SNIPE WORLD CHAMPIONSHIP 2026 MAHÓN · MENORCA

Weather & Tactics Intelligence Report, Rev. 3 — Wind, Waves, Current and Depth: Fully Measured Edition

VENUE	RACING	RACE AREAS
Club Marítimo de Mahón	**September 19–26, 2026**	**ALFA (south) / BRAVO (north) — final SI coordinates**
WIND DATA	TIDE / CURRENT	
LEMH + Boya de Mahón buoy + SIMAR + GEBCO (2016–2025)	**No tide · background current avg 0.3 kt (measured, §7)**	

Where Rev. 3 stands: On top of Rev. 2 (LEMH airport wind data), this edition integrates the **Boya de Mahón measurement buoy (waves, wind, water temperature), the SIMAR 2137117 wave hindcast (waves, wind, current), the GEBCO bathymetry grid, and LEMH temperature and present-weather codes**. Sea state, current, depth, thunderstorm frequency and the sea-breeze temperature rule are now all measured (◎). SIMAR model and buoy wave heights agree within 1% on regime averages, so the wave statistics are highly reliable. Confidence markers are the same as in Rev. 1: ◎ measured / published ○ climatological estimate △ physical inference (to be verified on site).

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Four items newly measured or corrected in Rev. 3:

① **"No current" is corrected.** There is still no tidal stream, but the measured background current averages **0.3 kt, 0.5 kt at the 90th percentile, 1 kt max** (§7). On light days it cannot be ignored for laylines and starts.

② **The assumption "wind on the water is 1–3 kt stronger than the airport" is dropped.** Checked against 1,608 hours of buoy data, **on-the-water wind ≈ airport wind** (near-identical after height correction; r = 0.84). Read the §5 wind bands as they are, with no correction.

③ **Offshore, the sea breeze settles at about 120–125° (ESE).** That is 15–20° further east (left) than the airport's 140° (SIMAR 122° and buoy 124° agree independently). Think of the afternoon beat axis as ESE.

④ **Cross seas go from "warning" to "normal".** On **50%** of days, wind waves and swell 60° or more apart coexist during racing hours; on **36%** of days it's a cross sea for most of the day. The day after a Tramuntana, there is a **90%** chance of leftover N swell (0.3 m or more) (§7).

— Confirmed in Rev. 2 (still valid):

① **North and south are the reverse of Rev. 1's assumption.** With the final coordinates, ALFA is **south** (about 0.7–1 nm SSE of the La Mola headland) and BRAVO is **north** (about 1.1 nm N of the headland). The §8 side bias has been completely rebuilt.

② **SW–W offshore breeze is the most frequent regime during the event window (about 29%).** Rev. 1 underestimated it at about 15%. Pressure-lane racing and compass accuracy matter more than expected.

③ **The sea-breeze veer is "done by midday".** At the airport, the sea breeze fills from the east (about 090°), veers about 50° clockwise between 09:00 and 13:00, and **locks in at about 140° (SE) from 14:00**. Rev. 1's "sustained veer toward S→SSW through the afternoon" is not supported by the airport data. For afternoon starts, the base case is "steady + oscillating", not "still veering".

01 ALFA / BRAVO Race Area Layout (Final SI Coordinates)

Final coordinates from the Sailing Instructions ◎: **ALFA 39°51.838'N, 004°20.009'E / BRAVO 39°53.539'N, 004°19.621'E**. The two areas sit north and south of **Punta de s'Esperó, Menorca's easternmost point (tip of the La Mola peninsula, cliffs about 50–90 m)**, about 1.7 nm apart centre to centre (BRAVO is almost due north of ALFA, about 350°). ALFA is about 0.7–1 nm SSE of the headland and 0.8–1 nm off the southeast shore; BRAVO is about 1.1 nm N of the headland and 1.2–1.5 nm off the western shoreline (toward Cala Mesquida). Shore distances are approximate chart readings ○.

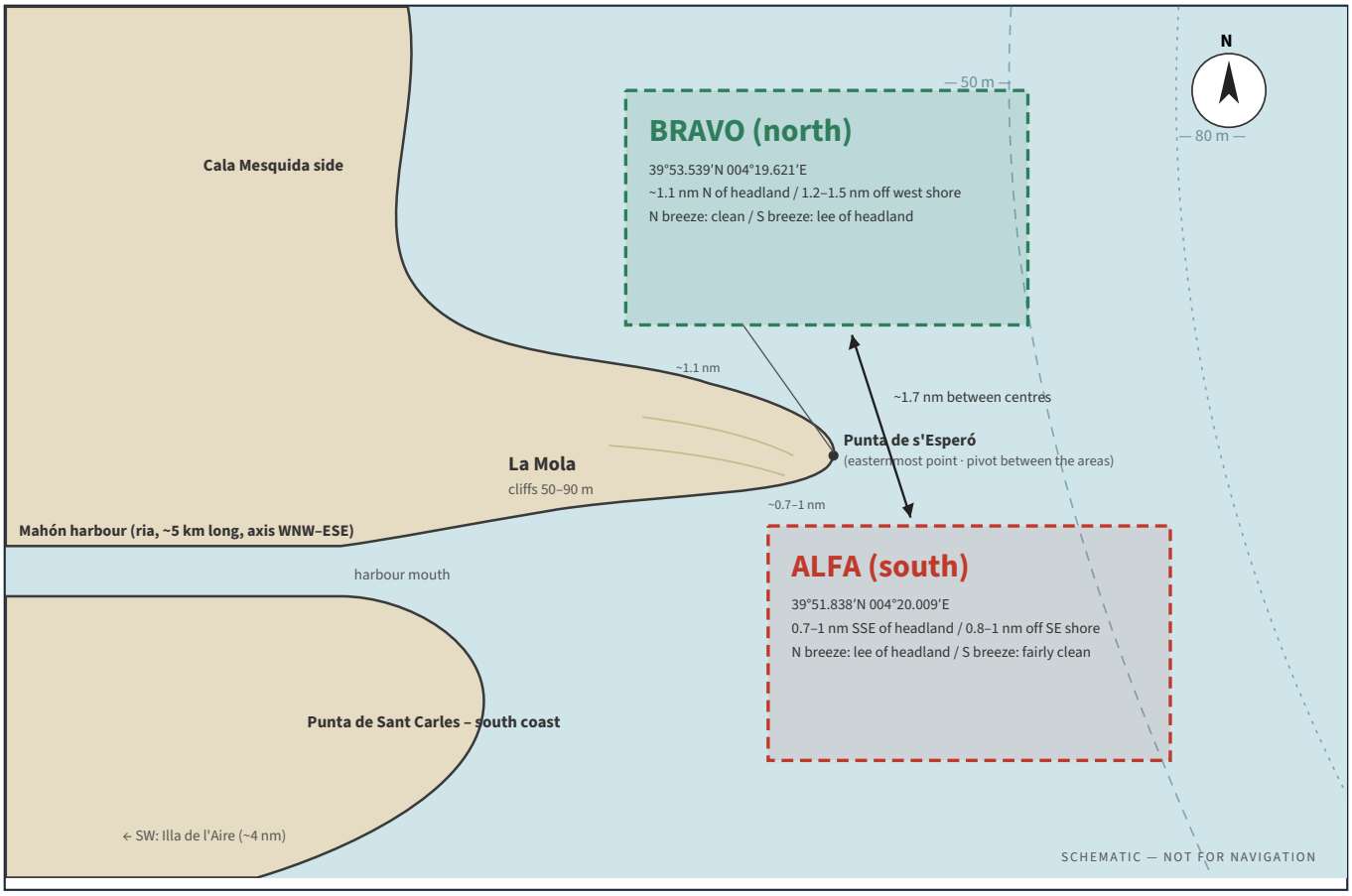


Fig. 1 | Final layout of ALFA / BRAVO (schematic based on SI coordinates ◎; shoreline and shore distances are conceptual ○). Note that **north and south are reversed from Rev. 1**: ALFA = south, BRAVO = north.

Character of the two areas (final coordinates): The pivot is Punta de s'Esperó. **GEBCO depths are 40–60 m in both areas (ALFA centre 48 m, BRAVO centre 52 m) — deep water, no shoals on the course** ◎. Waves are not modified by depth; differences between the areas come entirely from headland shelter and reflection. The La Mola plateau peaks at 58–79 m in GEBCO (smoothed at ~450 m resolution; the real cliff line reaches about 90 m ○). **For the same wind direction, the sign of the cliff effect flips depending on which side of the headland you are on.** In a northerly (Tramuntana), BRAVO is clean and ALFA is in the lee of the cliffs; in S–SE (sea breeze) the roles reverse — ALFA is clean and BRAVO's south edge comes under the headland's influence. Check your fleet's course-area assignment every morning and read §8 "on your area's line".

02 Wind Direction Frequency (September, Racing Hours) — Measured

Eight-point direction frequencies from all LEMH (Menorca Airport) METAR observations (30-min) for September 2016–2025, **11:00–17:00 local** ◎. The airport is inland in the southeast of the island (elevation about 90 m), so wind speed there needs checking against the water (see §5); **the direction pattern itself transfers to the race areas.**

TABLE 2 | WIND DIRECTION FREQUENCY — SEPTEMBER · 11:00–17:00 · LEMH MEASURED (100% INCLUDING 5.0% CALM/ VARIABLE)

Dir.	Local name	Measured	Rev. 1 est.	What the data showed
N	Tramuntana	**14.3%**	24%	Pure north is less common than expected (skews NNE–NE)
NE	Gregal	**18.4%**	13%	**One of the most frequent directions.** The northerly family is mostly NE in practice
E	Llevant	**16.5%**	9%	Nearly double the estimate. Includes the easterly early phase of the sea breeze (§4)
SE	Xaloc / sea breeze	**6.1%**	8%	Roughly as expected
S	Migjorn / sea breeze	**11.8%**	14%	Roughly as expected
SW	Llebeig	**17.2%**	9%	**Much higher.** Increases in the afternoon (§4, §8)
W	Ponent	**9.1%**	6%	Somewhat higher
NW	Mestral	**1.7%**	11%	**Much lower.** NW hardly occurs (probably bent around by the island's terrain)
—	Calm / variable	**5.0%**	6%	Roughly as expected

Summary (measured): Northerly family N+NE+NW ≈ **34%** (Rev. 1 est. 48%), E ≈ **17%**, sea-breeze family SE+S ≈ **18%**, SW+W ≈ **26%**. **The real picture is not "half northerly" but "a three-way split between NE, E and SW, plus the sea breeze".** By hour, N drops from 24% at 10:00 to 13% at 15:00 while SW rises from 10% to 21%: **a clear daily cycle — northerlies in the morning, more SW and S in the afternoon as thermal effects kick in** ◎.

03 Wind Regime Classification — 300 Measured Days

Each day was classified automatically from direction persistence, wind speed and the morning history during the core racing window (11:00–17:00) ◎. Criteria: **Tramuntana** = N sector (330–030°) for most of the day and mean ≥ 8 kt / **Sea breeze** = 090–200° for most of the day, with light air or a land breeze in the morning / **NE Gregal, E Llevant, SW–W** = persistent in their sector / **Light / transition** = daytime mean below 6 kt, no settled direction.

TABLE 3 | REGIME FREQUENCY (LEMH MEASURED, 2016–2025)

Regime	All Sept (300 days)	Sept 15–30 (160 days)	Sept 19–26 (event window, 80 days)	Daytime mean wind (11:00–17:00)
SW–W offshore (Llebeig / Ponent)	25%	31%	**29%**	8.6 kt (P90: 13 kt)
Sea breeze (E→SE, Migjorn type)	28%	24%	**26%**	8.5 kt (P90: 14 kt)
Tramuntana (N–NNE)	17%	18%	**19%**	13.3 kt (P90: 20 kt, max 34 kt)
NE Gregal	14%	13%	**14%**	10.5 kt (steady all day)
Light / transition	9%	10%	**9%**	under 5 kt
E Llevant (persistent easterly), light N, other	7%	5%	**4%**	9–10 kt

> **The biggest update since Rev. 1:** The most frequent regime during the event window is the **SW–W offshore breeze (about 29% = 2–2.5 days out of 8)**, followed by the sea breeze (26%) and Tramuntana (19%). The "northerlies dominate" picture that Rev. 1 was built around adds up to only about **33% even including NE Gregal**. **Skill at the offshore shift game and the veering sea-breeze game is where the points are at these Worlds.** The fact that Tramuntana is the main heavy-air regime is unchanged by the measurements (P90 20 kt; mean gust factor 1.66 when gusts were reported ◎).

TABLE 3B | EVENT WEEK (9/19–26) BY YEAR — THE "MILD YEAR" vs "NORTHERLY YEAR" SPLIT ◎

Year	Daytime mean	Week max	Tramuntana days	Sea-breeze days	Light days
2016	6.8 kt	16 kt	2	5	1
2017	8.4 kt	15 kt	1	2	1
2018	8.3 kt	17 kt	2	1	2
2019	9.5 kt	20 kt	1	1	0
2020	10.6 kt	24 kt	1	1	0
2021	11.4 kt	19 kt	1	3	1
2022	10.8 kt	19 kt	**4**	2	0
2023	8.6 kt	19 kt	1	0	1

Year	Daytime mean	Week max	Tramuntana days	Sea-breeze days	Light days
2024	8.8 kt	16 kt	0	3	1
2025	10.1 kt	18 kt	2	3	0

In none of the 10 years did the week's maximum stay below 15 kt. **Every year brought at least one windy day**, while the daytime mean varied widely from 6.8 to 11.4 kt. The conclusion for gear and crew-weight strategy: treat the 6–10 kt sea-breeze / offshore mode as the main battlefield, but always bring a 15–20 kt Tramuntana mode as well.

04 Hourly Wind Evolution by Regime — Measured

Mean wind speed by hour for each regime (LEMH, local time) ◎. Don't read the overall average — **read the row for the regime you've got.**

TABLE 4 | MEAN WIND SPEED (KT) BY REGIME AND HOUR (SEPTEMBER, 2016–2025)

Regime	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	Measured direction behaviour
Tramuntana	12.2	12.7	**13.8**	13.7	13.6	13.2	12.9	12.6	Veers slowly 002°→019° through the day. Peak 12:00–13:00, high gust factor
NE Gregal	9.8	10.1	10.3	10.3	10.6	10.7	**10.8**	10.9	Veers 033°→054° into the afternoon (sea-breeze component merging in). Holds into the evening
Sea breeze (E→SE)	7.3	8.0	**8.8**	8.8	8.7	8.5	8.5	8.4	**092° (09:00) → 118° (11:00) → 139° (13:00) → 141–143° (locked from 14:00). Offshore it locks at about 120–125° (ESE)**
SW–W offshore	6.1	7.2	8.4	8.9	**9.5**	9.3	8.6	8.1	271° (09:00) → 235° (12:00): **backs through the morning**, then oscillates around 235°
E Llevant	8.9	8.7	9.1	9.5	**9.8**	9.7	9.7	9.1	Veers gently from NE-ish to E (085–088°)
Light / transition	4.3	3.9	4.4	5.1	5.4	5.3	4.4	4.9	Leftover N in the morning (348°) → tries to flip to a southerly (206°) around 13:00 → falls apart again late afternoon

Sea-breeze days: mean direction by hour (measured)



Fig. 4a | Mean direction on sea-breeze days (LEMH, composite of 83 days) ◎. **The veer happens in the morning.** Starts between 11:00 and 13:00: base case is "a persistent right shift in progress"; from 14:00, "oscillations around ~140°".

Sea-breeze onset time distribution (83 measured days)

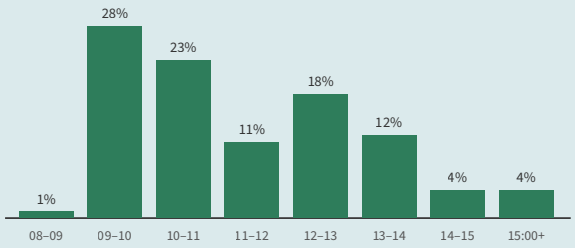


Fig. 4b | Sea-breeze onset time (local time at which 090–200° at 6 kt or more became sustained) ◎. **Median 10:30; 52% established before 11:00.** Much earlier than Rev. 1's "fills between 12:00 and 14:00". These are inland airport values — allow a 30–60 min delay offshore △. **Offshore, it locks at about 120–125° (ESE)**: SIMAR (122°) and the buoy (124°) agree independently, 15–20° east of the airport's 140° ◎. The race is already on by the time you leave the harbour for Race 1.

05 Wind Speed Band Probabilities — Measured

Distribution of all daytime (11:00–17:00) observations by wind speed band ◎. **Key correction in Rev. 3: checked against 1,608 hours of Boya de Mahón buoy data, wind on the water is essentially the same as at the airport** (buoy at 3 m averages 1 kt less → near-identical when corrected to 10 m; r = 0.84) ◎. Rev. 2's "+1–3 kt correction" is dropped; **read the table below as on-the-water values, with no correction.**

TABLE 5 | WIND SPEED BAND PROBABILITIES — SEPT 15–30 · 11:00–17:00 · LEMH MEASURED

Band (airport)	Prob.	On the water (buoy-verified)	Main regimes	What it means in a Snipe
<6 kt	**17%**	Same as airport	Light / transition; sea breeze before it fills	AP and shortened-course risk. Favours lighter teams
6–10 kt	**43%**	**Most frequent band. 6–10 kt on the water too**	Most sea-breeze and SW–W days	**The main battlefield.** Power mode and speed in flat water to small chop
10–15 kt	**29%**	Same as airport	Sea-breeze peak / NE, E / moderate Tramuntana	Crossover from full power to depower. Let the sea state decide
15–18 kt	**8%**	Same (in Tramuntana, buoy mean 13.9 kt, P90 21.4 kt — matches LEMH)	Typical Tramuntana	Keeping the boat flat decides results
18–23 kt	**2.3%**	Same	Strong Tramuntana	Survival mode. Expect gusts 30–60% above the mean
>23 kt	**0.7%**	Same	Tramuntana gale / autumn low	High chance of abandonment or postponement

Day by day ◎: On **25% of days (about 2 days out of 8)** the wind reaches 15 kt or more at some point during racing hours; 18 kt or more on 8% (about 0.6 days); and 16% are light days with a daytime mean under 6 kt (about 1.3 days). Rev. 1's "1.5–2 days over 15 kt / 0.5–1 days where racing is in doubt" was close to the measurements, but **the distribution is centred lighter than Rev. 1 assumed, with 6–10 kt the single most frequent band.** The organisers' "expected average of 12 kt" sits in the upper part of the distribution — **it does not mean most days are 12 kt** (the measured daytime mean is about 9 kt at both the airport and on the water).

06 Tactical Characteristics by Wind Direction (Updated with Measured Data)

N — Tramuntana (N–NNE)

`Measured: daytime mean 13.3 kt · P90 20 kt · max 34 kt`

Character

Long fetch down from the Gulf of Lion. Dry, cool, excellent visibility. Very persistent — comes in spells of 1–3 days ◎. Frequency during the event window is 19% = **an expected 1.5 days out of 8**.

On the water

Veers very slowly through the day, 002°→019° ◎. In observations with gusts reported, the mean gust factor was 1.66 (≈ 22 kt gusts on a 13 kt mean) ◎. **ALFA (south area) is in the lee of the La Mola cliffs** — turbulent, with puffs and holes △; BRAVO gets it straight off open water.

Shift pattern

Direction is steady (±10–15°) but with short-period, gust-driven shifts. **Pressure first**, oscillations second.

Watch out

Tramuntana usually blows harder on the water than forecast. If 18 kt is forecast, rig for 22. It peaks at 12:00–13:00 — Race 1 is usually the windiest.

NE — Gregal (northeasterly)

`Measured: daytime 10.3–10.9 kt · holds into the evening`

Character

14% frequency. Gentler and steadier than Tramuntana, with an unusual daily cycle in which **15:00–17:00 is the measured peak** ◎. The breeze holds for afternoon racing — a day that gets races in.

On the water

Veers 033°→054° over the day ◎ (sea-breeze component merging in). Onshore and uniform, but expect a local corner-acceleration zone right under Punta de s'Esperó △.

Shift pattern

Long period, small amplitude (±5–10°) + **a slow veer through the day**. A game of line bias and lane management.

Watch out

NE waves roll straight in — lots of pitching. The right keeps getting better as the afternoon goes on — don't lead to the left layline.

SE — Sea breeze (E→SE, Migjorn type)

Measured: peak 8.8 kt (12:00–13:00) · locked at 140° from 14:00

Character

26% frequency. **Fills early (median 10:30 at the airport)**, starts from about 092°, **veers about 12°/h from 09:00 to 13:00 and locks at about 140° from 14:00** ◎. 30–60 min later offshore △.

On the water

Smooth, small waves. Little boat-speed separation, so starts and side choice carry the most weight. Airport peak 8.8 kt → about 10–12 kt on the water ○.

Shift pattern

Morning = persistent right shift / afternoon = oscillating — tactics change with the time of day. Before 13:00, don't close off the right; after 14:00 it's the classic wait-for-the-shift game.

Watch out

Rev. 1's assumption (continued veer toward S→SSW in the afternoon) is rejected by the data. **Overtrusting the right and banging the corner in the afternoon is negative expected value.** On cross-sea days, with the previous day's N swell running at right angles, the boat gets thrown around.

SW — Llebeig / Ponent (SW–W offshore)

Measured: most frequent regime 29% · 9.5 kt peak at 14:00

Character

The most frequent regime in the event window (about 29% = 2–2.5 days out of 8) ◎. Light and W-ish (271°) early, **backs to SW (235°) through the morning**, then oscillates around 235° from midday, with a speed peak at 14:00 ◎.

On the water

An offshore breeze coming over the island sends pressure lanes (streaks of stronger breeze) down the course. Flat water near the shore. **A funnel flow out of the Mahón harbour ria** may create a separate streak from ALFA's north edge to off the harbour mouth △.

Shift pattern

±15–25° short-period oscillations. A **compass game** — tack on the headers with precision. In the morning a backing persistent component sits on top (early races tend to pay left).

Watch out

Fall into the lull between lanes and you lose the leg. Always watch three puffs ahead. Time spent training in this regime is where the points are at these Worlds.

E — Llevant (persistent easterly)

Measured: rare, 1–5% · 9–10 kt · waves dominate

Character

A persistent Llevant is rare during the event window (1% measured) ◎. But E as a direction shows up every morning as the sea breeze fills — don't jump to "E = Llevant".

On the water

A genuine Llevant has the longest fetch and big waves for its wind speed. Least terrain bias — a clean, honest race area.

Shift pattern

Steady. Boat speed over tactics. Changing modes for the waves is what matters.

Watch out

E from the morning with overcast and humid air = Llevant (watch for building seas); clear sky, morning calm, then E = the start of the sea breeze (expect it to veer). **Read the sky to tell the two easterlies apart.**

— Light / transition day

Measured: 9% (about 0.7 days in 8) · around 5 kt

Character

Leftover northerly (348°) in the morning → tries to flip to a southerly (206°) around 13:00 → falls apart again in the late afternoon ◎. The data confirm Rev. 1's "tug-of-war" picture.

On the water

Only leftover swell. Pitching losses when underpowered are the main enemy.

Shift pattern

90°-class swings. Bet on **the new breeze (usually from the sea = southerly)**, not the old one.

Watch out

Be ready for long APs: food, water, sun protection. Banging a corner out of frustration after a long wait is the biggest point-loser.

07 Waves, Swell & Current — Measured

Integration of SIMAR 2137117 (hourly wave hindcast, 2016–2025) and the Boya de Mahón measurement buoy ◎. Regime-average Hs from the two sources agree within 1% (e.g. Tramuntana 1.83 m vs 1.82 m). The observation point is an open-sea reference location about 8–10 nm SE of the race areas; **on the race areas closer to shore, waves will be somewhat smaller than the table (especially ALFA in northerlies, sheltered by the headland)** ○.

TABLE 7 | MEASURED DAYTIME SEA STATE BY REGIME (SEPTEMBER · 11:00–17:00 · SIMAR, BUOY-VERIFIED)

Regime (event-window freq.)	Hs mean	Hs P75	Hs P90	Max in period	Mean Tp	What it means in a Snipe
SW–W (29%)	0.87 m	1.11 m	1.69 m	3.9 m	5.9 s	Little local wind chop, but **leftover swell on top**. Flatter closer to shore. Flat-water speed is the top priority
Sea breeze E→SE (26%)	0.85 m	1.12 m	1.69 m	2.4 m	5.6 s	Sea-breeze chop + the previous day's swell. Truly flat water is actually the exception (see cross-sea stats below)
Tramuntana (19%)	**1.83 m**	2.60 m	3.38 m	**5.1 m**	7.3 s	Bigger than Rev. 2's estimate (1–2 m). **Plan for 1.5–2.5 m as standard in BRAVO**, 3 m on strong days. ALFA is sheltered by the headland, but watch for confused reflected chop △
NE Gregal (14%)	0.99 m	1.34 m	1.72 m	2.1 m	6.2 s	Straight onshore waves. Work on upwind pitching control
Light / transition (9%)	0.82 m	1.12 m	1.67 m	2.9 m	5.9 s	**No wind doesn't mean no waves** — light air on top of ~0.8 m leftover swell. Pitching losses when underpowered are the main enemy

Cross seas are normal ◎: Wind waves and swell (60° or more apart, swell 0.3 m or more) coexist during racing hours on **50%** of days, and it's a cross sea for most of the day on **36%**. In particular, **the day after a Tramuntana there is a 90% chance of leftover N swell** — if the next day switches to sea breeze (ESE), the new chop and the old N swell run almost at right angles. **Make "check yesterday's wind every morning and assume a two-layer sea state" a standard routine.** This is why the boat can feel lumpy even in 6–10 kt.

Current (newly measured in Rev. 3) ◎: There is no tidal stream, but a background current (Balearic Sea circulation + wind-driven drift) averages **0.27 kt, 0.48 kt at P90, 1.0 kt max**. It has no fixed direction, but sets toward E–S–SW about 68% of the time, a slight southerly bias. **0.5 kt or more is present 8% of the time** — on a light day (6 kt of wind) with 0.3–0.5 kt of current, that is worth ±3–5° on the layline, and the whole fleet drifts 40–80 m during a 5-minute starting sequence. **On light days, make a pre-start transit check and a current check near the marks (look at which way the wake streams off the anchored mark boat) part of the routine.**

08 First-Beat Side Bias — Rebuilt on Final Coordinates

The core of this report. Rev. 1 was written assuming "ALFA = north, BRAVO = south", the reverse of the final coordinates (ALFA = south, BRAVO = north), so this section has been rewritten from scratch. The pivot is Punta de s'Esperó between the two areas (cliffs 50–90 m): **in a northerly the downwind area is ALFA; in S–SE the downwind area is BRAVO.** Terrain effects described here are fluid-dynamics inference △ (regime frequencies and rotation are measured ◎), so **verify them on the water on the official practice days.**

N · TRAMUNTANA

ALFA: right (offshore / east) ○ / BRAVO: weak bias — play the pressure

ALFA (south) is the area in the lee. The N flow accelerates as it wraps around the corner of Punta de s'Esperó, creating a band of **stronger breeze, shifted slightly right (more NNE)**, east to southeast of the headland. ALFA's left side (inshore, toward the harbour mouth) gets separated, turbulent flow off the cliffs — mixed puffs and holes, and a lower mean wind speed.

ALFA mechanism: N flow crossing the 50–90 m cliffs separates at the edge and leaves a turbulent wake 0.5–1 km downwind (5–10× the cliff height). ALFA's windward mark (about 0.7 nm S of the headland) is likely to sit on the edge of this zone. Off the side of the headland, streamline compression gives 10–20% acceleration. → **The left (inshore) is a lottery ticket that sometimes pays; the right (offshore) is the reliable dividend.** Side effect: waves are smaller than in BRAVO (sheltered by the headland), but watch for confused reflected chop.

BRAVO: Clean breeze from open water upwind, **but full-size waves** (Hs 1–2 m). Little terrain bias — just race the pressure and the puff lanes. If anything, avoid going too far left toward the west shore.

How to verify: When a northerly fills on a practice day, run two-boat 5-minute split tests ×2 in ALFA-equivalent water. Record the compass difference between the left and right laylines (if the right is veered 5° or more, the hypothesis is confirmed).

NE · GREGAL

ALFA: value on the left (toward the headland) — with discipline / BRAVO: middle → right in the afternoon

The NE flow grazes the southeast face of the headland. In ALFA (SSE of the headland), the compression zone off the side of the headland extends as a tongue into the left side of the course (NW, toward the headland), and because the flow bends to follow the shoreline, it tends to give a **lift on port tack**. BRAVO gets a straightforward onshore breeze from open water.

ALFA mechanism: With an onshore component, the cliff wake does not fall on ALFA; headland acceleration dominates. Stay out of the 50–100 m wind shadow right under the headland and the left pays twice — pressure and angle. **Discipline: go 70% of the way left, then tack back** — overstand into the lull under the headland and you're done.

BRAVO: Terrain effect is limited. Measured Gregal **veers 033°→054° through the day** and peaks at 15:00–17:00 — **the later the race, the more weight on the right.** Leading to the left layline is the most expensive mistake in this regime.

How to verify: On port tack heading toward the headland, log your heading every minute. If the lift builds as you close the headland, it's confirmed. Mark the distance off the shore where the lull begins with GPS.

SEA BREEZE · E→SE

Until 13:00: right ◎ in both areas (measured veer) / From 14:00: middle + play the shifts; BRAVO avoid the right corner near the headland

The regime where the data rewrote Rev. 1. The sea breeze **veers from about 092° at about 12°/h between 09:00 and 13:00, then locks at about 140° (SE) from 14:00** ◎. The "persistent right shift" is a morning phenomenon; in the afternoon it oscillates around about 140°.

Morning to 13:00 (still veering): Textbook persistent shift — "get to the right first, put up with the headers". Log the wind direction every 15 minutes from the moment you leave the harbour and put a number on the day's rate of veer (°/h) — above 3°/h, stick with the right; **the time the veer stops is the time to switch tactics.**

From 14:00 (locked in): The right shift that paid you in the morning won't come any more. Protect your lane in the middle and play the ±10° shifts. **Offshore, the lock direction is about 120–125° (ESE)** ◎ — set your compass reference on ESE, not the airport's 140°. **Continually banging the right corner is negative expected value** (a correction from Rev. 1).

Area difference △: The established SE (140°) comes across La Mola, so **BRAVO's right corner (headland side, SW) is inside the separation zone**. In BRAVO, even when you go right, stay 0.3–0.5 nm off the headland. ALFA has open water upwind and clean breeze — on sea-breeze days ALFA is the "honest" race area.

How to verify: On two sea-breeze practice days, record the time the veer stops (when the direction stops changing). Check how far the offshore lock direction differs from the airport's 140° (it may come in further east on the race area).

SW–W OFFSHORE · LLEBEIG / PONENT

Morning: persistent left component (measured) / From midday: oscillating in both areas; harbour-mouth jet hypothesis on ALFA's left edge

The most frequent regime (29%). Measured: W-ish (271°) early, **backs to SW (235°) through the morning**, then oscillates ±15–25° ◎. Morning races get a weak persistent left shift; from midday it's a pure pressure-lane and oscillation game.

Both areas: Offshore streaks coming over the island and fast ±15–25° shifts. A compass game — tack on the headers with precision. Don't marry one pressure lane; always look three lanes upwind. The biggest loss is sitting in the lull between lanes for a whole leg.

ALFA-specific △: The "harbour-mouth jet" hypothesis — the Mahón ria (axis about 290°) collects the SW–W flow and **pushes out an accelerated, right-shifted streak** from the harbour mouth. The mouth is about 0.9 nm WNW of ALFA, so the jet may cross ALFA's left (NW) edge. **If you catch it, tack back upwind and bank it — don't trust it completely.**

BRAVO-specific △: The SW flow reaches BRAVO after crossing the La Mola plateau (50–90 m), so **the south side (right side of the beat) has high variance — turbulence and lulls**. Trust the shifts to revert to the mean and stay out of the corners.

How to verify: On a SW practice day, sail back and forth from directly off the harbour mouth to ALFA's left edge, logging the anemometer, and record the streak's position, width and pulse period (in minutes). This will be the single most valuable on-site observation.

LIGHT / TRANSITION · <6 KT

No call — bet on the new breeze (usually from the sea = southerly)

Measured typical pattern: leftover N (348°) in the morning → attempts to flip to a southerly (206°) around 13:00 → doesn't establish ◎. About 0.7 days in 8.

Rules: Go toward the new breeze, not a revival of the old one. Watch cloud-base movement and dark patches on the water for the new breeze arriving. Assume long APs — food, water and sun protection. **Banging a corner out of frustration is the biggest point-loser.** When thunderstorm cells are visible, throw out side-bias theory entirely and make your position relative to the cells the top priority.

Verdict colour key: **left** / **right** / **middle**.

09 What's Special About September 19–26 — Measured

Rev. 1 compared early vs late September using estimates; this edition has measurements for the event window itself (10 years × 8 days = 80 days).

TABLE 9 | ALL SEPTEMBER vs EVENT WINDOW (9/19–26), MEASURED

Item	All Sept	Sept 19–26	What it means
Sea-breeze days	28%	**26%**	The sea breeze is still alive in late September, but the ceiling is low: airport peak 8.8 kt (about 10–12 kt on the water)
SW–W days	25%	**29%**	**More offshore days later in the month.** Top training priority
Tramuntana days	17%	**19%**	The "late September turns more northerly" tendency is real, but modest
Days with a daytime max of 15 kt+	24%	**25%**	About 2 days a week. All 10 years recorded a week max of 15 kt or more
Days with a daytime mean under 6 kt	13%	**16%**	A little over 1 day a week. Plenty of time to sail 9 races, but a light day will come
Year-to-year spread	—	**mean 6.8–11.4 kt**	See Table 3B. The "mild year" / "northerly year" split is real

Thunderstorm risk, now measured ◎: Thunderstorms (TS) were observed on **25% of days in the event window (9/19–26) = 2.0 days per race week**. Year-to-year variation is large: from 0 days (2019) to 4 days (2016, 2021). And **thunderstorms cluster between 13:00 and 17:00 — right in the middle of racing hours.** Some precipitation occurs on 30% of days (2.4 days a week). If a DANA (cut-off low) hits, you get the full package: thunderstorms, gusts, sudden wind shifts and a Tramuntana blast the next day — 2020 (week max 24 kt) and 2022 (4 Tramuntana days) in Table 3B were years of this type. **Checking CAPE and upper-level lows at the morning briefing is not "insurance" but a mandatory step.** On those days, positioning relative to the cells takes priority over side-bias theory.

Sea-breeze temperature rule (new in Rev. 3 — local rule complete) ◎: On weak-gradient days (sea-breeze candidates), **if the forecast max temperature is 27°C or more, the sea breeze fills 92% of the time**; below 27°C it's 69%, and below 25°C just 62%. The physical basis is the measured SST (event-window mean 25.7°C) — whether the land heats up at least 1.5°C above the sea is almost exactly the dividing line. **Practical morning rule: on weak-gradient days, the forecast max temperature alone tells you in advance whether it's a sea-breeze day or a messy transition day.** But temperature predicts whether the sea breeze fills, not how strong it gets (almost no correlation, r = 0.14) — "will it come in?" and "how many knots?" are separate questions.

10 Race-Day Decision Matrix (Rev. 2)

Pick the one row that matches the morning forecast. **Print just this page and put it in a waterproof case. Rev. 2: fully updated for the final layout (ALFA = south / BRAVO = north) and the measured rotation rules.**

RACE-DAY DECISION MATRIX — MAHÓN 2026 · REV.2

SNIPE WORLDS · SEP 19–26 · ALFA (S) / BRAVO (N) · VERDICT = FAVOURED SIDE ON THE FIRST BEAT · CONFIDENCE ◎○△ · FREQUENCIES = 10 YEARS MEASURED

Morning forecast (freq.)	Measured daytime behaviour	First-beat side	Waves	Setup & start notes	Biggest risk
SW–W 6–12 kt Llebeig / Ponent (29%, most frequent)	W early → backs to SW 235° through the morning ±15–25° oscillations from midday; 9.5 kt peak at 14:00	**Morning: slight left ○** **From midday: play the shifts ◎** **A: left-edge jet △**	0.2–0.5 m flat near shore	Compass game. Flat-water speed. Ride the jet, then tack back. Watch 3 puffs ahead	Losing a leg in the lull between lanes. B: turbulence on the south side (flow over the headland)
Calm AM → E-ish Sea breeze (26%)	Veers from 092° at 12°/h **Locked from 14:00: offshore about 120–125° (ESE)**; peak around 9 kt	**To 13:00: right ◎ ride the veer** **From 14:00: middle + shifts ◎** B: avoid the right corner near the headland △	0.3–0.8 m nearly flat	Full power. Log wind direction every 15 min from leaving harbour → find when the veer stops. While it's veering: lead right, put up with headers	Overtrusting the right in the afternoon and banging the corner. Cross sea from yesterday's N swell
N 15 kt+ Tramuntana, strong (the strong end of the 19%)	Peak 12:00–13:00; direction veers slightly N→NNE Gust factor 1.66 (when reported)	**A: right ○ into the headland acceleration band; left = lulls under the cliffs** **B: race the pressure ◎**	N 1–2 m A: sheltered by the headland + reflected waves	Max depower. In A, stay out of the 0.3 nm under the cliffs. Race 1 is usually the windiest — pace yourself	Stronger than forecast. Attrition from broaches and capsizes
N 10–14 kt Tramuntana, moderate	Eases gradually in the afternoon; may shift right as a S component mixes in	**A: right ○** **B: middle △**	N 0.8–1.2 m	Top of the full-power range. In the afternoon, watch for a building right shift and don't close off the right	Once the N→S transition starts: big shifts, AP
NE 9–13 kt Gregal (14%)	Veers 033°→054° through the day **Unusual 15:00–17:00 peak**	**A: left ○ headland acceleration + port lift; 70% rule** **B: middle → right in the PM ○**	NE 0.8–1.5 m lots of pitching	Slightly deeper sail draft for the waves. The later the race, the more weight on the right	Leading to the left layline. Dying in the lull under the headland
<6 kt variable Transition day (9%)	Leftover N 348° AM → tries S 206° around 13:00 Doesn't settle; big swings	**No call** Go toward the new breeze — usually from the sea (S)	Leftover swell only	Light-air setup, weight forward. Long AP: food, water, sun protection	Banging a corner out of frustration. If thunder cells approach, throw out all theory

Morning check order: ① Upper-level low / CAPE (thunderstorm day? Measured: 2 days a week, 13:00–17:00) → ② If weak gradient, forecast max temperature (**27°C or more = sea breeze 92%**) → ③ Identify the regime (the row in this table) → ④ **Your course area (A south / B north)** → ⑤ Yesterday's wind (after a Tramuntana, 90% chance of leftover N swell) → ⑥ On light days, check the current (background 0.3–0.5 kt) → ⑦ After leaving the harbour, log the wind direction every 15 min and update the hypothesis. △ items must be upgraded to ○ by measurements on the 9/19–20 practice days before you rely on them.

11 Data Sources & Remaining Tasks

The three-layer structure from Rev. 2. The wind statistics that were ○ in Rev. 1 have been upgraded to measured ◎. The remaining ○ and △ items are listed below.

TABLE 11 | INFORMATION LAYERS (REV. 2)

Layer	Content	Confidence
Measured / published	ALFA/BRAVO coordinates (SI) / LEMH METAR 2016–2025 (wind, temperature, weather codes): regime frequency, rotation rules, thunderstorms 25%, sea-breeze 27°C rule / Boya de Mahón buoy (waves, wind, water temperature): sea state, water wind ≈ airport, SST 25.7°C / SIMAR 2137117: wind-sea vs swell separation, cross-sea stats, current 0.3 kt / GEBCO: 40–60 m depth in both areas, no shoals	◎
Climatological estimate	Interpolating wave height from the open-sea point (8–10 nm offshore) to the race areas closer to shore / real cliff height (GEBCO smoothed 58–79 m → real 90 m class) / dynamical background of DANA-type years	○
Physical inference	Flow around La Mola and cliff separation (ALFA's left in northerlies / BRAVO's right in SE), harbour-mouth jet, reflected waves (clapotis) in ALFA — all awaiting on-site verification	△

Remaining tasks (in priority order):

① **English version**: same structure, for the crew (all the data is in place) — **completed with this document.**

② **On-site verification (9/19–20 practice days)**: work through the §8 △ hypotheses (headland acceleration band, extent of the lulls under the cliffs, harbour-mouth jet, confused chop in ALFA) using the protocol in each panel. Cross-check onboard anemometer logs against LEMH and the buoy at matching times.

③ **Race-week routine**: every morning, brief with AROME/Harmonie 1–2 km models + the check order in §10 of this report. Check the buoy's live readings (Portus "Tiempo Real") before leaving the harbour.

④ If needed, refine the cliff-line profile with high-resolution terrain data (IDE Menorca LiDAR).

SNIPE WORLD CHAMPIONSHIP 2026 · MAHÓN, MENORCA · SEP 19–26 · REV.3 (2026-09-01) · ENGLISH EDITION
DATA: LEMH METAR (IOWA ENV. MESONET) · BOYA DE MAHÓN & SIMAR 2137117 (PUERTOS DEL ESTADO) · GEBCO 2026 GRID · SCHEMATIC CHARTS, NOT FOR NAVIGATION.

Measured items (◎) are based on statistics from the airport, the buoy and model reanalysis. The wave and wind observation points are 8–10 nm SE of the race areas, so systematic differences may exist closer to shore. Estimates (○) and inferences (△) are working hypotheses that assume on-site verification; on race day, the latest official forecast and briefing take priority.

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