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Bollettino Meteo Operativo per la Long Offshore Race (ITA)

Cari partecipanti e membri dell'organizzazione,

Questa è la nostra analisi conclusiva per la Long Offshore Race. Abbiamo integrato tutti i dati disponibili, dalle mappe orarie ai profili verticali, per fornirvi un quadro ad alta risoluzione delle condizioni che affronterete da domani mattina fino al ritorno.

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1. Contesto Sinottico e Meccanismi Chiave (11–12 Settembre)

Il quadro sinottico per la regata è dominato da una profonda saccatura atlantica che si allontana e da un campo di alta pressione che si stende sull'Alto Adriatico. Questo crea un **gradiente debole** che non genera un vento sinottico forte, ma lascia il posto a meccanismi più locali:

- **Brezza di mare:** Il vento principale sarà una brezza da **S–SSW**, generata dal gradiente termico tra l'Istria e il mare, che si rafforza nel pomeriggio.
- **Drainage notturno:** Sulle coste del Kvarner, il raffreddamento notturno della terra (effetto baroclinico) genererà brezze di terra da **NE/ENE** che potranno tagliare la brezza da SSW.

Questa dinamica spiega il perché il vento sarà "leggibile" ma con variazioni a livello di mesoscala.

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2. Giovedì 11: Analisi Operativa Ora per Ora (Start Race)

- **11:00–13:00 (Partenza e uscita Golfo):** La partenza avverrà con un vento da **SE** tra **5–8 nodi**. L'aria sarà stabile (CAPE basso) e il mare quasi calmo.
    - **Consiglio tattico:** Cercare la fascia di vento migliore verso il centro del Golfo, evitando l'ombra della costa.
- **13:00–15:00 (Verso Piran–Novigrad–Poreč):** Il vento ruoterà a **S–SSW** con un'intensità tra **8–12 nodi**. Il mare sarà poco mosso (0.2–0.4 m).
    - **Consiglio tattico:** Navigare a 1–4 miglia dalla costa per sfruttare il flusso migliore.
- **15:00–18:30 (Poreč–Rovinj–Porer):** Questa è la finestra di massima intensità del vento. Il Maestrale si presenterà come un flusso più teso (jet costiero) da **SSW** di **10–14 nodi**, con punte di **15–17 nodi** su Rovinj e Porer.
    - **Consiglio tattico:** Sfruttare la canalizzazione tra i promontori, mantenendosi sul bordo esterno della brezza.
- **18:30–22:30 (Porer–Unije / ingresso Kvarner):** Qui avverrà la transizione notturna. Il vento da SSW si attenuerà gradualmente (11→7 nodi), mentre un nuovo vento da **NE/ENE** (drainage) si innescherà dal Velebit. Si formerà una zona di transizione (lull) tra Porer e Unije.

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- **Consiglio tattico:** Osservare le prime "lingue" di vento da NE sull'acqua e prepararsi a virare non appena entra il nuovo vento.

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3. Notte e Venerdì 12: Verso la Fine della Regata

- **Notte (Giovedì-Venerdì):** Nel Kvarner orientale, il vento da NE si manterrà tra **8–12 nodi**. Nella parte occidentale del Golfo, il vento sarà più debole e variabile (3–7 nodi). Il mare sarà incrociato nella zona di transizione tra Porer e Unije.
- **Venerdì 12 (Diurno):** Il vento tornerà a un regime di brezza da **SSW** tra **8–12 nodi**. L'affidabilità su questo schema è alta.

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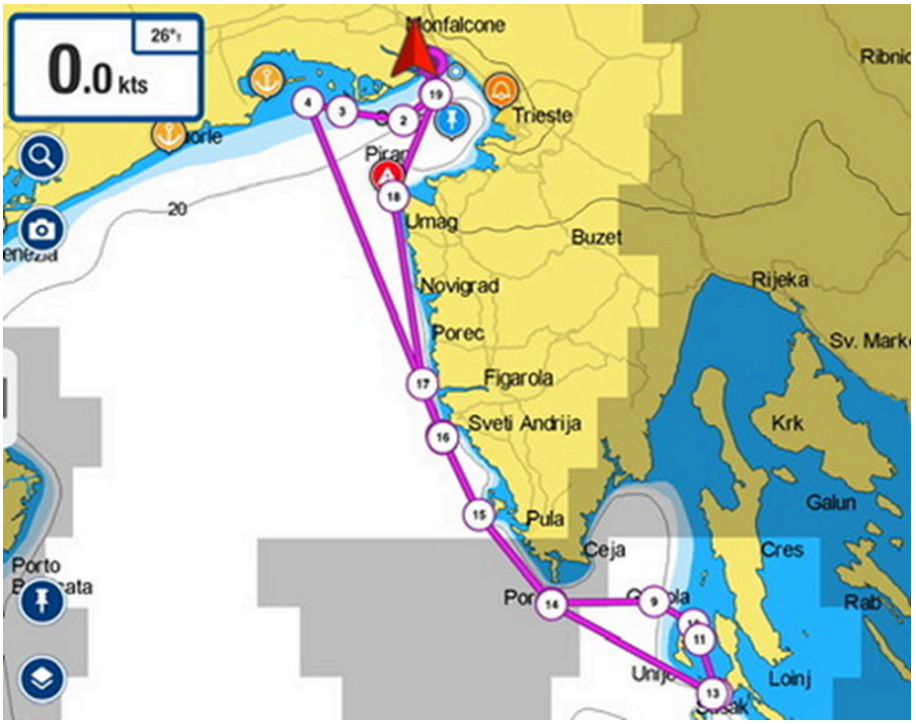
4. Rischi, Affidabilità e Consigli Pratici

- **Affidabilità:** La previsione ha un'affidabilità **medio-alta** per il pomeriggio di giovedì, con un'ottima convergenza su vento e direzione. L'affidabilità è **media** per la transizione serale, dove i tempi e la posizione del cambio di vento possono variare.
- **Rischi:** Il rischio di temporali è ormai nullo. Il principale rischio sarà la gestione delle zone di vento morto nella transizione serale e il mare incrociato tra le due brezze.
- **Conclusione:** La regata sarà un test di resistenza e tattica, dove l'abilità di leggere i micro-cambiamenti del vento sarà determinante.



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Operational Weather Bulletin for the Long Offshore Race (ENG)

Dear participants and organizing committee,

This is our conclusive analysis for the Long Offshore Race. We have integrated all available data, from hourly synoptic maps to vertical profiles, to provide you with a high-resolution forecast of the conditions you will face from tomorrow morning until the return.

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1. Synoptic Context and Key Mechanisms (September 11–12)

The synoptic picture for the race is dominated by a deep Atlantic trough moving away and a high-pressure system extending over the Upper Adriatic. This creates a **weak gradient** that does not generate a strong synoptic wind, but makes way for more local mechanisms:

- **Sea breeze:** The main wind will be a **S–SSW** breeze, generated by the thermal gradient between Istria and the sea, which strengthens in the afternoon.
- **Nightly drainage:** On the coasts of the Kvarner, the nighttime cooling of the land (baroclinic effect) will generate land breezes from **NE/ENE** that can cut the SSW breeze.

This dynamic explains why the wind will be "readable" but with variations at the mesoscale level.

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2. Thursday 11: Hour-by-Hour Operational Analysis (Race Start)

- **11:00 AM–1:00 PM (Start and Gulf Exit):** The start will take place with a **SE** wind of **5–8 knots**. The air will be stable (low CAPE) and the sea almost calm.
    - **Tactical advice:** Look for the better wind band towards the center of the Gulf, avoiding the coastal shadow.
- **1:00 PM–3:00 PM (Towards Piran–Novigrad–Poreč):** The wind will shift to **S–SSW** with an intensity between **8–12 knots**. The sea will be slightly choppy (0.2–0.4 m).
    - **Tactical advice:** Sail 1–4 miles offshore to take advantage of the best flow.
- **3:00 PM–6:30 PM (Poreč–Rovinj–Porer):** This is the window of maximum wind intensity. The Maestrale will present as a tighter flow (coastal jet) from **SSW** of **10–14 knots**, with peaks of **15–17 knots** over Rovinj and Porer.
    - **Tactical advice:** Exploit the channeling between the headlands, staying on the outer edge of the breeze.
- **6:30 PM–10:30 PM (Porer–Unije / Kvarner entrance):** The nightly transition will occur here. The SSW wind will gradually decrease (11→7 knots), while a new wind from **NE/ENE** (drainage) will be triggered from the Velebit. A transition zone (lull) will form between Porer and Unije.
    - **Tactical advice:** Watch for the first "tongues" of NE wind on the water and be ready to tack as soon as the new wind enters.

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3. Night and Friday 12: Toward the End of the Race

- **Night (Thursday–Friday):** In the eastern Kvarner, the NE wind will stay between **8–12 knots**. In the western part of the Gulf, the wind will be weaker and more variable (3–7 knots). The sea will be choppy in the transition zone between Porer and Unije.
- **Friday 12 (Daytime):** The wind will return to a **SSW** breeze regime between **8–12 knots**. The reliability of this pattern is high.

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4. Risks, Reliability, and Practical Advice

- **Reliability:** The forecast has **medium-high** reliability for Thursday afternoon, with excellent convergence on wind and direction. Reliability is **medium** for the evening transition, where the timing and position of the wind shift may vary.
- **Risks:** The risk of thunderstorms is now nil. The main risks will be managing the lulls in the evening transition and the choppy sea where the two breezes meet.
- **Conclusion:** The race will be a test of endurance and tactics, where the ability to read micro-changes in the wind will be decisive.

1) Synoptic-scale dynamics → why the weather will behave as forecast

General setup (11–12): a deep Atlantic trough over the N Atlantic (centres ~980–990 hPa), jet WSW–ENE. Over the North Adriatic a **slack pressure field (1016–1020 hPa)** prevails: near-surface geostrophic forcing is **weak**, leaving room for **mesoscale** drivers (sea-breeze, coastal channelling, drainage). Lower levels (850–925 hPa) keep a **background S–SW 10–18 kt**, shallow but sufficient to **assist** the afternoon breeze along the Istrian coast.

Day's physical key:

- **Sea-breeze S–SSW** driven by **land (Istria)–sea** thermal contrast, with **partial coupling** to the S–SW flow at 100–300 m (↑ mixing ⇒ **+2/3 kt**).

- **Evening baroclinicity** over the Kvarner (land cooling) → **NE/ENE drainage** that **undercuts** the tail of the SSW, creating a **transition zone** between **Porer–Unije**.

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2) Environmental diagnostics (air/thermal profiles, multimodel)

Stability / Convection

- **Thursday: CAPE** modest (**100–400 J/kg** at 45.5N/13.4E and 44.6N/14.0E), **LI 0 to −1** → **weak/conditional** instability: isolated showers only **north of the Gulf** late morning/early afternoon; much less likely along Istria.
- **CIN** present (−20/−50 J/kg) over the sea around midday: suppresses deep development away from the coast.
- **Friday:** profiles turn even **more stable** (LI ≥ 0), negligible CAPE ⇒ **no convection**.

Boundary layer / mixing

- **BLH** rises to **700–1100 m** from 13–17 CEST; improving **thermal index** → **updrafts 2–3 m/s** along the west Istrian coast ⇒ **pump effect** on the SSW.
- **Wind @80 m:** 14–20 kt S–SSW in Rovinj–Porer/Unije sectors; **@10 m** 8–14 kt (gusts 15–18 kt) with good **coupling** where sea is warmer/laminar (**3–8 nm offshore**).
- **Vertical shear 0–300 m: weak–moderate** and aligned (small daytime veer) → **fuller** wind than the day before.

Cloud/humidity

- **Mid/high cloud remnants** over the Gulf in the morning (delay breeze onset by **30–90 min**); **wider clearings** towards **Poreč–Rovinj–Porer** (earlier breeze).
- **Friday** generally **clearer sky**: “textbook” thermal regime.

Waves & current

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- Residual **SSW swell**, **Hs 0.6–1.1 m** (Thu) central/southern Istria; **0.2–0.4 m** in the Gulf.
- **Evening cross-sea** (SSW swell + short **NE** fetch 0.3–0.5 m) between Porer–Unije.
- **Currents** from tables **0.1–0.3 kt**, variable (not decisive).

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3) Cross-check with your hourly wind maps

Maps show:

1. **Light SE** in the Gulf late morning;
2. build-up of **S–SSW** with the most active lobes **off Poreč–Rovinj–Porer** (light-green/yellow → **10–15 kt**) between 13–17 UTC;
3. **Evening easing** and emergence of **NE** flows in Kvarner channels.

This **converges** with profiles & multimodel (limited spread on intensity, larger on **timing ±1–2 h**).

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4) Deterministic forecast with error bands (CEST)

Thursday 11

11:00–13:00 – Start Monfalcone / Gulf exit

- **Dir: 120–160° (SE→SSE)**

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- **Int: 5–8 kt**, **range** 3–10 kt (±2 kt)
- **Sea:** Hs **0.2–0.3 m**; smooth water, low shear
- **Physics note:** mid/high cloud = reduced surface heating ⇒ **delayed breeze**; **centre-Gulf** better than hugging the coastline.

13:00–15:00 – Toward Piran–Novigrad–Poreč

- **Dir: SSE→SSW 150–210°**
- **Int: 8–12 kt** (gust **13–15 kt 2–5 nm off**), **range** 6–14 kt
- **Why:** BLH ↑ + alignment with SSW at 80 m; small convergences near headlands ⇒ **20–30° shifts** and **5–7 kt lulls** nearshore.

15:00–18:30 – Poreč→Rovinj→Porer (prime window)

- **Dir: SSW 190–220°**
- **Int: 10–14 kt**, **peaks 15–17 kt** over **Rovinj–Porer** (±2 kt)
- **Sea:** Hs **0.6–1.2 m** from SSW, 3–5 s period
- **Why precisely there: coast–sea thermal barrier + coastline curvature ⇒ coastal jet** with excellent mixing (80 m winds **16–20 kt**).

18:30–22:30 – Porer→Unije / Kvarner entrance

- **Dir: SSW 200–220° easing and backing to S–SSE 160–190°**; then **first NE/ENE 040–070° tongues** on the E Kvarner side after sunset
- **Int: 11→7 kt** (SSW) ⇒ then **NE/ENE 6–10 kt**; **dead band 3–6 kt** in the **Porer–Unije shear/undercut zone**
- **Sea: cross-sea** 2–4 h (SSW 0.6–1.0 m + short **NE** 0.3–0.5 m)
- **Mechanism: Velebit drainage** (radiative cooling) + **baroclinic** coastal set-up ⇒ local **thermal bora**.

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Thursday confidence

- **11–15: Medium** (breeze onset timing ±1 h, intensity ±3 kt)
- **15–19: Medium–High** (pattern robust across datasets)
- **19–24: Medium** (location/timing of SSW→NE transition **±10–15 nm / ±1–2 h**)

Friday 12

00:00–06:00 – Kvarner and back north

- **E Kvarner (lee of Velebit): NE/ENE 8–12 kt**, **gusts 14–16 kt** in valley “tongues”; short-sea Hs **0.3–0.5 m**.
- **W Kvarner / back to Porer:** more patchy **3–7 kt** until ~02–03, then **ENE 6–9 kt** spreading.
- **North of Rovinj: variable 2–5 kt**, local E–SE pre-dawn.

08:00–12:00 – Relaxation + pre-breeze

- **Dir: E→SE** 70–140° (**4–8 kt**); earlier south of Istria, later in the Gulf.

12:00–18:00 – “Clean” thermal

- **West Istria → Porer → toward Unije: S–SSW 8–12 kt**, **peaks 13–15 kt** in the usual jets (Rovinj–Porer / W side of Unije).
- **Gulf of Trieste: S 6–9 kt** (onset delayed if mid/high clouds linger).
- **Confidence: High** (range ±2–3 kt; stable direction).

19:00–24:00 – Evening decay

- **General easing** to **E–SE 4–7 kt** nearshore; **lulls** offshore.

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- **Sea** subsiding (Hs **0.2–0.5 m**).

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5) Where and why the wind can be stronger / weaker

↑ Stronger (+2/3 kt or peaks 15–17)

- **Early clearings (10–11)** in the Gulf ⇒ earlier breeze onset.
- **Coupling** 10–80 m (aligned SSW profiles) **3–8 nm offshore** and where the **coastline curves** (**Rovinj–Porer**, **W** flank of **Unije**).
- **Evening NE channelling** in Kvarner (tongues leeward of Velebit passes).

↓ Weaker (−2/4 kt or 1–2 h delay)

- **Persistent mid/high cloud** past 13:00 in the Gulf.
- **Earlier NE arrival** (18–19) between Porer–Unije → **cuts** the SSW.
- **Recirculation/shadow** under the coast (headlands, bays) and **cross-sea** (reduces coupling and VMG).

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6) Scenario probabilities (11 Sep)

1. **Base – 65%**
   Start **SE 5–8 kt** → **SSW 10–14 kt** (**15–17 kt** Rovinj–Porer) 15–19 → evening **NE 6–10 kt** in Kvarner with a **3–6 kt dead band** between **Porer–Unije**.

2. **“Full” SSW – 20%**
   Early clearings, strong coupling: **SSW 12–16 kt** extending until 20–21 even toward

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Unije; **NE delayed** beyond 22–23.

3. **Early NE – 15%**
   Strong drainage/dry air off Velebit by 18–19: **SSW cut** south of Porer, **sea-breeze front** climbing toward Rovinj; large **2–6 kt variable zone** straddling the track for 1–3 h.

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7) Risk matrix (11–12)

Risk	Prob.	Impact	Detail / Mitigation
SSW→NE transition zone Porer–Unije	High	High	Track **dark water tongues from NE**; pre-empt **bearing right** as true angle improves.
Evening cross-sea	Med	Med	VMG: sail **power mode**; avoid over-canvassing in short chop.
Near-coast holes along Istria	High	Med	Stay **3–6 nm off**; avoid bays/headlands with recirculation.
Isolated showers N Gulf (11–13)	Low	Med	If outflow, rapid **30–60° veer** and **+5/8 kt** for 10–30′; do **not chase** cells.

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8) Live observables (decision triggers)

- **Mid-level cloud** over the Gulf at 10–11: if it **opens**, breeze **starts** within ≤60′; if it stays solid ⇒ **delay** & light start.
- **Surface texture lines: SSW jet** shows as a darker, continuous band **parallel to the coast** between Poreč–Rovinj–Porer.
- **First NE cat's-paws** on the E Kvarner edge after sunset: small **triangular** ripples descending valleys → imminent **SSW cut**.

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- **Flags/buoys:** >30° difference between **10 m and 80 m** = **poor coupling** (expect holes); <20° = **good mixing** (push harder).

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9) Route playbook (cockpit summary)

- **Start 11:00: centre-Gulf lane**, SE 5–8 kt; avoid intricate shoreline effects.
- **13–15 (toward Poreč):** stay **2–5 nm off**, hunt the **outer edge** of the thermal.
- **15–19 (Rovinj–Porer): power mode** in SSW 12–16 kt, Hs 0.6–1.2 m; VMG with a slightly **freer angle** to avoid stalling in short chop.
- **After 19 (Porer→Unije):** read **NE tongues**; when the **cut** appears, **accept leeway to starboard** and seek new E-side pressure instead of sitting in the central lull.
- **Night/Fri morning Kvarner:** exploit **NE corridors** leeward of passes; elsewhere keep a **conservative track** (patchy wind).
- **Fri afternoon: SSW 8–12 kt** (13–15 in jets) returns; repeat Thursday's scheme with **greater regularity**.

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10) Confidence (by variable & window)

- **Direction 11 Sep 13–19: High** (SSE→SSW). **Intensity: Med–High** (±2–3 kt).
- **Evening transition 11 Sep: Medium** (timing ±1–2 h; zone width ±10–15 nm).
- **Daytime regime 12 Sep: High** (well-established thermal pattern).
- **Sea state: Med–High** (evening cross-sea certain; magnitude ±0.2–0.3 m).

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Ultra-technical TL;DR

- **Thu 11:** start **SE 5–8 kt** → **SSW 10–14 kt** (jets **15–17** over **Rovinj–Porer**) 15–19 → **evening cut** with **NE/ENE 6–10 kt** dropping into the **Kvarner**; **3–6 kt dead zone** between **Porer–Unije** (extent/timing variable).

- **Fri 12:** night **NE 8–12 kt** E Kvarner; daytime **SSW 8–12, 13–15 in jets**, evening easing.

- **Mechanism:** mesoscale **sea-breeze + 80 m coupling** by day; evening **NE drainage** off the Velebit.

- **Error bars:** intensity **±2–3 kt**, **timing** (onset/transition) **±1–2 h**.

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