AI-Hydra:
Turning Soil Moisture Data into Action

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Why AI for Soil Water?

Soil moisture data and hydraulic properties are key to crop growth, irrigation scheduling, and soil physical health.

But soil moisture probe data is difficult to use in practice:

- Expert interpretation is often subjective and inconsistent across soil and crop types
- Manual water threshold settings for irrigation are time-consuming and vary by site
- Most tools can’t forecast soil moisture dynamically while staying true to soil physics

👉 **Clear need for a smarter method AI-Hydra**

What is AI-Hydra?

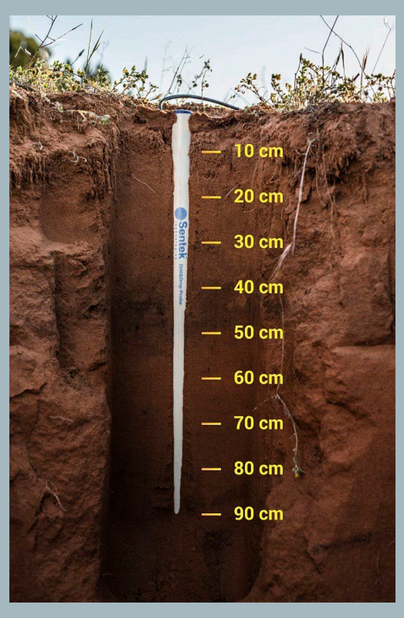
An easy-to-use web system that turns field soil moisture data into useful insights by combining AI models and soil physics.

What’s Inside?

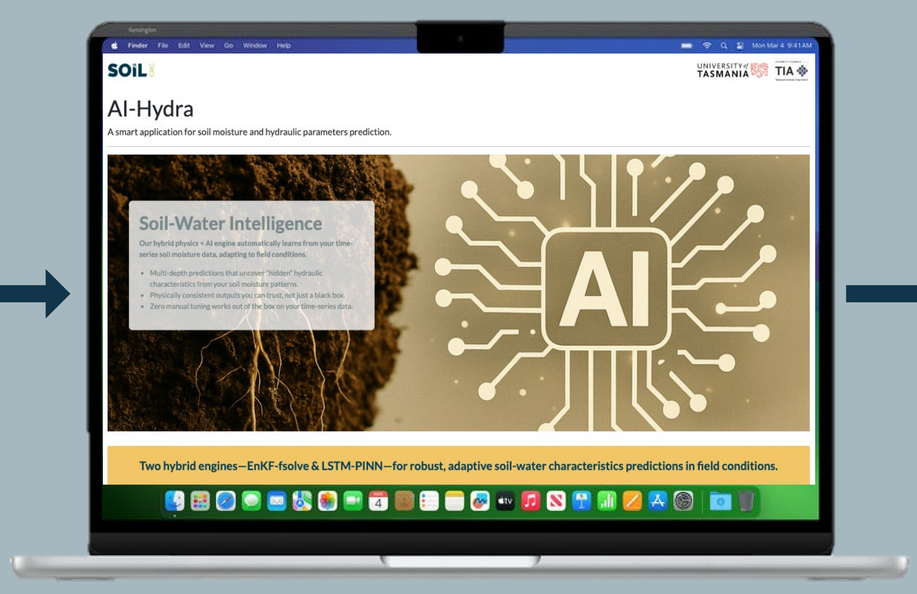
- 📈 **PI-LSTM**: A deep learning model that learns from past data to forecast soil moisture and predict soil water retention
- 🧮 **EnKF-fsolve**: A data assimilation model that simulates how water moves in soil and estimates key properties
- 🌐 **Web Interface**: Upload data, run models, view results and use cases
- 🤖 **AI Assistant**: Explains outputs in plain language

How AI-Hydra Looks & Works?

Field Data
collected by sensor



Modelling
AI-Hydra web platform to run the models



Action Plan
Forecast and irrigation recommendations

🔍 **Explore the platform yourself – Scan to view demo:**

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