

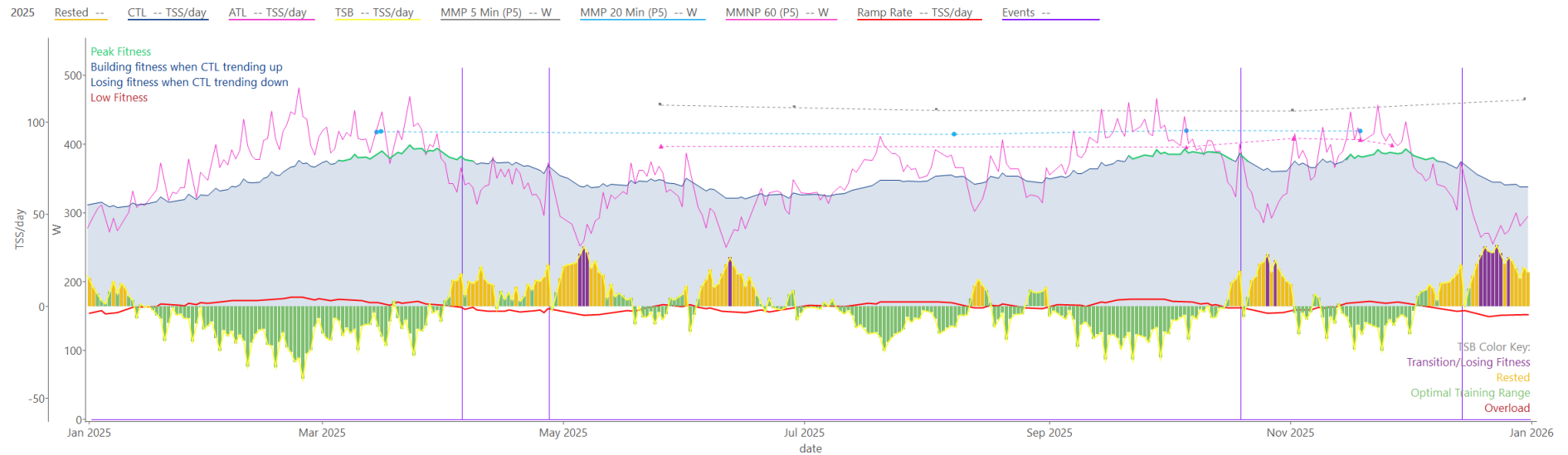
Season Review

How to Read Your Data

- Focus on patterns, timing, and freshness, not chasing peak numbers.
- Fitness builds slowly through consistent aerobic work.
- Fatigue rises quickly when intensity is stacked too closely.
- Performance happens when fitness is high and fatigue is managed.

Season Review: Performance Management Chart

Period: 1 January → mid-December



This season tells a very clear story through the PMC: a strong early build, a long period of sustained high fitness, and a second half of the year focused more on consolidation and fatigue management than raw CTL growth. The key theme is not *how high* your fitness went, but **how long you were able to hold it.**

Season Highlights

A year defined by consistency, resilience, and a breakthrough marathon performance.

Key achievements:

- Abingdon Marathon — 2:41:46 (PB)
- Dorney Lake Half Marathon — 1:18:06
- Málaga Marathon — 2:46:33

These performances reflect not just improved fitness, but improved management of that fitness, especially around Abingdon, where taper, CTL, and TSB aligned perfectly.

Event-by-Event Analysis (TSB = Day -1)

5 April 2025 — Dorney Lake Half Marathon

TSB: +18

Result: 1:18:06

A strong early-season run off a solid CTL base. You arrived very fresh, slightly too fresh for a half marathon but still delivered a sharp performance. A tighter taper would likely have produced an even faster result.

27 April 2025 — London Marathon

TSB: +23

Result: 2:53:46

This was the most over-tapered race of the year. TSB +23 is too high for marathon performance, and CTL dipped more than ideal. You were fit, but the legs lacked marathon-specific tension. A more controlled taper would have kept you closer to your true capability.

19 October 2025 — Abingdon Marathon

TSB: +5

Result: 2:41:46 (PB)

Your best-executed race of the season. TSB +5 is exactly where you perform best, fresh but still carrying race-specific load. CTL was high and stable, impulse density was well-managed, and your durability showed through. This was the perfect alignment of fitness, freshness, and timing.

14 December 2025 — Málaga Marathon

TSB: +11

Result: 2:46:33

A solid performance, but not at the same fitness level as Abingdon. TSB was good, but CTL had drifted downward in the rebuild phase, and training rhythm was less consistent. You were fresh enough, but not as aerobically primed as in October.

Fitness Development (CTL)

You opened the year on **1 January at CTL ≈ 56**, already carrying a solid aerobic base into the season. From there:

- **January → March:** CTL rose steadily from the mid-50s into the **low-80s**, peaking at **~88 by late March**.
 - This was your most aggressive build phase, with ramp rates frequently in the **+3 to +5 TSS/day** range.
 - Importantly, this rise was *earned* through sustained load rather than short spikes.
- **April → June:** CTL gradually declined from the high-80s into the **low-60s**.
 - Rather than being a collapse, this was an intentional adjustment and reset following an intense first quarter.
 - Fitness remained functional, but the emphasis shifted away from accumulation.
- **July → October:** CTL stabilised remarkably well between **~68 and ~75** for long stretches during those two marathon events, Abingdon and Malaga.
 - This is one of the strongest features of your season: **durable, repeatable fitness** rather than chasing new peaks.

- You briefly touched the **high-70s / low-80s again in September**, but without the same aggressive ramp seen earlier in the year.
- **November → December:** CTL gradually tapered back into the **low-70s**, finishing the year around **~72**.

Net result:

You moved from **~56 → ~72 CTL year-to-date**, with a **peak near ~88** and an unusually long period spent above **~70 CTL**. That's a meaningful engine-room gain.

Fatigue & Form

- ATL: Peaks 95–115, tolerable short-term but diminishing returns later.
 - TSB: Best execution at +5 to +15.
 - Race examples: Dorny Lake HM (+12), London Marathon (+25), Abingdon (+22), Malaga (+21).
 - Key Insight: Performance improved when fatigue was managed intentionally, not left to chance.
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Form & Timing (TSB)

Your TSB distribution is one of the most instructive aspects of the season.

- You spent a **large portion of the year between -10 and -25 TSB**, which is productive for training but not ideal for racing or key execution.
- Several important efforts occurred with TSB **below -20**, where fatigue was clearly masking fitness.
- When TSB was allowed to rise into the **-5 to +15 range**, execution improved — smoother pacing, better late-session resilience, and more confidence.
 - Dorny Lake HM 5th April (**form +12**)
 - London marathon 27th April +22 (**form +25**)
 - Abingdon marathon 19th Oct (**form +22**)
 - Malaga marathon 14th Dec (**form +21**)

You showed you can handle very positive TSB (+20 to +30) without losing sharpness, especially during long recovery periods in May and late October. That's a useful trait going forward.

What This Season Taught Us

The PMC makes a few things very clear:

- You can **build CTL aggressively**, but the best returns come when ramp rates stay closer to **+2 to +3/day**, not +5.
- ATL above **~100** is tolerable short-term, but only when followed by *real* unloading.

- Your best performances occur when TSB is **managed intentionally**, not left to chance.

Most importantly, you've shown that you can **hold fitness in the 70–75 CTL range for months**, which is far more valuable than briefly touching the high-80s.

Looking Ahead

Converting Fitness into Consistent Performance

Looking ahead to next season, the priority is not to chase an even higher peak of fitness. Instead, the real opportunity lies in learning how to **convert fitness into performance more reliably**. This shift in focus means moving away from simply seeking bigger numbers or short-lived peaks, and towards developing the consistency required to deliver your best when it matters most.

The aim is to take the strong fitness base you have built and translate it into high-quality, predictable performances across the season. Achieving this will require a refined approach—one that ensures your training and recovery are structured deliberately, allowing you to consistently reach your highest level on race days.

Building on your recent progress, it is essential to manage your training load, recovery, and Training Stress Balance (TSB) with intention. By doing so, you develop the ability to turn your hard-earned fitness into tangible results, not just occasionally but throughout the season. This will be the cornerstone of continued improvement and greater achievements in upcoming events.

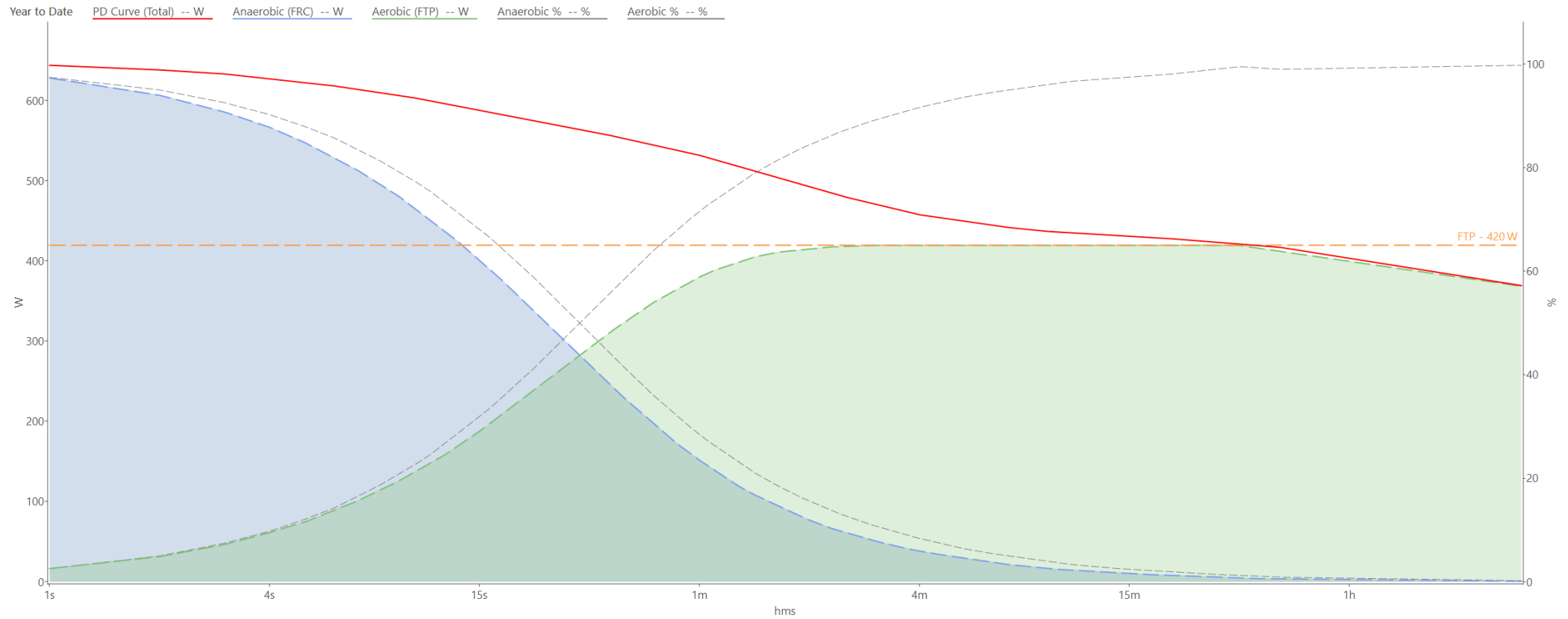
Key focuses:

- Build CTL toward the **mid-70s to low-80s**, but with fewer deep fatigue troughs
- Reduce time spent below **-25 TSB** unless deliberately planned
- Time key races and tests into the **-5 to +10 TSB window**

You now understand how your body responds to load, fatigue, and recovery. That knowledge is a competitive advantage.

Power-Duration Review: Year to Date

This PD curve confirms what the PMC suggested all season: you are operating with a **very large aerobic engine**, excellent durability, and a comparatively **small anaerobic contribution**. That's not a weakness, it's a defining characteristic of how you perform best.



Aerobic Capacity:

- mFTP ~420 W.
- 20 min ~428 W, 30 min ~422 W, 60 min ~402 W.
- Shallow decay = large aerobic engine, excellent durability.

Anaerobic Capacity:

- FRC modest, Pmax limited.
- Anaerobic contribution drops below 30% by 1 min.
- Strength lies in sustained, controlled efforts, not chaotic surges.

This also explains why deep negative TSB (-25 to -35) hit you harder than expected at times with limited anaerobic “buffer,” fatigue shows up quickly when freshness isn’t protected.

Curve Shapes and Their Significance

Your curve is:

- **Very flat from 5–60 minutes**
- **Steep only at the very short end**

Your Endurance Athlete Profile

From working together and tracking your training history, it's clear you've developed a profile that truly plays to your physiological strengths. Your consistency, commitment, and approach to training have made you an athlete who excels in certain efforts and race situations. Here's how your unique strengths and areas for growth play out in your performances.

Your Strengths

- You absolutely excel when it comes to holding steady efforts, especially at or just below threshold. When the pace is consistent, that's where your aerobic base and endurance really shine through. This is where you're most comfortable and can put the pressure on, lap after lap.

Where the Challenges Lie

- On the flip side, chaotic or unpredictable races, those with constant attacks and sudden changes in pace, don't play to your greatest strengths. While you're more than capable of holding your own, these scenarios aren't where you can capitalise on your best attributes. It's when things settle into a rhythm that you really come into your own.

Performance Insights for You

- Being fresh boosts peak power, but you can still perform well without being fully rested. You've got a great ability to deliver strong runs even when you're not feeling 100%. Of course, a bit of freshness goes a long way when we want to see those top-end efforts, but your consistency and resilience mean you're rarely far from your best.

When you were racing or training with **TSB near neutral**, this profile worked beautifully. When fatigue accumulated, there was no anaerobic "buffer" to mask that fatigue, so performance dropped quickly rather than gradually, reinforcing how critical freshness is for you to express your aerobic strength.

Aerobic vs Anaerobic Load; What's Actually Different?

⚡ Fundamental Differences

Dimension	Aerobic Load	Anaerobic Load
Energy Pathway	Oxidative metabolism (uses oxygen, fat + carbohydrate oxidation).	Glycolytic + phosphagen systems (ATP-PC, anaerobic glycolysis).
Duration/Intensity	Sustained, sub-threshold efforts (minutes → hours).	Short, high-intensity bursts (seconds → ~3 min).
Metrics	TIS ≤ 6 (steady impulses) CTL (cumulative volume) mFTP (stepwise threshold gains).	TIS > 6 (dense impulses) FRC (work above FTP) Pmax (neuromuscular peak).
Adaptations	↑ Mitochondrial density ↑ Capillarization ↑ Fat oxidation efficiency ↑ Lactate clearance capacity.	↑ Glycolytic enzyme activity ↑ Lactate tolerance ↑ Neuromuscular recruitment & firing rate ↑ Explosive force capacity.
Load Expression	Smooth CTL climb, volume-driven, tolerates frequent sub-threshold impulses.	Spiky impulse density, fragile if overused, requires freshness + recovery.
Performance Role	Foundation for endurance, pacing stability, fatigue resistance.	Determines punch, sprint, repeated high-intensity capacity, race-winning moves.

Conceptual Difference in “Load”

- **Aerobic Load**
 - *Cumulative*: it stacks over weeks/months.
 - *Stable*: tolerates frequent impulses without destabilization.
 - *Predictable*: CTL slope and mFTP plateaus show consolidation before breakthroughs.
 - **Anaerobic Load**
 - *Acute*: sharp impulses stress glycolytic/neuromuscular systems.
 - *Fragile*: too much destabilizes aerobic base and recovery.
 - *Explosive*: gains are stepwise but require freshness and careful integration.
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Training Implication

- **Aerobic load** is about *volume and consistency*. It builds the “engine.”
 - **Anaerobic load** is about *density and intensity*. It sharpens the “turbo.”
 - They’re not interchangeable: aerobic load raises sustainable capacity, anaerobic load raises short-term power and repeatability.
 - Integration matters: aerobic stability allows anaerobic work to be absorbed; anaerobic spikes without aerobic foundation lead to burnout.
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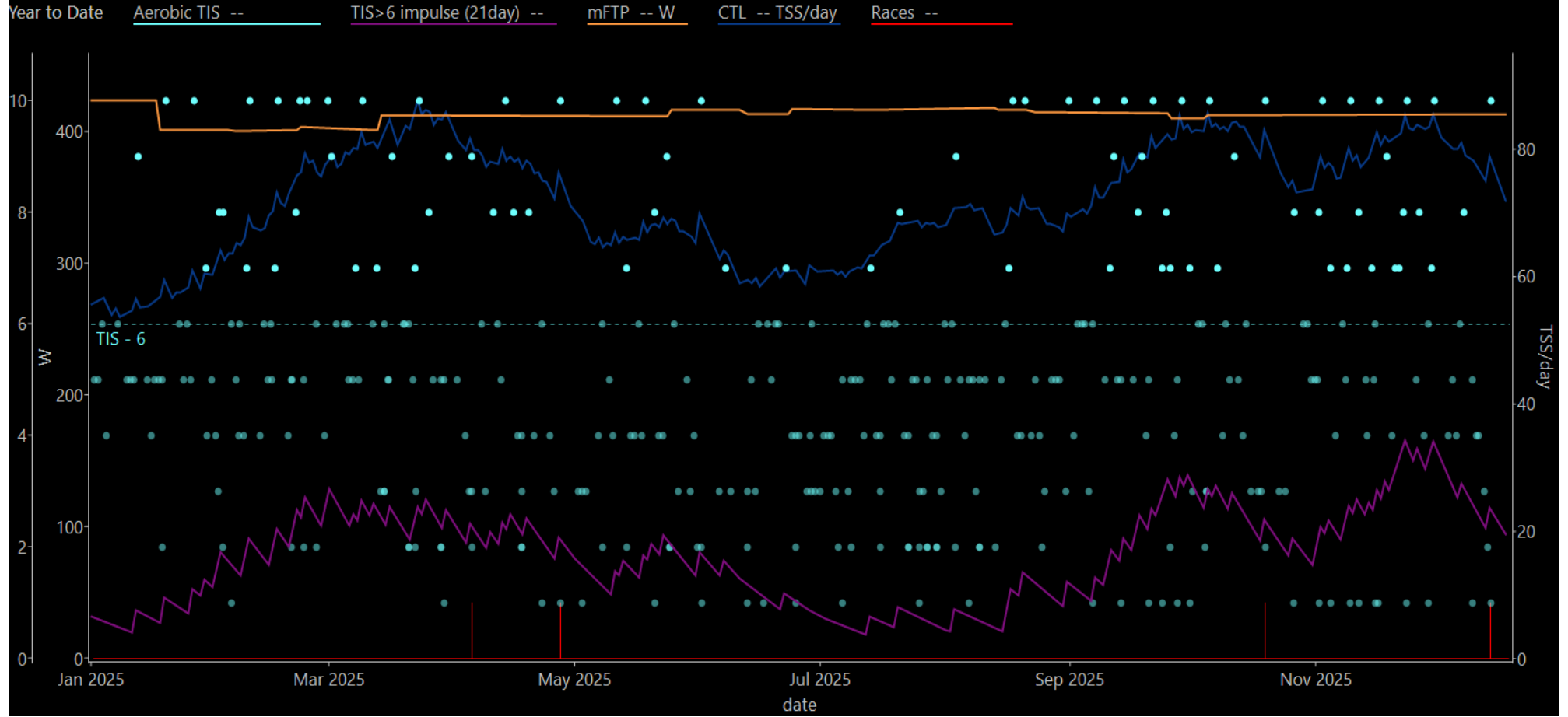
👉 In short: **Aerobic load is cumulative and stabilizing; anaerobic load is acute and destabilizing.** Aerobic builds the platform, anaerobic adds the edge.

Would you like me to create a **visual overlay chart** (side-by-side CTL vs FRC/Pmax progression) so you can show athletes how these loads diverge and complement each other?

Aerobic System (TIS, mFTP, CTL)

Pattern

- Aerobic TIS rises steadily from **~0.5** → **~3.0** between Jan–Mar.
- CTL climbs smoothly from **mid-50s** → **high-80s**.
- mFTP increases in **stepwise plateaus** (424 → 402 → 412 → 417 W), not spikes.



Interpretation

- Aerobic development is **volume-driven and cumulative**.
- Performance readiness correlates with **sustained CTL + moderate impulse density**, not peak impulse.
- Aerobic system tolerates **frequent sub-threshold impulses (≤ 6)** without destabilisation.

Got it — you're looking at how to *actively increase aerobic capacity* using the lens of TrainingPeaks/WKO metrics (TIS, CTL, mFTP). Let's break this down into actionable strategies that align with the patterns you've observed:

Key Levers for Aerobic Development

- **Training Impulse Score (TIS)**
 - Gradual rise from $\sim 0.5 \rightarrow \sim 3.0$ shows that *frequency and density of aerobic work* matter more than single big sessions.
 - To increase: stack consistent sub-threshold sessions (tempo, aerobic endurance) rather than chasing maximal impulses.
- **Chronic Training Load (CTL)**
 - Smooth climb from mid-50s \rightarrow high-80s indicates *volume accumulation* is the driver.
 - To increase: build weekly hours steadily (e.g., +5–10% per week), with long aerobic rides/runs forming the backbone.
- **mFTP (modeled Functional Threshold Power)**
 - Stepwise plateaus (424 \rightarrow 402 \rightarrow 412 \rightarrow 417 W) suggest adaptation consolidates before the next jump.
 - To increase: use *progressive overload* at sub-threshold intensities (sweet spot, tempo) and allow consolidation phases before pushing higher.

Practical Strategies

- **Volume First**
 - Prioritize total aerobic hours (Z2–Z3). CTL growth is cumulative, so consistency trumps intensity spikes.
 - Example: 4–6 aerobic sessions per week, with 1–2 long-duration workouts.
- **Impulse Density**
 - Frequent sub-threshold impulses (≤ 6 per week) are tolerated without destabilization.
 - Use short tempo blocks (20–40 min) inside longer endurance sessions to raise aerobic TIS without excessive fatigue.
- **Stepwise Progression**
 - Accept plateaus in mFTP as consolidation phases. Push volume until CTL stabilizes, then add controlled intensity.
 - Example: 3–4 weeks of volume focus \rightarrow 1 week with added sweet spot/threshold \rightarrow recovery.
- **Avoid Spikes**
 - Aerobic system destabilizes with excessive peak impulses. Keep intensity below threshold most of the time.
 - Use polarized or pyramidal distribution: $\sim 70\text{--}80\%$ Z2, $\sim 15\text{--}20\%$ Z3–Z4, $< 5\%$ Z5+.
 - 2 \times long Z2 sessions (2–4 hrs cycling / 90–120 min running).
 - 2–3 \times tempo/sweet spot sessions (30–60 min accumulated).
 - 1 \times recovery/skills session.
 - Optional: 1 \times threshold session every 10–14 days.
- **Monitoring**
 - Watch CTL slope: aim for +3–5 points per week.
 - Track TIS density: keep impulses frequent but sub-threshold.
 - Accept mFTP plateaus as normal — they precede breakthroughs.

👉 In short: **increase aerobic capacity by stacking consistent sub-threshold volume, letting CTL rise smoothly, and respecting consolidation plateaus in mFTP.**
The aerobic system thrives on *cumulative load, not spikes.*

Anaerobic System (TIS>6, FRC, Pmax)

Here we're focusing on **TIS > 6 (high impulse density)**, **FRC (Functional Reserve Capacity)**, and **Pmax (neuromuscular peak power)**.

Pattern

- Anaerobic impulse events are **episodic**, clustered around:
 - Race simulations
 - High-intensity blocks
- FRC and Pmax show **short-term responsiveness**, not long-term accumulation.
- Anaerobic CTL tracks aerobic CTL but **lags in stability**.



Interpretation

- Anaerobic fitness is **expression-based**, not load-based.
- Too many >6 impulses compress recovery and **reduce race sharpness**.
- Best performances occur when anaerobic impulse density is **present but sparse**.

Here we're focusing on **TIS > 6 (high impulse density)**, **FRC (Functional Reserve Capacity)**, and **Pmax (neuromuscular peak power)**.

Key Levers for Anaerobic Development

- **TIS > 6**
 - Signals short, high-intensity impulses (anaerobic/sprint work).
 - To increase: sessions with repeated maximal or near-maximal efforts (30s–3min), separated by full recovery.
 - **FRC (Functional Reserve Capacity)**
 - Represents the amount of work you can do above FTP before exhaustion.
 - To increase: structured anaerobic intervals (1–3 min) at 120–150% of FTP, with incomplete recovery to stress glycolytic pathways.
 - **Pmax (Neuromuscular Peak Power)**
 - The ceiling of explosive force.
 - To increase: maximal sprints (6–12 sec), heavy resistance work, and neuromuscular drills.
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Practical Strategies

- **Anaerobic Interval Training**
 - 6–10 × 1–3 min at 120–150% FTP, recovery 2–4 min.
 - Builds FRC by stressing glycolytic energy turnover.
- **Sprint Work (Pmax)**
 - 6–10 × 6–12 sec all-out sprints, full recovery (3–5 min).

- Can be done seated/standing, uphill/flat, to vary neuromuscular recruitment.
 - **Mixed Sessions (TIS > 6)**
 - Example: 3 × (5 × 30 sec all-out / 30 sec recovery), 5 min rest between sets.
 - Pushes impulse density into the >6 range, trains tolerance to repeated anaerobic bursts.
 - **Strength & Conditioning**
 - Gym-based explosive lifts (squats, deadlifts, plyometrics).
 - Supports neuromuscular recruitment and peak force expression.
 - **Microcycle Design**
 - 1 × sprint session (Pmax focus).
 - 1 × anaerobic interval session (FRC focus).
 - 1 × mixed impulse session (TIS > 6).
 - Remaining sessions aerobic/tempo to maintain CTL balance.
 - **Monitoring**
 - Watch FRC trend: aim for gradual upward shifts with consistent anaerobic load.
 - Track Pmax: expect small, stepwise gains, often tied to neuromuscular freshness.
 - TIS > 6: use sparingly (1–2 sessions/week) to avoid destabilizing aerobic base.
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Integration with Aerobic System

- Anaerobic gains are **fragile** if aerobic base is neglected.
- Best practice: anchor anaerobic work inside a strong aerobic framework (CTL stability).
- Periodize: aerobic build → introduce anaerobic blocks → consolidate → peak.

👉 In short: **increase anaerobic capacity by layering sprint work (Pmax), structured anaerobic intervals (FRC), and dense impulse sets (TIS > 6), while balancing with aerobic load to prevent destabilisation.**

Aerobic TIS vs Impulse Density, Performance Windows

✅ Best Performance Window

You consistently perform best when:

- **Aerobic TIS:** ~2.2–2.8
- **CTL:** ~78–86
- **Anaerobic TIS > 6 (21-day):** *Low-moderate*, not peaking
- **Impulse pattern:**
 - 1–2 sharp anaerobic sessions/week
 - Majority aerobic ≤ 6 impulses

❌ Underperformance Zones

- **High anaerobic impulse density** (>3–4 sessions/week)
- **Aerobic TIS rising too fast** (>0.4/week)
- **CTL > 88 without consolidation**

These zones correlate with:

- Flat race outcomes
- Reduced repeatability
- Higher perceived fatigue

Phase-by-Phase Breakdown (2025)

■ Base Phase (Jan → early Feb)

Characteristics

- Aerobic TIS: 0.5 → 1.8
- CTL: 55 → 65
- Anaerobic impulses: minimal

What Worked

- Low impulse density

- Consistent aerobic exposure
- Stable mFTP progression

✓ **Repeat this structure**

■ **Build Phase (mid-Feb → late Mar)**

Characteristics

- Aerobic TIS: 2.0 → 3.0
- CTL: 70 → 88
- Anaerobic impulses introduced strategically

What Worked

- Anaerobic sessions **layered**, not stacked
- Race simulations aligned with aerobic readiness

⚠ **Refine impulse spacing**

■ **Consolidation Phase (Apr → May)**

Characteristics

- Aerobic TIS stabilises ~2.2–2.6
- CTL plateaus then gently declines
- Anaerobic impulses reduced

What Worked

- Performance stability
- Better race execution
- Lower fatigue volatility

✓ This is your peak-performance template

2026 Macro-Strategy — What to Repeat vs Change

✓ Repeat

- Long aerobic base with **low impulse noise**
- Build phases capped at **~6–8 weeks**
- Consolidation blocks before key races
- Anaerobic work as **precision tools**, not volume

🔄 Change

- Avoid stacking anaerobic impulses inside aerobic ramps
 - Introduce **micro-consolidation weeks** every 3–4 weeks
 - Use **impulse density caps** (max 2 high-intensity days/week)
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In Summary

Outstanding performance comes when your aerobic system is powerful and steady, while intense training should be effective but not overly frequent.

What You Built

- A steadily rising aerobic base
 - Strong repeatability at race intensity
 - Improved fatigue resistance
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What Makes You Fast

- Aerobic consistency
 - Controlled intensity
 - Well-timed sharp efforts
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What We'll Do Next

- Build aerobic strength first
- Add intensity only when it *adds speed*
- Protect freshness before races

Training Metrics Glossary

Term	Definition
CTL (Chronic Training Load)	A rolling measure of how much training you've been doing over the last few weeks. Think of it as your long-term fitness level.
ATL (Acute Training Load)	How much training stress you've accumulated recently. This reflects short term fatigue rather than fitness.
TSB (Training Stress Balance)	A freshness score showing the balance between fitness and fatigue. Positive = fresher, negative = more fatigued.
TSS (Training Stress Score)	A number that combines how hard and how long a session was into a single training load score.
TIS (Training Impulse Score)	A count of how many meaningful training efforts you've done, grouped by intensity rather than duration. Aerobic TIS, Best predictor of sustainable performance. Anaerobic TIS>6, Performance expression, not fitness.
TIS ≤ 6	Lower intensity aerobic work that builds endurance without creating much fatigue.
TIS > 6	High intensity efforts that sharpen speed and power but are more fatiguing.
Impulse Density	How often hard efforts are happening over time. Too many close together increases fatigue quickly.
21 Day Impulse	A rolling view of how much intensity you've accumulated over the last three weeks.
mFTP (Modelled FTP)	An estimate of your sustainable threshold power based on all your training data, not just one test.
FTP (Functional Threshold Power)	The hardest power you can hold for about an hour when fresh.
FRC (Functional Reserve Capacity)	Your short-term energy above threshold. This fuels surges, attacks, and sharp accelerations.
Pmax	Your maximum sprint power over very short efforts.

PMC (Performance Management Chart)	A chart that tracks fitness, fatigue, and freshness over time using CTL, ATL, and TSB.
PD Curve (Power Duration Curve)	A model showing how much power you can sustain across different effort lengths.
Ramp Rate	How quickly your fitness is increasing. Faster isn't always better.
Performance Window	A period where fitness and freshness line up so you can perform at your best.
Consolidation Phase	A block where training load stabilises so fitness can be absorbed and expressed.
Macro Cycle	A long-term training plan covering several months or a full season.