

M C P   S E R V E R

N O   C O D E

C L O U D   H O S T E D

# Breath-Hold Capacity Estimator MCP

Predict your apnea limits and build better training plans.

Breath-Hold Capacity Estimator MCP helps surfers and apnea athletes predict how long they can hold their breath in different conditions. It calculates both motionless static apnea and active dynamic apnea to give you a realistic look at your physiological limits. You can also get custom training advice and track how your training affects your capacity over time.

**A+** Quality Score 100/100

surfing

apnea

physiology

training

fitness



# The connectivity layer between AI and the world's software.

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Vinkius sits between AI and every application. All communication passes through Vinkius Cloud via the Model Context Protocol (MCP) — with governance, observability, and security at every layer.

# Your AI Connections Run Through Vinkius Cloud

The world's largest  
managed MCP catalog

Vinkius is the connectivity layer where AI connects to the software your business already runs. We handle the hosting, the security, the credentials, the uptime — you get agents that actually do things.

We operate the world's largest managed MCP catalog. Major SaaS platforms, CRMs, databases, and cloud providers — running, monitored, production-ready. This MCP server is hosted and maintained by the Vinkius Cloud for AI Agents.

*The agent doesn't manage credentials, doesn't manage uptime, doesn't manage security. Vinkius does.*

— Architecture principle

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## Four Pillars of the Vinkius Runtime

### 01 — Security by design

Credentials stay encrypted at rest via AES-256. The AI agent never touches raw keys — they're injected into a sandboxed V8 isolate at runtime. Actions are logged, and connections have an emergency kill switch.

### 03 — Deterministic observability

Eight immutable metrics per endpoint: request volume, p95 latency, error rate, active connections, cost attribution. A live payload feed logs every tool call with mutation detection.

### 02 — Built on MCP Fusion

This MCP server was built with **MCP Fusion**, the open-source framework (Apache 2.0) that powers the entire Vinkius catalog. Schema-as-firewall strips undeclared fields, compiled PII redaction runs at zero overhead, and cryptographic lockfiles produce git-diffable audit trails.

### 04 — Autonomous operations

Servers are deployed, monitored, and patched autonomously. New capabilities and security patches ship weekly. Zero-downtime deployments ensure continuous availability across all managed MCP servers.

**AES-256**

Encryption at rest

**Ed25519**

PKI vault signatures

**24h TTL**

Ephemeral session keys

**V8 Isolate**

Sandboxed execution

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## One Token. Instant Access.

Every MCP server on Vinkius is accessed through a **Connection Token**. Tokens are generated in the cloud dashboard and produce a unique MCP endpoint URL. Paste this URL into any MCP-compatible client — no SDK required.

A single token can serve **multiple AI clients simultaneously**, or you can issue separate tokens per client for granular access control. Each token tracks its own request count, last activity timestamp, and can be individually enabled or revoked.

**MCP ENDPOINT**`https://edge.vinkius.com/{token}/mcp`

Claude



Cursor



VS Code



Windsurf



Grok



Gemini

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## Security Is the Architecture

Security in Vinkius is not a feature — it's the foundation of the runtime. The gateway enforces multiple independent protection layers between AI agents and third-party APIs.

**01 — Ed25519 PKI Vault**

Every workspace has an Ed25519 Master Key. Session keys are generated ephemerally (24h TTL) and signed by the Master Key. Credentials never leave the vault boundary.

**02 — V8 Isolate Sandboxing**

Tool code runs inside isolated-vm V8 isolates with 64 MB memory caps and per-request timeouts. No filesystem access, no network access except through the SSRF-guarded fetch bridge.

### 03 — SSRF Guard

All outbound HTTP requests are DNS-resolved and validated before execution. Private IP ranges (10.x, 172.16-31.x, 192.168.x, AWS metadata 169.254.x) are blocked at the network layer.

### 05 — Cryptographic Audit Trail

Every request is signed into a SHA-256 hash chain with Ed25519 signatures. Events form a tamper-proof, SIEM-exportable forensic record.

### 04 — DLP & PII Redaction

A ResponseGuard pipeline intercepts every tool response. Configurable redaction patterns strip sensitive fields (emails, SSNs, card numbers) before data reaches the AI agent.

### 06 — Honeypot Trap System

Phantom credentials are injected into isolated environments. If a honeypot is used outside Vinkius infrastructure, the server is quarantined instantly.

## Emergency Kill Switch

EU AI Act Art. 14(1)  
Compliant

The kill switch is an **emergency halt** mechanism — not a simple toggle. When triggered, it executes three actions atomically:

#### 01 — Server deactivated

The MCP server is immediately taken offline across the entire cluster.

#### 02 — All tokens revoked

Every connection token is invalidated. Total lockout — reconnection blocked until new tokens are issued.

#### 03 — WebSocket connections killed

Active connections terminated via Redis pubsub broadcast. Propagates to every runtime node in the cluster.

## Full Visibility. Zero Guesswork.

The Vinkius cloud dashboard includes a full MCP Governance suite — real-time analytics and security controls for production AI operations.

**Control Plane**

KPI dashboard with request volume, latency, success rate, token consumption, and AI-generated operational briefings.

**FinOps**

Cost tracking per tool, payload compression savings, budget optimization signals, and consumption trends.

**Firewall & DLP**

PII redaction activity, sensitive data protection counters, and security event timeline.

**Agent Activity**

Which AI clients are connecting, how often, and what they're doing — real-time session tracking.

**Tool Health**

Slowest and most error-prone tools, with actionable root-cause insights and performance baselines.

**Incident Log**

Error trends, failure rates, status-code breakdowns, and forensic audit trail access.

Get started at [cloud.vinkius.com](https://cloud.vinkius.com) — connect your AI agent in under 60 seconds.

# Breath-Hold Capacity Estimator MCP

4 tools available

Cloud-hosted on Vinkius

This MCP gives you a way to model your physiological limits for breath-holding. Instead of guessing how long you can stay under for a wave or a dive, you can use your specific data to get accurate predictions. It treats static apnea and dynamic apnea as two different things, which is important because moving during a breath-hold changes everything. You can use it to see how your lung capacity, fitness levels, and CO2 tolerance impact your performance. Once you have your baseline, you can use the training tools to get specific drills that target your weaknesses. It's a practical way to turn your physiological data into a structured plan for better apnea performance.

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## Core Capabilities

### 01 — Static Apnea Prediction

Your agent uses this to find out how long you can hold your breath while motionless.

### 02 — Dynamic Apnea Prediction

Your agent uses this to estimate breath-hold times during active movement like surfing.

### 03 — Custom Training Plans

Your agent uses this to suggest specific exercises based on your current capacity.

### 04 — Progress Tracking

Your agent uses this to see how your training is actually improving your stats.

# One Click on Vinkius — From Prompt to Execution

Available at [vinkius.com/en/ai-agent-connect/breath-hold-capacity-estimator](https://vinkius.com/en/ai-agent-connect/breath-hold-capacity-estimator) — connect your AI agent in three steps.

- 01 Connect the MCP to Claude, Cursor, or Windsurf via Vinkius.
- 02 Provide your stats like lung capacity, fitness level, and CO2 tolerance.
- 03 Ask your agent to estimate your static or dynamic apnea limits.
- 04 Request training recommendations based on those estimates.
- 05 Update your stats after training to track your progress.

You connect the MCP to your AI client and start feeding it your physiological data.

## Built For

This MCP is built for people who need to manage their oxygen efficiency and breath-hold limits.

### Surfers

They use the MCP to predict how long they can stay under during a session.

### Apnea Athletes

They use the MCP to model their physiological progress and training needs.

### Freedivers

They use the MCP to differentiate between static and dynamic performance limits.

## What Changes When You Connect

- 01 Differentiates between static and dynamic apnea for more accurate predictions.
- 02 Turns physiological data into actionable training advice.

- 03** Tracks how training impacts your breath-hold capacity over time.
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## Real-World Applications

### Pre-Surf Planning

Estimate your dynamic apnea to know what to expect during a high-intensity surf session.

### Training Optimization

Get specific drills to improve CO2 tolerance when your static capacity outpaces your dynamic capacity.

### Performance Monitoring

Check your training progress to see if your recent drills are actually increasing your limits.

### Baseline Establishment

Use static apnea estimates to set a starting point for your apnea training journey.

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## Patterns to Avoid

### Ignoring movement during apnea

#### ❌ AVOID

You use your static breath-hold time to decide how long you can stay under a wave while surfing.

#### ✓ INSTEAD

Movement changes your oxygen consumption. Use `estimate_dynamic_apnea` to get a realistic prediction for active sessions.

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### Guessing your training needs

#### ❌ AVOID

You keep doing the same CO2 drills because you feel like they are working.

#### ✓ INSTEAD

Your needs change as your body adapts. Use `get_training_recommendations` to get advice based on your actual stats.

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## Neglecting progress data

### ❌ AVOID

You assume you are getting better at apnea because you feel more comfortable underwater.

### ✓ INSTEAD

Subjective feelings can be misleading. Use `analyze_training_progress` to see how your capacity is actually shifting.

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## The Right Fit

Connect this MCP if you need to model physiological limits for surfing or freediving. If you are just curious about breath-holding without a plan to train or track data, you don't need this. The decision depends on whether you want to turn raw physiological stats into a structured training plan.

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# Breath-Hold Capacity Estimator Toolset

These tools translate your physiological data into specific apnea predictions and training adjustments.

| #  | TOOL                         | DESCRIPTION                                                                                                                |
|----|------------------------------|----------------------------------------------------------------------------------------------------------------------------|
| 01 | analyze_training_progress    | This tool evaluates how your recent training sessions have actually changed your estimated breath-hold capacities.         |
| 02 | estimate_dynamic_apnea       | This tool predicts how long you can hold your breath while you are actively moving, like when you are swimming or surfing. |
| 03 | estimate_static_apnea        | This tool calculates your predicted breath-hold duration when you are staying completely still.                            |
| 04 | get_training_recommendations | This tool provides specific training advice based on your current physiological stats and your personal goals.             |

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## See It in Action

Real prompts you can use once this MCP is connected to your AI agent through Vinkius Cloud.

- U** Estimate my static apnea capacity with a lung capacity of 5 liters, moderate fitness, and a CO2 tolerance of 0.8.



Your estimated static apnea time is 145 seconds with a high confidence level.

- U** What training should I do if my static capacity is 120s and my dynamic capacity is 45s, and I want to increase CO2 tolerance?



To increase CO2 tolerance, you should focus on CO2 tables and specialized breath-holding drills to reduce the urge to breathe.

- U** Estimate my dynamic apnea for a high-intensity surf session with 4 liters of lung capacity and elite fitness.



Your estimated dynamic apnea time is 55 seconds.

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## Frequently Asked Questions

**01** How does this MCP differ from a standard fitness tracker?

This MCP focuses specifically on apnea physiology, distinguishing between motionless static holds and active dynamic holds like surfing.

**02** What clients can I use this MCP with?

You can use this with any MCP-compatible client, including Claude, Cursor, Windsurf, and VS Code.

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**03 Can I use this to improve my CO2 tolerance?**

Yes, you can ask your agent for training recommendations specifically designed to increase CO2 tolerance based on your current stats.

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**04 Do I need to host this myself?**

No, Vinkius hosts and manages the MCP for you, so it is ready to use as soon as you connect it.

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**05 How accurate are the apnea predictions?**

The predictions are based on the physiological data you provide, such as lung capacity and fitness levels.

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**06 What is the difference between static and dynamic apnea?**

Static apnea is holding your breath while remaining still, whereas dynamic apnea involves movement like swimming or duck-diving, which consumes oxygen faster.

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**07 How can I improve my training?**

You can use the `get\_training\_recommendations` tool to receive specific exercises based on your current static and dynamic capacities.

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**08 Can I track my progress over time?**

Yes, the `analyze\_training\_progress` tool allows you to evaluate how your training volume has influenced your capacity improvements.

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# Go Live in 60 Seconds

Get your connection token from [cloud.vinkius.com](https://cloud.vinkius.com), then paste the endpoint URL into any MCP-compatible client.

YOUR MCP ENDPOINT

`https://edge.vinkius.com/[TOKEN]/mcp`

| CLIENT                                                                                              | WHERE TO CONFIGURE                                                                                         |
|-----------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------|
|  <b>Claude AI</b>  | Profile → Customize → Connectors → "+" → Add custom connector → Paste endpoint                             |
|  <b>Cursor</b>     | Settings → Features → MCP Servers → "+ Add New MCP Server" → Type: SSE → Paste endpoint                    |
|  <b>VS Code</b>  | Ctrl/Cmd+Shift+P → "MCP: Add Server" → add <code>"breath-hold-capacity-estimator": { "url": "..." }</code> |
|  <b>Windsurf</b> | MCP Settings → <code>mcp_settings.json</code> → Add endpoint URL                                           |
|  <b>ChatGPT</b>  | Settings → Tools & plugins → Add MCP server → Paste endpoint                                               |
|  <b>Gemini</b>   | Extensions → Add MCP Server → Paste endpoint URL                                                           |

ASK AN AI ABOUT THIS

Let your preferred AI explain this MCP server

-  Ask ChatGPT 
-  Ask Claude 
-  Ask Perplexity 
-  Ask Gemini 
-  Ask Grok 

READY TO CONNECT

# Breath-Hold Capacity Estimator is live on Vinkius Cloud.

Get your connection token, paste it into your AI agent, and  
start building. No SDK. No deployment. Just results.

**Start at [cloud.vinkius.com](https://cloud.vinkius.com) →**

[vinkius.com](https://vinkius.com) · [support@vinkius.com](mailto:support@vinkius.com)

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| Endpoint   | <code>https://edge.vinkius.com/{token}/mcp</code> |

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