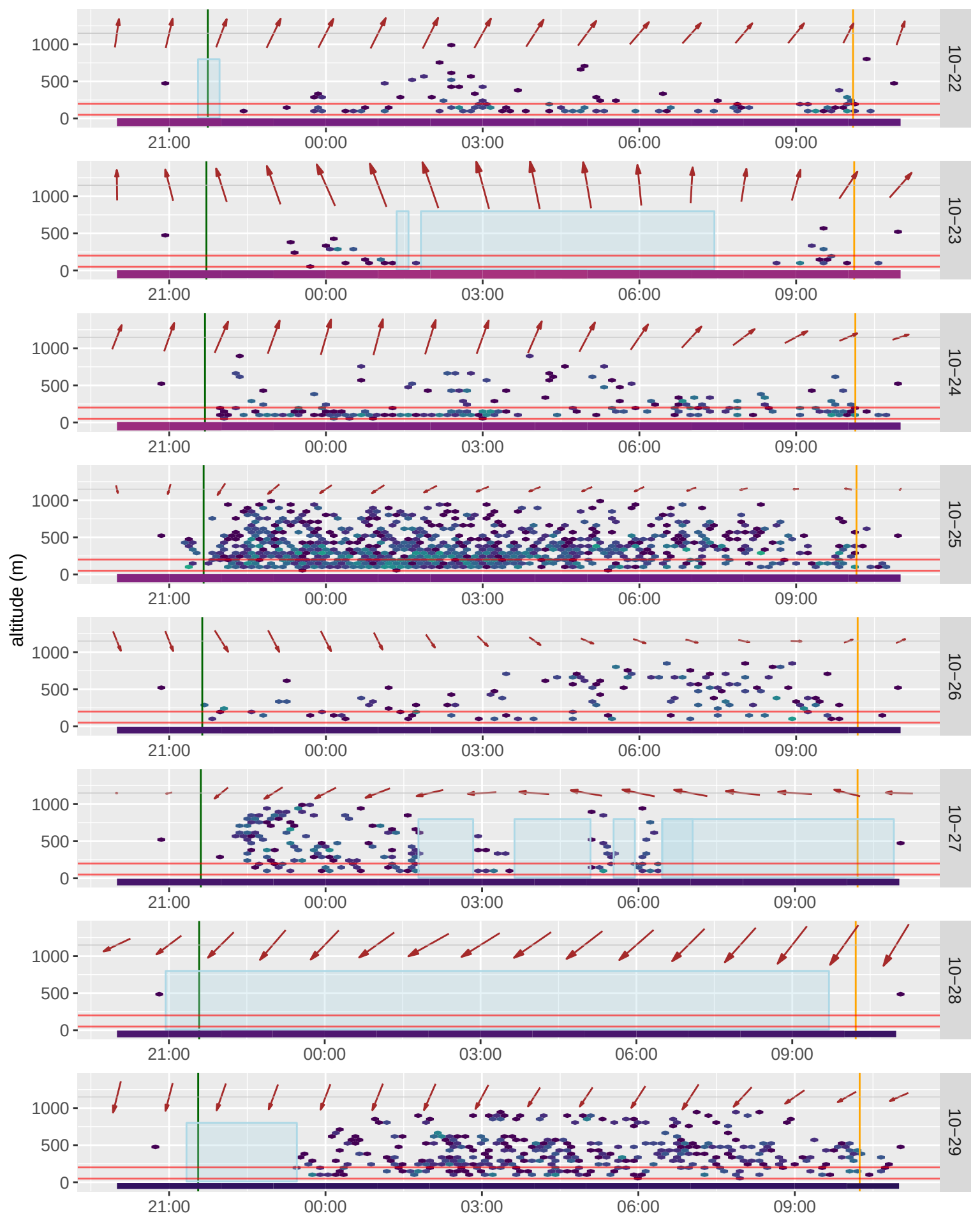
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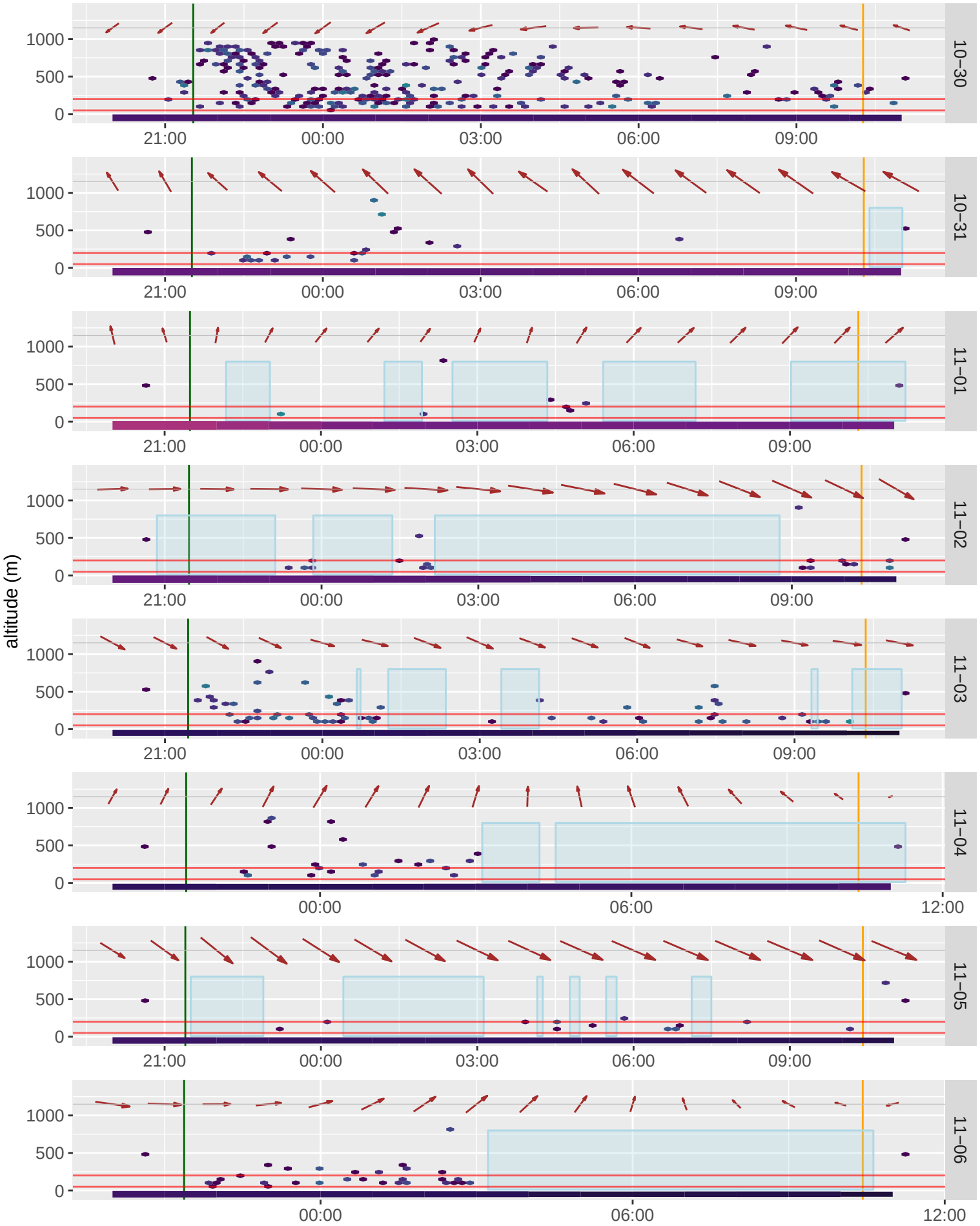
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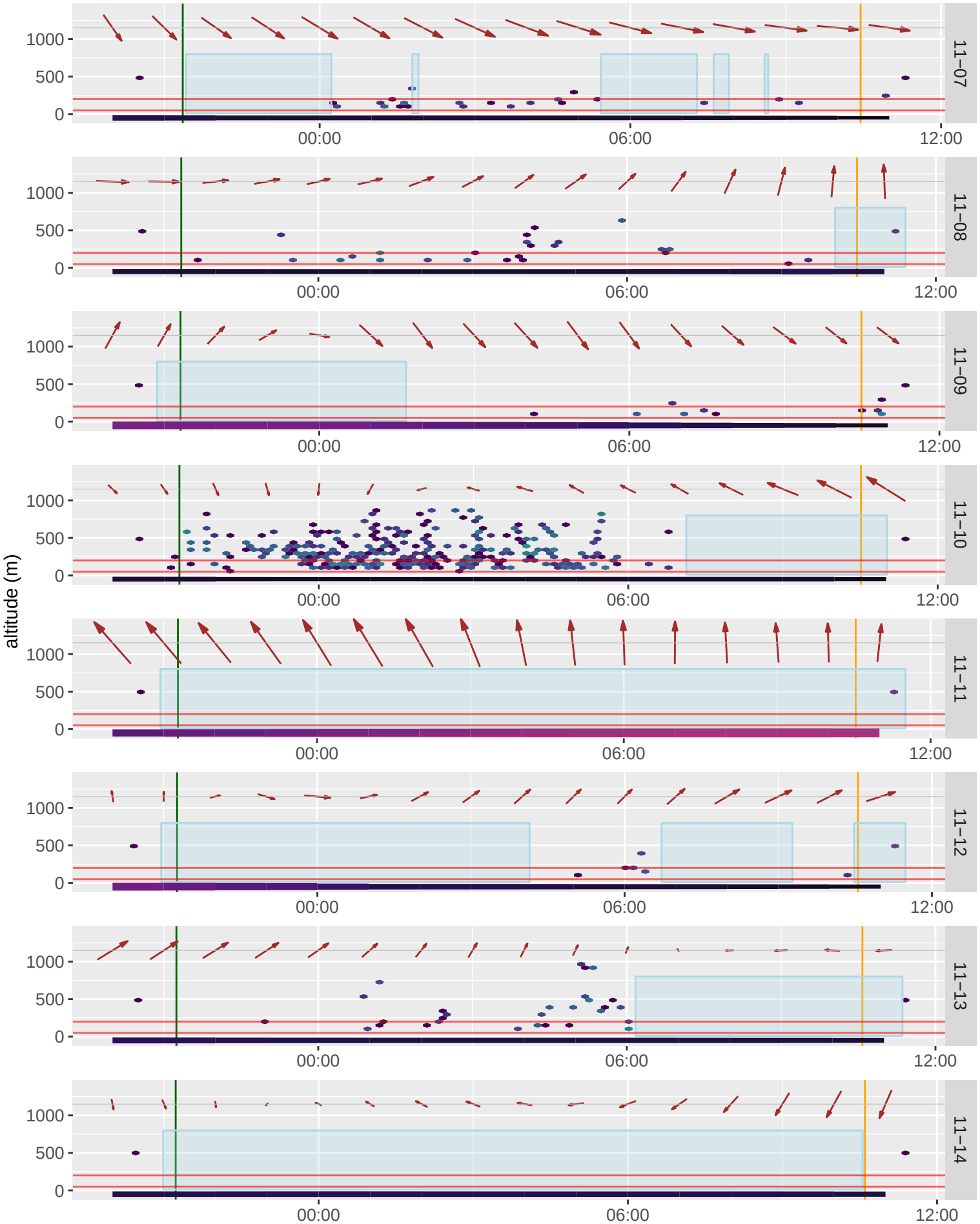
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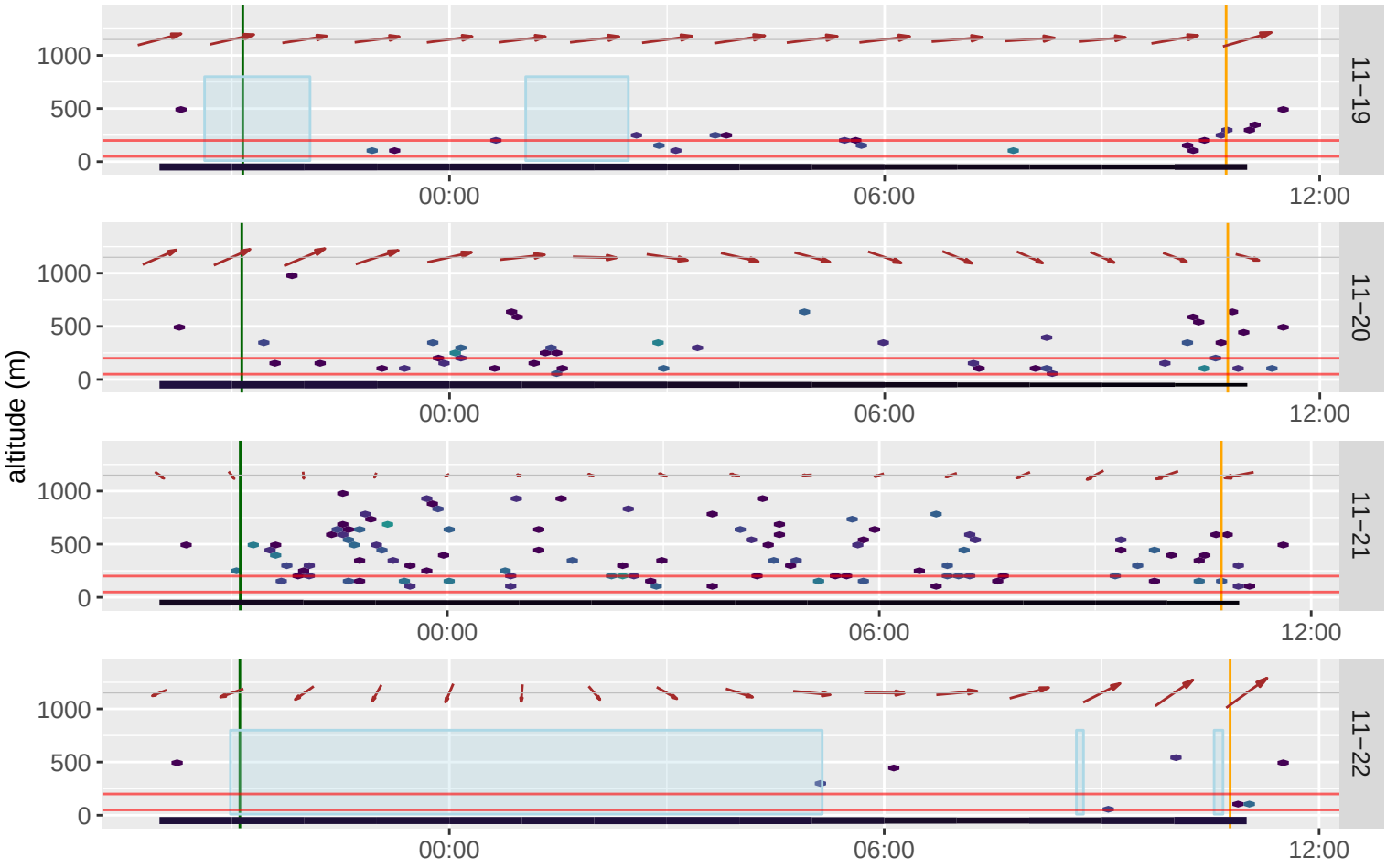
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Table J1: eBird Summary

Functional Group	Scientific Name	Common Name	NSESA	SARA	COSEWIC	AC CDC	# of eBird Records	Confirmed within LAA
Passerines	*Empidonax alnorum*	Alder Flycatcher				S5B	65	Yes
Waterfowl	*Anas rubripes*	American Black Duck				S5B,S5N	2	Yes
Passerines	*Corvus brachyrhynchos*	American Crow				S5	49	Yes
Passerines	*Spinus tristis*	American Goldfinch				S5	212	Yes
Passerines	*Setophaga ruticilla*	American Redstart				S5B	28	Yes
Passerines	*Turdus migratorius*	American Robin				S5B,S3N	156	Yes
Shorebirds	*Scolopax minor*	American Woodcock				S5B	10	Yes
Diurnal Raptors	*Haliaeetus leucocephalus*	Bald Eagle		NAR		S5	25	Yes
Nocturnal Raptors	*Strix varia*	Barred Owl				S5	3	Yes
Passerines	*Setophaga castanea*	Bay-breasted Warbler				S3S4B,S4S5M	5	Yes
Waterbirds	*Megaceryle alcyon*	Belted Kingfisher				S4S5B	21	Yes
Passerines	*Mniotilta varia*	Black-and-white Warbler				S5B	77	Yes
Other Landbirds	*Picoides arcticus*	Black-backed Woodpecker				S3S4	1	No
Passerines	*Setophaga fusca*	Blackburnian Warbler				S4B,S5M	12	Yes
Passerines	*Poecile atricapillus*	Black-capped Chickadee				S5	149	Yes
Passerines	*Setophaga caerulescens*	Black-throated Blue Warbler				S5B	4	Yes
Passerines	*Setophaga virens*	Black-throated Green Warbler				S5B	100	Yes
Passerines	*Cyanocitta cristata*	Blue Jay				S5	118	Yes
Passerines	*Vireo solitarius*	Blue-headed Vireo				S5B	54	Yes
Passerines	*Dolichonyx oryzivorus*	Bobolink	Vulnerable	T	SC	S3B	1	Yes
Passerines	*Poecile hudsonicus*	Boreal Chickadee				S3	11	Yes
Passerines	*Certhia americana*	Brown Creeper				S5	11	Yes
Passerines	*Perisoreus canadensis*	Canada Jay				S3	2	Yes
Passerines	*Cardellina canadensis*	Canada Warbler	Endangered	T	SC	S3B	4	Yes
Passerines	*Setophaga tigrina*	Cape May Warbler				S3B,SUM	3	Yes
Passerines	*Bombycilla cedrorum*	Cedar Waxwing				S5B	106	Yes
Passerines	*Setophaga pensylvanica*	Chestnut-sided Warbler				S5B	10	Yes
Other Landbirds	*Chaetura pelagica*	Chimney Swift	Endangered			S2S3B,S1M	X	No
Waterfowl	*Bucephala clangula*	Common Goldeneye				S4B,S4N,S5M	6	No
Passerines	*Quiscalus quiscula*	Common Grackle				S5B	37	Yes
Waterfowl	*Mergus merganser*	Common Merganser				S5B,S4N	1	No
Nightjars	*Chordeiles minor*	Common Nighthawk	Threatened	T	SC	S3B	8	Yes
Passerines	*Corvus corax*	Common Raven				S5	101	Yes
Passerines	*Acanthis flammea*	Redpoll	0	0		S5N	1	No
Passerines	*Geothlypis trichas*	Common Yellowthroat				S5B	73	Yes
Passerines	*Junco hyemalis*	Dark-eyed Junco				S4S5	97	Yes
Diurnal Raptors		diurnal raptor sp.					7	Yes
Waterbirds	*Nannopterum auritum*	Double-crested Cormorant		NAR		S5B	2	No
Other Landbirds	*Dryobates pubescens*	Downy Woodpecker				S5	13	Yes

Table J1: eBird Summary

Functional Group	Scientific Name	Common Name	NSESA	SARA	COSEWIC	AC CDC	# of eBird Records	Confirmed within LAA
Waterfowl		Duck sp.					3	Yes
Passerines	*Sayornis phoebe*	Eastern Phoebe				S4S5B,S4M	6	Yes
Passerines	*Contopus virens*	Eastern Wood-Pewee	Vulnerable	SC	SC	S3S4B	8	Yes
Passerines	*Sturnus vulgaris*	European Starling				SNA	14	Yes
Passerines	*Coccothraustes vespertinus*	Evening Grosbeak	Vulnerable	SC	SC	S3B,S3N,S3M	87	Yes
Passerines		Finch sp.					10	Yes
Passerines	*Regulus satrapa*	Golden-crowned Kinglet				S5	51	Yes
Shorebirds	*Larus marinus*	Great Black-backed Gull				S4S5	X	No
Other Landbirds		Grouse sp.					2	Yes
Other Landbirds	*Dryobates villosus*	Hairy Woodpecker				S5	24	Yes
Passerines	*Catharus guttatus*	Hermit Thrush				S5B	47	Yes
Shorebirds	*Larus argentatus*	Herring Gull				S5	4	Yes
Waterfowl	*Lophodytes cucullatus*	Hooded Merganser				S4S5B,S5M	3	No
Shorebirds	*Charadrius vociferus*	Killdeer				S3B	3	Yes
Passerines	*Empidonax minimus*	Least Flycatcher				S4S5B,S5M	46	Yes
Passerines	*Melospiza lincolnii*	Lincoln's Sparrow				S4B,S5M	12	Yes
Passerines	*Setophaga magnolia*	Magnolia Warbler				S5B	91	Yes
Diurnal Raptors	*Falco columbarius*	Merlin		NAR		S5B	2	Yes
Passerines	*Zenaida macroura*	Mourning Dove				S5	106	Yes
Passerines	*Geothlypis philadelphia*	Mourning Warbler				S4B,S5M	34	Yes
Other Landbirds	*Colaptes auratus*	Northern Flicker				S5B	47	Yes
Diurnal Raptors	*Accipiter atricapillus*	American Goshawk	0	0		S3S4	4	No
Diurnal Raptors	*Circus hudsonius*	Northern Harrier		NAR		S4B,S4S5M	1	Yes
Passerines	*Setophaga americana*	Northern Parula				S5B	42	Yes
Passerines	*Parkesia noveboracensis*	Northern Waterthrush				S4B,S5M	11	Yes
Passerines	*Setophaga petechia*	Yellow Warbler	0	0		S5B	5	Yes
Passerines	*Contopus cooperi*	Olive-sided Flycatcher	Threatened	T	SC	S3B	23	Yes
Passerines	*Seiurus aurocapilla*	Ovenbird				S5B	125	Yes
Passerines	*Setophaga palmarum*	Palm Warbler				S5B	1	Yes
Other Landbirds	*Dryocopus pileatus*	Pileated Woodpecker				S5	10	Yes
Passerines	*Pinicola enucleator*	Pine Grosbeak				S3B,S5N,S5M	7	No
Passerines	*Spinus pinus*	Pine Siskin				S3	35	Yes
Passerines	*Haemorhous purpureus*	Purple Finch				S4S5B,S3S4N,S5M	96	Yes
Passerines	*Sitta canadensis*	Red-breasted Nuthatch				S4S5	33	Yes
Passerines	*Vireo olivaceus*	Red-eyed Vireo				S5B	88	Yes
Diurnal Raptors	*Buteo jamaicensis*	Red-tailed Hawk		NAR		S5	4	Yes
Passerines	*Agelaius phoeniceus*	Red-winged Blackbird				S4B	8	Yes
Waterfowl	*Aythya collaris*	Ring-necked Duck				S5B	11	Yes
Other Landbirds	*Columba livia*	Rock Pigeon				SNA	X	Yes

Table J1: eBird Summary

Functional Group	Scientific Name	Common Name	NSESA	SARA	COSEWIC	AC CDC	# of eBird Records	Confirmed within LAA
Passerines	*Pheucticus ludovicianus*	Rose-breasted Grosbeak				S3B	11	No
Passerines	*Corthylio calendula*	Ruby-crowned Kinglet				S4B,S5M	48	Yes
Other Landbirds	*Archilochus colubris*	Ruby-throated Hummingbird				S5B	21	Yes
Other Landbirds	*Bonasa umbellus*	Ruffed Grouse				S5	19	Yes
Passerines	*Euphagus carolinus*	Rusty Blackbird	Endangered	SC	SC	S2B	X	No
Passerines	*Passerculus sandwichensis*	Savannah Sparrow				S4S5B,S5M	5	Yes
Diurnal Raptors	*Accipiter striatus*	Sharp-shinned Hawk		NAR		S5	1	No
Passerines	*Melospiza melodia*	Song Sparrow				S5B	45	Yes
Other Landbirds	*Canachites canadensis*	Spruce Grouse				S4	1	No
Passerines	*Catharus ustulatus*	Swainson's Thrush				S4B,S5M	65	Yes
Passerines	*Melospiza georgiana*	Swamp Sparrow				S5B	12	Yes
Passerines	*Tachycineta bicolor*	Tree Swallow				S4B	6	Yes
Passerines	*Catharus fuscescens*	Veery				S4B	1	Yes
Passerines		Warbler sp. (Parulidae sp.)					2	Yes
Passerines	*Piranga ludoviciana*	Western Tanager				SNA	4	No
Passerines	*Sitta carolinensis*	White-breasted Nuthatch				S4	3	Yes
Passerines	*Zonotrichia leucophrys*	White-crowned Sparrow				SUM	1	No
Passerines	*Zonotrichia albicollis*	White-throated Sparrow				S4S5B,S5M	110	Yes
Passerines	*Loxia leucoptera*	White-winged Crossbill				S4S5	7	Yes
Passerines	*Troglodytes hiemalis*	Winter Wren				S5B	11	Yes
Waterfowl	*Aix sponsa*	Wood Duck				S5B	4	No
Other Landbirds		Woodpecker sp.					3	Yes
Passerines	*Empidonax flaviventris*	Yellow-bellied Flycatcher				S4B,S5M	11	Yes
Other Landbirds	*Sphyrapicus varius*	Yellow-bellied Sapsucker				S5B	15	Yes
Passerines	*Setophaga coronata*	Yellow-rumped Warbler				S5B	34	Yes

Table J2: Eigg Mountain Data Summary for All Bird Programs

Functional Group	Scientific Name	Common Name	Status				Number of Observations Recorded during 2025 Field Programs								
									Spring Migration		Fall Migration				
			COSEWIC	SARA	NSESA	AC CDC	Winter Residency	Nocturnal Owls	Point Counts	Passage Migration	Point Counts	Passage Migration	Breeding Birds	Nightjars	Total
Passerines	*Empidonax alnorum*	Alder Flycatcher				S5B			7	3			22	1	33
Waterfowl	*Anas rubripes*	American Black Duck				S5B,S5N					6				6
Passerines	*Corvus brachyrhynchos*	American Crow				S5	4		23	1	58	4	8	1	99
Passerines	*Spinus tristis*	American Goldfinch				S5	24		33	12	31	11	8		119
Diurnal Raptors	*Falco sparverius*	American Kestrel				S3B,S4S5M				2					2
Passerines	*Setophaga ruticilla*	American Redstart				S5B			14	4	2		45	2	67
Passerines	*Turdus migratorius*	American Robin				S5B,S3N			69	7	19	3	42	6	146
Shorebirds	*Scolopax minor*	American Woodcock				S5B					2				2
Diurnal Raptors	*Haliaeetus leucocephalus*	Bald Eagle	NAR			S5			1	3	5	1	2		12
Nocturnal Raptors	*Strix varia*	Barred Owl				S5		3			1			1	5
Passerines	*Setophaga castanea*	Bay-breasted Warbler				S3S4B,S4S5M					1		7		8
Waterbirds	*Megaceryle alcyon*	Belted Kingfisher				S4S5B				1			1		2
Passerines	*Mniotilta varia*	Black-and-White Warbler				S5B			26	2			29	5	62
Passerines	*Setophaga fusca*	Blackburnian Warbler				S4B,S5M							1	1	2
Passerines	*Poecile atricapillus*	Black-capped Chickadee				S5	51		41	10	89	19	23		233
Passerines	*Setophaga caerulescens*	Black-throated Blue Warbler				S5B			3				1		4
Passerines	*Setophaga virens*	Black-throated Green Warbler				S5B			38	2		1	66	5	112
Passerines	*Cyanocitta cristata*	Blue Jay				S5	4		15	4	59	15	18	2	117
Passerines	*Vireo solitarius*	Blue-headed Vireo				S5B			23	1	5		25		54
Passerines	*Dolichonyx oryzivorus*	Bobolink	SC	T	Vulnerable	S3B			1						1
Passerines	*Poecile hudsonicus*	Boreal Chickadee				S3	3		3	1	6	1	1		15
Passerines	*Bombycilla garrulus*	Bohemian Waxwing				S4N					30				30
Diurnal Raptors	*Buteo platypterus*	Broad-winged Hawk				S5B	1								1
Passerines	*Certhia americana*	Brown Creeper				S5			1		4				5
Waterfowl	*Branta canadensis*	Canada Goose				SUB,S4N,S5M					58	13			71
Passerines	*Perisoreus canadensis*	Canada Jay				S3	3		2		6	7	2		20
Passerines	*Cardellina canadensis*	Canada Warbler	SC	T	Endangered	S3B							2		2
Passerines	*Setophaga tigrina*	Cape May Warbler				S3B,SUM			1		1		3		5
Passerines	*Bombycilla cedrorum*	Cedar Waxwing				S5B			9	4	23	18	38		92
Passerines	*Setophaga pensylvanica*	Chestnut-sided Warbler				S5B			6	1	2		16		25
Passerines	*Spizella passerina*	Chipping Sparrow				S4B,S5M			5		2	1	1		9
Passerines	*Quiscalus quiscula*	Common Grackle				S5B			9		6		4	2	21
Waterbirds	*Gavia immer*	Common Loon	NAR			S4B								2	2
Nightjars	*Chordeiles minor*	Common Nighthawk	SC	T	Threatened	S3B								1	1
Passerines	*Corvus corax*	Common Raven				S5	9		25	11	14	17	7	1	84
Passerines	*Geothlypis trichas*	Common Yellowthroat				S5B			10	7	9	1	23		50
Diurnal Raptors	*Accipiter cooperii*	Cooper's Hawk	NAR			S1?B,SUN,SUM	1				1				2
Passerines	*Junco hyemalis*	Dark-eyed Junco				S4S5			43	7	87	19	19	1	176
Other Landbirds	*Dryobates pubescens*	Downy Woodpecker				S5	3		15	1	5		5		29
Passerines	*Tyrannus tyrannus*	Eastern Kingbird				S3B							1		1
Passerines	*Sayornis phoebe*	Eastern Phoebe				S4S5B,S4M							2		2
Passerines	*Contopus virens*	Eastern Wood-Pewee	SC	SC	Vulnerable	S3S4B							1		1
Passerines	*Sturnus vulgaris*	European Starling				SNA					39		10		49
Passerines	*Coccothraustes vespertinus*	Evening Grosbeak	SC	SC	Vulnerable	S3B,S3N,S3M			7		1				8
Passerines		Finch sp							1						1
Passerines	*Regulus satrapa*	Golden-crowned Kinglet				S5	25		17	4	61	12	18	4	141
Passerines	*Dumetella carolinensis*	Gray Catbird				S4B			4				7		11

Table J2: Eigg Mountain Data Summary for All Bird Programs

Functional Group	Scientific Name	Common Name	Status				Number of Observations Recorded during 2025 Field Programs								
									Spring Migration		Fall Migration				
			COSEWIC	SARA	NSESA	AC CDC	Winter Residency	Nocturnal Owls	Point Counts	Passage Migration	Point Counts	Passage Migration	Breeding Birds	Nightjars	Total
Other Landbirds	*Dryobates villosus*	Hairy Woodpecker				S5	4		5		3	2	7		21
Passerines	*Catharus guttatus*	Hermit Thrush				S5B			5	1	3		23	6	38
Shorebirds	*Larus argentatus*	Herring Gull				S5			1		4				5
Shorebirds	*Charadrius vociferus*	Killdeer				S3B			1	1	9		2		13
Passerines	*Empidonax minimus*	Least Flycatcher				S4S5B,S5M			6				11		17
Passerines	*Melospiza lincolnii*	Lincoln's Sparrow				S4B,S5M					1				1
Passerines	*Setophaga magnolia*	Magnolia Warbler				S5B			5	1	2		25	2	35
Diurnal Raptors	*Falco columbarius*	Merlin	NAR			S5B				2					2
Passerines	*Zenaida macroura*	Mourning Dove				S5			5		3		5		13
Passerines	*Geothlypis philadelphia*	Mourning Warbler				S4B,S5M							4		4
Passerines	*Cardinalis cardinalis*	Northern Cardinal				S4					1				1
Other Landbirds	*Colaptes auratus*	Northern Flicker				S5B			13	4	6	2	6	4	35
Diurnal Raptors	*Circus hudsonius*	Northern Harrier	NAR			S4B,S4S5M			2			1			3
Passerines	*Setophaga americana*	Northern Parula				S5B			8				23	1	32
Passerines	*Parkesia noveboracensis*	Northern Waterthrush				S4B,S5M			5			1	1		7
Passerines	*Contopus cooperi*	Olive-sided Flycatcher	SC	T	Threatened	S3B				1			6		7
Passerines	*Seiurus aurocapilla*	Ovenbird				S5B			54	3	2		68	5	132
Passerines	*Setophaga palmarum*	Palm Warbler				S5B						1	3		4
Other Landbirds	*Dryocopus pileatus*	Pileated Woodpecker				S5			11	3	2	1	2	1	20
Passerines	*Spinus pinus*	Pine Siskin				S3			3		2				5
Passerines	*Setophaga pinus*	Pine Warbler				S2S3B,S4S5M					1				1
Passerines	*Haemorhous purpureus*	Purple Finch				S4S5B,S3S4N,S5M			48	8	24	2	10	1	93
Passerines	*Sitta canadensis*	Red-breasted Nuthatch				S4S5			6	1	7	1	4		19
Passerines	*Vireo olivaceus*	Red-eyed Vireo				S5B			7	2	7		71	2	89
Diurnal Raptors	*Buteo jamaicensis*	Red-tailed Hawk	NAR			S5			1	1	1	5	1		9
Passerines	*Agelaius phoeniceus*	Red-winged Blackbird				S4B					1		11		12
Waterfowl	*Aythya collaris*	Ring-necked Duck				S5B			2						2
Other Landbirds	*Columba livia*	Rock Pigeon				SNA							1		1
Diurnal Raptors	*Buteo lagopus*	Rough-legged Hawk	NAR			S3N				1					1
Passerines	*Corthylio calendula*	Ruby-crowned Kinglet				S4B,S5M			17	4	5	1	13	1	41
Other Landbirds	*Archilochus colubris*	Ruby-throated Hummingbird				S5B			1	1	1	1	3		7
Other Landbirds	*Bonasa umbellus*	Ruffed Grouse				S5	12		14	6	7	1	3		43
Passerines	*Passerculus sandwichensis*	Savannah Sparrow				S4S5B,S5M					13		2		15
Passerines	*Plectrophenax nivalis*	Snow Bunting				S5N					1				1
Passerines	*Melospiza melodia*	Song Sparrow				S5B			5	8	8	9	14		44
Passerines	*Catharus ustulatus*	Swainson's Thrush				S4B,S5M			2				25	2	29
Passerines	*Melospiza georgiana*	Swamp Sparrow				S5B					3	2			5
Passerines	*Tachycineta bicolor*	Tree Swallow				S4B							2		2
Diurnal Raptors	*Cathartes aura*	Turkey Vulture				S2S3B,S4S5M			1						1
Passerines		Warbler sp										3			3
Passerines	*Vireo gilvus*	Warbling Vireo				S1B,SUM							1		1
Passerines	*Zonotrichia albicollis*	White-throated Sparrow				S4S5B,S5M			47	17	39	8	39	2	152
Passerines	*Loxia leucoptera*	White-winged Crossbill				S4S5			15						15
Passerines	*Troglodytes hiemalis*	Winter Wren				S5B			11	2			8		21
Passerines	*Hylocichla mustelina*	Wood Thrush	T	T		SUB			1						1
Passerines	*Setophaga petechia*	Yellow Warbler				S5B			4				7		11
Passerines	*Empidonax flaviventris*	Yellow-bellied Flycatcher				S4B,S5M			1						1

Table J2: Eigg Mountain Data Summary for All Bird Programs

Functional Group	Scientific Name	Common Name	Status				Number of Observations Recorded during 2025 Field Programs								
			COSEWIC	SARA	NSESA	AC CDC	Winter Residency	Nocturnal Owls	Spring Migration		Fall Migration		Breeding Birds	Nightjars	Total
									Point Counts	Passage Migration	Point Counts	Passage Migration			
Other Landbirds	*Sphyrapicus varius*	Yellow-bellied Sapsucker				S5B			3	2			4	1	10
Passerines	*Setophaga coronata*	Yellow-rumped Warbler				S5B			24	5	38	22	15	7	111
						TOTAL	**144**	**3**	**786**	**162**	**827**	**206**	**878**	**70**	**3076**

Table J3: MBBA Summary

Family Name	Science Name	Common Name	COSEWIC	SARA	NSESA	SRank	20NR64	20NR65	20NR66	20NR74	20NR75	20NR76	Highest Breeding Rank
Tyrannidae	*Empidonax alnorum*	Alder Flycatcher				S5B	Possible	Probable	Probable	Probable	Probable	Confirmed	Confirmed
Ardeidae	*Botaurus lentiginosus*	American Bittern				S3S4B,S4S5M			Confirmed	Probable	Probable		Confirmed
Anatidae	*Anas rubripes*	American Black Duck				S5B,S5N	Possible	Possible		Confirmed	Confirmed	Confirmed	Confirmed
Anatidae	*Anas platyrhynchos x rubripes*	American Black Duck x Mallard (hybrid)						Possible					Possible
Corvidae	*Corvus brachyrhynchos*	American Crow				S5	Confirmed	Probable	Confirmed	Confirmed	Confirmed	Confirmed	Confirmed
Fringillidae	*Spinus tristis*	American Goldfinch				S5	Probable	Probable	Confirmed	Probable	Confirmed	Probable	Confirmed
Falconidae	*Falco sparverius*	American Kestrel				S3B,S4S5M	Probable		Probable	Possible	Confirmed	Confirmed	Confirmed
Parulidae	*Setophaga ruticilla*	American Redstart				S5B	Probable	Confirmed	Probable	Confirmed	Confirmed	Confirmed	Confirmed
Turdidae	*Turdus migratorius*	American Robin				S5B,S3N	Confirmed	Confirmed	Confirmed	Confirmed	Confirmed	Confirmed	Confirmed
Anatidae	*Mareca americana*	American Wigeon				S4B,S4S5M						Probable	Probable
Scolopacidae	*Scolopax minor*	American Woodcock				S5B	Probable	Possible	Possible		Possible	Possible	Possible
Accipitridae	*Haliaeetus leucocephalus*	Bald Eagle	NAR			S5	Possible		Probable	Confirmed	Possible		Confirmed
Hirundinidae	*Riparia riparia*	Bank Swallow	T	T	Endangered	S2B			Possible	Confirmed			Confirmed
Hirundinidae	*Hirundo rustica*	Barn Swallow	SC	T	Endangered	S3B	Possible	Confirmed	Confirmed	Confirmed	Probable	Confirmed	Confirmed
Strigidae	*Strix varia*	Barred Owl				S5	Probable	Possible	Probable	Probable	Possible	Probable	Probable
Parulidae	*Setophaga castanea*	Bay-breasted Warbler				S3S4B,S4S5M	Possible			Possible		Probable	Probable
Alcedinidae	*Megaceryle alcyon*	Belted Kingfisher				S4S5B	Possible		Probable	Confirmed	Possible	Confirmed	Confirmed
Alcidae	*Cepphus grylle*	Black Guillemot				S4B			Probable				Probable
Parulidae	*Mniotilta varia*	Black-and-white Warbler				S5B	Confirmed	Confirmed	Confirmed	Possible	Confirmed	Confirmed	Confirmed
Picidae	*Picoides arcticus*	Black-backed Woodpecker				S3S4	Confirmed						Confirmed
Cuculidae	*Coccyzus erythropthalmus*	Black-billed Cuckoo				S3B	Possible			Possible			Possible
Paridae	*Poecile atricapillus*	Black-capped Chickadee				S5	Confirmed	Confirmed	Confirmed	Confirmed	Probable	Confirmed	Confirmed
Parulidae	*Setophaga caerulescens*	Black-throated Blue Warbler				S5B	Possible	Probable	Possible	Possible	Possible		Probable
Parulidae	*Setophaga virens*	Black-throated Green Warbler				S5B	Confirmed	Confirmed	Probable	Possible	Probable	Probable	Confirmed
Parulidae	*Setophaga fusca*	Blackburnian Warbler				S4B,S5M	Probable	Confirmed	Probable	Confirmed	Possible	Probable	Confirmed
Corvidae	*Cyanocitta cristata*	Blue Jay				S5	Possible	Possible	Confirmed	Confirmed	Probable	Probable	Confirmed
Vireonidae	*Vireo solitarius*	Blue-headed Vireo				S5B	Confirmed	Confirmed	Probable	Possible	Confirmed	Confirmed	Confirmed
Anatidae	*Spatula discors*	Blue-winged Teal				S3B				Possible	Possible		Possible
Icteridae	*Dolichonyx oryzivorus*	Bobolink	SC	T	Vulnerable	S3B	Possible		Probable	Probable	Confirmed	Probable	Confirmed
Paridae	*Poecile hudsonicus*	Boreal Chickadee				S3	Confirmed	Confirmed	Probable	Probable	Possible	Possible	Confirmed
Certhiidae	*Certhia americana*	Brown Creeper				S5	Possible	Possible		Possible	Confirmed	Confirmed	Confirmed
Mimidae	*Toxostoma rufum*	Brown Thrasher				S1B						Possible	Possible
Anatidae	*Branta canadensis*	Canada Goose				SUB,S4N,S5M				Confirmed	Confirmed		Confirmed
Parulidae	*Cardellina canadensis*	Canada Warbler	SC	T	Endangered	S3B	Confirmed	Probable			Confirmed	Confirmed	Confirmed
Parulidae	*Setophaga tigrina*	Cape May Warbler				S3B,SUM		Confirmed			Possible		Confirmed
Bombycillidae	*Bombycilla cedrorum*	Cedar Waxwing				S5B	Confirmed	Probable	Possible	Confirmed	Probable	Confirmed	Confirmed
Parulidae	*Setophaga pensylvanica*	Chestnut-sided Warbler				S5B	Confirmed	Possible	Probable	Possible	Probable	Possible	Confirmed
Apodidae	*Chaetura pelagica*	Chimney Swift	T	T	Endangered	S2S3B,S1M	Possible	Possible	Possible	Probable	Possible		Probable
Emberizidae	*Spizella passerina*	Chipping Sparrow				S4B,S5M	Possible		Confirmed	Possible	Confirmed	Possible	Confirmed
Hirundinidae	*Petrochelidon pyrrhonota*	Cliff Swallow				S2S3B	Confirmed			Possible		Probable	Confirmed
Anatidae	*Bucephala clangula*	Common Goldeneye				S4B,S4N,S5M		Possible					Possible
Icteridae	*Quiscalus quiscula*	Common Grackle				S5B	Confirmed	Confirmed	Confirmed	Confirmed	Confirmed	Confirmed	Confirmed
Gaviidae	*Gavia immer*	Common Loon	NAR			S4B	Possible	Possible		Probable			Probable
Anatidae	*Mergus merganser*	Common Merganser				S5B,S4N	Possible		Confirmed	Probable	Probable	Possible	Confirmed
Caprimulgidae	*Chordeiles minor*	Common Nighthawk	SC	SC	Threatened	S3B	Probable			Probable		Possible	Probable
Corvidae	*Corvus corax*	Common Raven				S5	Probable	Confirmed	Confirmed	Probable	Probable	Probable	Confirmed
Parulidae	*Geothlypis trichas*	Common Yellowthroat				S5B	Confirmed	Confirmed	Probable	Confirmed	Confirmed	Confirmed	Confirmed
Emberizidae	*Junco hyemalis*	Dark-eyed Junco				S4S5	Confirmed	Confirmed	Probable	Probable	Confirmed	Confirmed	Confirmed
Phalacrocoracidae	*Nannopterum auritum*	Double-crested Cormorant	NAR			S5B				Possible			Possible
Picidae	*Dryobates pubescens*	Downy Woodpecker				S5	Probable	Confirmed	Probable	Probable	Confirmed	Possible	Confirmed

Table J3: MBBA Summary

Family Name	Science Name	Common Name	COSEWIC	SARA	NSESA	SRank	20NR64	20NR65	20NR66	20NR74	20NR75	20NR76	Highest Breeding Rank
Tyrannidae	*Tyrannus tyrannus*	Eastern Kingbird				S3B	Possible			Confirmed	Confirmed		Confirmed
Tyrannidae	*Sayornis phoebe*	Eastern Phoebe				S4S5B,S4M				Possible			Possible
Tyrannidae	*Contopus virens*	Eastern Wood-Pewee	SC	SC	Vulnerable	S3S4B	Confirmed	Possible	Possible	Possible	Possible	Possible	Confirmed
Sturnidae	*Sturnus vulgaris*	European Starling				SNA	Confirmed		Confirmed	Confirmed	Confirmed	Confirmed	Confirmed
Fringillidae	*Coccothraustes vespertinus*	Evening Grosbeak	SC	SC	Vulnerable	S3B,S3N,S3M	Possible	Possible	Probable	Probable	Possible	Possible	Probable
Emberizidae	*Spizella pusilla*	Field Sparrow				SNA						Possible	Possible
Regulidae	*Regulus satrapa*	Golden-crowned Kinglet				S5	Confirmed	Confirmed	Possible	Possible	Possible	Confirmed	Confirmed
Mimidae	*Dumetella carolinensis*	Gray Catbird							Probable	Possible	Probable		Probable
Corvidae	*Perisoreus canadensis*	Gray Jay					Confirmed	Confirmed				Confirmed	Confirmed
Laridae	*Larus marinus*	Great Black-backed Gull				S4S5							
Ardeidae	*Ardea herodias*	Great Blue Heron				S4B,S4S5M		Possible				Possible	Possible
Strigidae	*Bubo virginianus*	Great Horned Owl				S4		Possible	Confirmed		Confirmed	Probable	Confirmed
Anatidae	*Anas crecca*	Green-winged Teal				S4S5B,S5M		Probable			Possible	Possible	Probable
Picidae	*Dryobates villosus*	Hairy Woodpecker				S5	Confirmed	Confirmed	Possible	Possible	Confirmed	Confirmed	Confirmed
Turdidae	*Catharus guttatus*	Hermit Thrush				S5B	Confirmed	Confirmed	Probable	Confirmed	Confirmed	Probable	Confirmed
Laridae	*Larus argentatus*	Herring Gull				S5							
Anatidae	*Lophodytes cucullatus*	Hooded Merganser				S4S5B,S5M	Confirmed	Probable		Confirmed			Confirmed
Passeridae	*Passer domesticus*	House Sparrow				SNA			Possible	Possible	Confirmed	Probable	Confirmed
Charadriidae	*Charadrius vociferus*	Killdeer				S3B				Possible	Confirmed	Confirmed	Confirmed
Tyrannidae	*Empidonax minimus*	Least Flycatcher				S4S5B,S5M	Probable	Possible	Possible	Possible	Probable	Possible	Probable
Emberizidae	*Melospiza lincolnii*	Lincoln's Sparrow				S4B,S5M	Confirmed	Confirmed		Possible	Possible	Confirmed	Confirmed
Strigidae	*Asio otus*	Long-eared Owl				S2S3						Confirmed	Confirmed
Parulidae	*Setophaga magnolia*	Magnolia Warbler				S5B	Confirmed	Confirmed	Confirmed	Confirmed	Probable	Confirmed	Confirmed
Anatidae	*Anas platyrhynchos*	Mallard				S5B,S5N				Probable	Possible	Confirmed	Confirmed
Falconidae	*Falco columbarius*	Merlin	NAR			S5B			Probable	Confirmed	Confirmed		Confirmed
Columbidae	*Zenaida macroura*	Mourning Dove				S5	Possible		Confirmed	Possible	Probable	Probable	Confirmed
Parulidae	*Geothlypis philadelphia*	Mourning Warbler				S4B,S5M	Confirmed	Confirmed	Possible	Possible	Possible	Confirmed	Confirmed
Parulidae	*Leiothlypis ruficapilla*	Nashville Warbler				S4B,S5M	Possible	Possible	Possible	Probable	Possible	Probable	Probable
Cardinalidae	*Cardinalis cardinalis*	Northern Cardinal				S4			Possible				Possible
Picidae	*Colaptes auratus*	Northern Flicker				S5B	Probable	Confirmed	Probable	Confirmed	Confirmed	Confirmed	Confirmed
Accipitridae	*Astur atricapillus*	Northern Goshawk						Confirmed	Possible		Confirmed	Confirmed	Confirmed
Accipitridae	*Circus hudsonius*	Northern Harrier	NAR			S4B,S4S5M		Possible	Probable		Possible	Possible	Probable
Mimidae	*Mimus polyglottos*	Northern Mockingbird				S1B					Probable		Probable
Parulidae	*Setophaga americana*	Northern Parula				S5B	Confirmed	Confirmed	Probable	Possible	Confirmed	Probable	Confirmed
Strigidae	*Aegolius acadicus*	Northern Saw-whet Owl				S4B,SUM		Possible	Possible		Confirmed		Confirmed
Parulidae	*Parkesia noveboracensis*	Northern Waterthrush				S4B,S5M	Possible	Possible	Possible	Possible	Possible	Probable	Probable
Tyrannidae	*Contopus cooperi*	Olive-sided Flycatcher	SC	SC	Threatened	S3B	Probable	Confirmed	Possible	Possible	Possible	Probable	Confirmed
Accipitridae	*Pandion haliaetus*	Osprey				S4S5B,S5M		Possible		Possible			Possible
Parulidae	*Seiurus aurocapilla*	Ovenbird				S5B	Confirmed	Confirmed	Probable	Confirmed	Probable	Probable	Confirmed
Parulidae	*Setophaga palmarum*	Palm Warbler				S5B	Possible	Possible		Possible		Confirmed	Confirmed
Vireonidae	*Vireo philadelphicus*	Philadelphia Vireo				S2?B,SUM						Possible	Possible
Podicipedidae	*Podilymbus podiceps*	Pied-billed Grebe				S4B	Confirmed						Confirmed
Picidae	*Dryocopus pileatus*	Pileated Woodpecker				S5		Possible	Probable	Probable	Confirmed	Probable	Confirmed
Fringillidae	*Pinicola enucleator*	Pine Grosbeak				S3B,S5N,S5M	Possible						Possible
Fringillidae	*Spinus pinus*	Pine Siskin				S3	Probable	Possible	Probable	Probable	Possible	Confirmed	Confirmed
Fringillidae	*Haemorhous purpureus*	Purple Finch				S4S5B,S3S4N,S5M	Confirmed	Probable	Confirmed	Possible	Probable	Possible	Confirmed
Fringillidae	*Loxia curvirostra*	Red Crossbill				S3S4						Confirmed	Confirmed
Anatidae	*Mergus serrator*	Red-breasted Merganser				S3B,S4S5N,S5M					Possible		Possible
Sittidae	*Sitta canadensis*	Red-breasted Nuthatch				S4S5	Probable	Confirmed	Confirmed	Confirmed	Possible	Possible	Confirmed
Vireonidae	*Vireo olivaceus*	Red-eyed Vireo				S5B	Confirmed	Confirmed	Probable	Probable	Confirmed	Probable	Confirmed

Table J3: MBBA Summary

Family Name	Science Name	Common Name	COSEWIC	SARA	NSESA	SRank	20NR64	20NR65	20NR66	20NR74	20NR75	20NR76	Highest Breeding Rank
Accipitridae	*Buteo jamaicensis*	Red-tailed Hawk	NAR			S5	Possible	Confirmed	Possible	Possible	Possible	Confirmed	Confirmed
Icteridae	*Agelaius phoeniceus*	Red-winged Blackbird				S4B	Probable		Possible	Confirmed	Confirmed	Probable	Confirmed
Anatidae	*Aythya collaris*	Ring-necked Duck				S5B	Confirmed	Confirmed		Confirmed		Probable	Confirmed
Phasianidae	*Phasianus colchicus*	Ring-necked Pheasant				SNA			Probable				Probable
Columbidae	*Columba livia*	Rock Pigeon				SNA			Possible	Confirmed	Confirmed	Confirmed	Confirmed
Cardinalidae	*Pheucticus ludovicianus*	Rose-breasted Grosbeak				S3B		Confirmed	Probable	Possible	Confirmed	Possible	Confirmed
Regulidae	*Corthylio calendula*	Ruby-crowned Kinglet				S4B,S5M	Confirmed	Confirmed	Probable	Possible	Possible	Confirmed	Confirmed
Trochilidae	*Archilochus colubris*	Ruby-throated Hummingbird				S5B	Probable	Confirmed	Probable	Probable	Probable	Confirmed	Confirmed
Anatidae	*Oxyura jamaicensis*	Ruddy Duck				S1B				Confirmed			Confirmed
Phasianidae	*Bonasa umbellus*	Ruffed Grouse				S5	Confirmed	Confirmed	Possible	Confirmed	Possible	Confirmed	Confirmed
Icteridae	*Euphagus carolinus*	Rusty Blackbird	SC	SC	Endangered	S2B	Confirmed	Confirmed			Confirmed	Possible	Confirmed
Emberizidae	*Passerculus sandwichensis*	Savannah Sparrow				S4S5B,S5M	Possible	Possible	Possible	Possible	Probable	Probable	Probable
Accipitridae	*Accipiter striatus*	Sharp-shinned Hawk	NAR			S5	Possible	Confirmed				Confirmed	Confirmed
Emberizidae	*Melospiza melodia*	Song Sparrow				S5B	Confirmed	Confirmed	Confirmed	Confirmed	Confirmed	Confirmed	Confirmed
Rallidae	*Porzana carolina*	Sora				S5B				Probable		Possible	Probable
Scolopacidae	*Actitis macularius*	Spotted Sandpiper				S3S4B,S5M	Confirmed		Confirmed	Probable	Possible		Confirmed
Phasianidae	*Canachites canadensis*	Spruce Grouse				S4						Confirmed	Confirmed
Turdidae	*Catharus ustulatus*	Swainson's Thrush				S4B,S5M	Possible	Confirmed	Probable	Possible	Probable	Probable	Confirmed
Emberizidae	*Melospiza georgiana*	Swamp Sparrow				S5B	Confirmed	Confirmed	Probable	Confirmed	Probable	Confirmed	Confirmed
Parulidae	*Leiothlypis peregrina*	Tennessee Warbler				S3S4B,S5M				Possible	Possible		Possible
Hirundinidae	*Tachycineta bicolor*	Tree Swallow				S4B	Probable	Confirmed	Confirmed	Confirmed	Confirmed	Possible	Confirmed
Turdidae	*Catharus fuscescens*	Veery				S4B	Possible		Probable	Probable	Probable	Probable	Probable
Rallidae	*Rallus limicola*	Virginia Rail				S2S3B				Probable			Probable
Sittidae	*Sitta carolinensis*	White-breasted Nuthatch				S4	Confirmed	Confirmed			Confirmed		Confirmed
Emberizidae	*Zonotrichia albicollis*	White-throated Sparrow				S4S5B,S5M	Confirmed	Confirmed	Probable	Probable	Confirmed	Probable	Confirmed
Fringillidae	*Loxia leucoptera*	White-winged Crossbill				S4S5	Possible	Possible					Possible
Tyrannidae	*Empidonax traillii*	Willow Flycatcher				S2B					Possible		Possible
Scolopacidae	*Gallinago delicata*	Wilson's Snipe				S3B,S5M	Probable			Probable		Possible	Probable
Parulidae	*Cardellina pusilla*	Wilson's Warbler				S3B,S5M		Possible					Possible
Troglodytidae	*Troglodytes hiemalis*	Winter Wren				S5B	Probable	Probable	Possible	Possible	Possible	Possible	Probable
Anatidae	*Aix sponsa*	Wood Duck				S5B	Possible			Confirmed	Possible	Possible	Confirmed
Parulidae	*Setophaga petechia*	Yellow Warbler				S5B	Possible	Possible	Probable	Probable	Confirmed	Probable	Confirmed
Tyrannidae	*Empidonax flaviventris*	Yellow-bellied Flycatcher				S4B,S5M	Possible	Possible	Possible		Possible	Confirmed	Confirmed
Picidae	*Sphyrapicus varius*	Yellow-bellied Sapsucker				S5B	Probable	Confirmed		Possible	Confirmed	Confirmed	Confirmed
Parulidae	*Setophaga coronata*	Yellow-rumped Warbler				S5B	Confirmed	Confirmed	Confirmed	Possible	Confirmed	Probable	Confirmed

Table J4: Eigg Mountain Survey Conditions

Survey Program	Survey Location	Date Surveyed	Weather	Temp (°C)	Wind (km)	Wind (Beaufort)
Breeding Birds	BB01	06-13-2025	Partial sun	12	18	3
	BB01	07-03-2025	Overcast	21	15	3
	BB02	06-12-2025	Clear	14	10	2
	BB02	07-03-2025	Overcast	21	15	3
	BB03	06-12-2025	Clear	14	10	2
	BB03	07-03-2025	Overcast	21	15	3
	BB05	06-12-2025	Clear	14	10	2
	BB05	06-12-2025	Clear	14	10	2
	BB05	07-03-2025	Overcast	21	15	3
	BB05	07-04-2025	Overcast	20	6	2
	BB06	06-12-2025	Clear	14	10	2
	BB06	07-03-2025	Overcast	21	15	3
	BB07	06-12-2025	Clear	19	10	2
	BB07	07-03-2025	Overcast	21	15	3
	BB08	06-13-2025	Partial sun	12	18	3
	BB08	07-03-2025	Overcast	21	15	3
	BB09	06-13-2025	Partial sun	12	18	3
	BB09	07-03-2025	Overcast	21	15	3
	BB10	06-13-2025	Partial sun	12	18	3
	BB10	07-04-2025	Overcast	20	6	2
	BB11	06-13-2025	Partial sun	12	18	3
	BB11	07-03-2025	Overcast	21	15	3
	BB12	06-12-2025	Clear	14	10	2
	BB12	07-03-2025	Overcast	21	15	3
	BB13	06-12-2025	Clear	19	10	2
	BB13	07-03-2025	Overcast	21	15	3
	BB14	06-12-2025	Clear	14	10	2
	BB14	07-03-2025	Overcast	21	15	3
	BB15	06-12-2025	Clear	14	10	2
	BB15	07-03-2025	Overcast	21	15	3
	BB16	06-12-2025	Clear	14	10	2
	BB16	07-03-2025	Overcast	21	15	3
	BB17	06-12-2025	Clear	14	10	2
	BB17	07-04-2025	Overcast	20	6	2
	BB18	06-12-2025	Clear	14	10	2
	BB18	07-04-2025	Overcast	20	6	2
	BB19	06-12-2025	Clear	14	10	2
	BB19	07-04-2025	Overcast	20	6	2
	BB20	06-13-2025	Partial sun	12	18	3
	BB20	07-04-2025	Overcast	20	6	2
	BB21	06-13-2025	Partial sun	12	18	3
	BB21	07-04-2025	Overcast	20	6	2
	BB22	06-13-2025	Partial sun	12	18	3
	BB22	07-04-2025	Overcast	20	6	2

Table J4: Eigg Mountain Survey Conditions

Survey Program	Survey Location	Date Surveyed	Weather	Temp (°C)	Wind (km)	Wind (Beaufort)
	BB23	06-12-2025	Clear	14	10	2
	BB23	07-04-2025	Overcast	20	6	2
	BB24	06-12-2025	Clear	21	10	2
	BB24	07-03-2025	Overcast	21	15	3
	BB25	06-13-2025	Partial sun	12	18	3
	BB25	07-04-2025	Overcast	20	6	2
	BB26	06-13-2025	Partial sun	12	18	3
	BB26	07-04-2025	Overcast	20	6	2
Fall Migration	FM01	09-12-2025	Partial sun	12	16	3
	FM01	08-28-2025	Sun	13	9	2
	FM01	09-26-2025	Drizzle	18	24	4
	FM01	10-16-2025	Overcast	10	10	2
	FM02	09-12-2025	Partial sun	12	16	3
	FM02	08-28-2025	Sun	13	9	2
	FM02	09-25-2025	Sun	4	1	1
	FM02	10-17-2025	Overcast	9	13	3
	FM03	09-12-2025	Partial sun	10	15	3
	FM03	09-25-2025	Sun	4	1	1
	FM03	10-17-2025	Overcast	9	13	3
	FM03	11-07-2025	Overcast	0	22	4
	FM05	09-11-2025	Drizzle	13	4	1
	FM05	08-28-2025	Sun	13	9	2
	FM05	09-12-2025	Partial sun	13	15	3
	FM05	09-25-2025	Sun	4	1	1
	FM05	09-26-2025	Rain	18	12	3
	FM05	10-16-2025	Partial sun	11	10	2
	FM05	10-17-2025	Overcast	9	13	3
	FM05	11-07-2025	Overcast	0	22	4
	FM06	09-12-2025	Partial sun	13	15	3
	FM06	09-26-2025	Rain	18	12	3
	FM06	10-17-2025	Overcast	9	13	3
	FM06	11-07-2025	Overcast	0	22	4
	FM07	09-12-2025	Partial sun	10	15	3
	FM07	09-25-2025	Sun	4	1	1
	FM07	10-17-2025	Overcast	9	13	3
	FM07	11-07-2025	Overcast	0	22	4
	FM08	09-12-2025	Partial sun	12	16	3
	FM08	09-26-2025	Drizzle	18	24	4
	FM08	10-17-2025	Drizzle	10	13	3
	FM09	09-12-2025	Partial sun	12	16	3
	FM09	08-28-2025	Sun	13	9	2
	FM09	09-26-2025	Rain	18	24	4
	FM09	10-16-2025	Overcast	10	10	2
	FM10	09-11-2025	Drizzle	13	4	1

Table J4: Eigg Mountain Survey Conditions

Survey Program	Survey Location	Date Surveyed	Weather	Temp (°C)	Wind (km)	Wind (Beaufort)
	FM10	10-17-2025	Overcast	10	13	3
	FM10	11-07-2025	Overcast	0	22	4
	FM11	09-12-2025	Partial sun	12	16	3
	FM11	08-28-2025	Sun	13	9	2
	FM11	09-26-2025	Drizzle	18	24	4
	FM11	10-16-2025	Overcast	10	10	2
	FM12	08-28-2025	Sun	13	9	2
	FM12	09-12-2025	Partial sun	13	15	3
	FM12	09-26-2025	Rain	18	12	3
	FM12	10-17-2025	Overcast	9	13	3
	FM13	09-12-2025	Partial sun	10	15	3
	FM13	09-25-2025	Sun	4	1	1
	FM13	10-17-2025	Overcast	9	13	3
	FM13	11-07-2025	Overcast	0	22	4
	FM14	09-12-2025	Partial sun	13	15	3
	FM14	09-25-2025	Sun	4	1	1
	FM14	10-17-2025	Overcast	9	13	3
	FM14	11-07-2025	Overcast	0	22	4
	FM15	09-12-2025	Partial sun	10	15	3
	FM15	09-25-2025	Sun	4	1	1
	FM15	10-17-2025	Overcast	9	13	3
	FM15	11-07-2025	Overcast	0	22	4
	FM16	09-12-2025	Partial sun	12	16	3
	FM16	08-28-2025	Sun	13	9	2
	FM16	09-25-2025	Sun	4	1	1
	FM16	10-17-2025	Overcast	9	13	3
	FM17	09-11-2025	Drizzle	13	4	1
	FM17	08-28-2025	Sun	13	9	2
	FM17	09-25-2025	Sun	4	1	1
	FM17	10-16-2025	Partial sun	11	10	2
	FM18	09-12-2025	Partial sun	12	16	3
	FM18	08-28-2025	Sun	13	9	2
	FM18	09-25-2025	Sun	4	1	1
	FM18	10-17-2025	Overcast	9	13	3
	FM19	09-11-2025	Drizzle	13	4	1
	FM19	09-25-2025	Sun	4	1	1
	FM19	10-17-2025	Overcast	10	13	3
	FM19	11-07-2025	Overcast	0	22	4
	FM20	09-11-2025	Drizzle	13	4	1
	FM20	09-26-2025	Rain	18	12	3
	FM20	10-17-2025	Overcast	10	13	3
	FM20	11-07-2025	Overcast	0	22	4
	FM21	09-11-2025	Drizzle	13	4	1
	FM21	09-26-2025	Rain	18	12	3

Table J4: Eigg Mountain Survey Conditions

Survey Program	Survey Location	Date Surveyed	Weather	Temp (°C)	Wind (km)	Wind (Beaufort)
	FM21	10-17-2025	Overcast	10	13	3
	FM21	11-07-2025	Overcast	0	22	4
	FM22	09-11-2025	Drizzle	13	4	1
	FM22	09-26-2025	Rain	18	12	3
	FM22	10-17-2025	Overcast	10	13	3
	FM22	11-07-2025	Overcast	0	22	4
	FM23	09-11-2025	Drizzle	13	4	1
	FM23	08-28-2025	Sun	13	9	2
	FM23	09-25-2025	Sun	4	1	1
	FM23	10-17-2025	Overcast	10	13	3
	FM24	09-12-2025	Partial sun	10	15	3
	FM24	09-25-2025	Sun	4	1	1
	FM24	10-17-2025	Overcast	9	13	3
	FM24	11-07-2025	Overcast	0	22	4
	FM25	09-12-2025	Partial sun	12	16	3
	FM25	09-25-2025	Sun	4	1	1
	FM25	10-17-2025	Drizzle	10	13	3
	FM26	09-12-2025	Partial sun	12	16	3
	FM26	09-26-2025	Drizzle	19	27	4
	FM26	10-17-2025	Drizzle	10	13	3
Nightjar and Owl	NJ01	06-11-2025	Clear	15	20	4
	NJ02	06-11-2025	Clear	15	20	4
	NJ03	06-11-2025	Clear	15	20	4
	NJ04	06-12-2025	Overcast	11	7	2
	NJ05	06-12-2025	Overcast	11	7	2
	NJ06	06-12-2025	Overcast	11	7	2
	NJ07	06-11-2025	Clear	15	20	4
	NJ08	06-11-2025	Clear	15	20	4
	NJ09	06-11-2025	Clear	15	20	4
	NJ10	06-11-2025	Clear	15	20	4
	NJ13	07-03-2025	Clear	25	10	2
	NJ14	06-11-2025	Clear	15	20	4
	OW01	04-02-2025	Clear	-2	17	3
	OW09	04-02-2025	Clear	-2	17	3
Spring Migration	EM01	04-03-2025	Partial sun	-3	6	2
	EM04	04-03-2025	Partial sun	-3	6	2
	EM05	04-03-2025	Partial sun	-3	6	2
	EM06	04-03-2025	Partial sun	-3	6	2
	SM01	04-03-2025	Partial sun	-3	6	2
	SM02	04-03-2025	Partial sun	-3	6	2
	SM03	04-03-2025	Partial sun	-3	6	2
	SM04	04-03-2025	Partial sun	-3	6	2
	SM05	04-03-2025	Partial sun	-3	6	2
	SM06	04-03-2025	Partial sun	-3	6	2

Table J4: Eigg Mountain Survey Conditions

Survey Program	Survey Location	Date Surveyed	Weather	Temp (°C)	Wind (km)	Wind (Beaufort)
	SM07	04-03-2025	Partial sun	-3	6	2
	SS01	04-29-2025	Overcast	3	7	2
	SS01	05-13-2025	Sun	9	23	4
	SS01	05-29-2025	Sun	17	17	3
	SS02	04-29-2025	Overcast	3	7	2
	SS02	05-14-2025	Partial sun	2	8	2
	SS03	04-29-2025	Overcast	3	7	2
	SS03	05-14-2025	Partial sun	2	8	2
	SS04	04-29-2025	Overcast	3	7	2
	SS04	05-14-2025	Partial sun	2	8	2
	SS05	04-29-2025	Overcast	3	7	2
	SS05	05-13-2025	Sun	4	17	3
	SS05	05-29-2025	Sun	17	17	3
	SS06	05-14-2025	Partial sun	2	8	2
	SS06	05-30-2025	Overcast	13	6	2
	SS07	04-29-2025	Overcast	3	7	2
	SS07	05-14-2025	Partial sun	2	8	2
	SS08	04-29-2025	Overcast	3	7	2
	SS08	05-13-2025	Sun	7	17	3
	SS08	05-30-2025	Overcast	13	6	2
	SS09	04-29-2025	Overcast	3	7	2
	SS09	05-13-2025	Sun	9	23	4
	SS09	05-29-2025	Sun	17	17	3
	SS10	05-01-2025	Partial sun	2	30	5
	SS10	05-13-2025	Sun	4	17	3
	SS10	05-30-2025	Drizzle	11	6	2
	SS11	04-29-2025	Overcast	3	7	2
	SS11	05-13-2025	Sun	7	17	3
	SS11	05-29-2025	Sun	17	17	3
	SS12	04-29-2025	Overcast	3	7	2
	SS12	05-14-2025	Partial sun	2	8	2
	SS13	05-14-2025	Partial sun	2	8	2
	SS14	04-29-2025	Overcast	3	7	2
	SS14	04-29-2025	Overcast	3	7	2
	SS14	05-14-2025	Partial sun	2	8	2
	SS15	04-29-2025	Overcast	3	7	2
	SS15	05-14-2025	Partial sun	2	8	2
	SS16	04-29-2025	Overcast	3	7	2
	SS16	05-13-2025	Sun	7	17	3
	SS17	04-29-2025	Overcast	3	7	2
	SS17	05-13-2025	Sun	7	17	3
	SS17	05-30-2025	Partial sun	15	6	2
	SS18	04-29-2025	Overcast	3	7	2
	SS18	05-13-2025	Sun	7	17	3

Table J4: Eigg Mountain Survey Conditions

Survey Program	Survey Location	Date Surveyed	Weather	Temp (°C)	Wind (km)	Wind (Beaufort)
	SS18	05-30-2025	Partial sun	15	6	2
	SS19	05-01-2025	Partial sun	2	30	5
	SS19	05-13-2025	Sun	7	17	3
	SS19	05-29-2025	Sun	17	17	3
	SS20	05-30-2025	Drizzle	11	6	2
	SS22	05-30-2025	Drizzle	11	6	2
Winter	EM01	01-15-2025	Overcast	-4	30	5
	EM01	02-10-2025	Sun	-11	9	2
	EM02	12-18-2025	Sun	4	17	3
	EM02	01-14-2025	Overcast	-5	9	2
	EM03	12-18-2025	Sun	4	17	3
	EM03	01-14-2025	Overcast	-5	13	3
	EM04	12-18-2025	Sun	4	17	3
	EM05	02-10-2025	Sun	-11	10	2
	EM05	02-11-2025	Sun	-11	11	2
	EM06	02-11-2025	Overcast	-15	16	3
	EM07	01-14-2025	Overcast	-5	13	3
	Starting point: 45.569629, -62.137473	03-04-2025	Sun	-6	9	2
	Starting point: 45.728264, -64.069269	03-03-2025	Partial sun	-20	11	2
Fall Migration	P01	09-12-2025	Partial sun	14	22	4
	P01	09-26-2025	Rain	18	33	5
	P02	09-12-2025	Overcast	12	20	4
	P02	08-28-2025	Sun	18	13	3
	PM01	10-16-2025	Partial sun	11	9	2
	PM01	11-07-2025	Overcast	1	32	5
	PM02	09-26-2025	Drizzle	20	28	4
	PM02	10-16-2025	Overcast	10	10	2
	PM02	11-07-2025	Overcast	1	32	5
	PM03	11-07-2025	Overcast	1	32	5
	PM04	11-07-2025	Overcast	1	32	5
	PM05	11-07-2025	Overcast	1	32	5
	PM06	11-07-2025	Overcast	1	32	5
	PM07	11-07-2025	Overcast	1	32	5
Spring Migration	PC01	04-29-2025	Sun	9	3	1
	PC01	05-14-2025	Overcast	10	13	3
	PC01	05-29-2025	Sun	23	19	3
	PC02	05-01-2025	Partial sun	4	35	5
	PC02	05-01-2025	Sun	7	34	5
	PC02	05-13-2025	Sun	9	23	4
	PC02	05-29-2025	Sun	21	19	3