EARTHLAB LUXEMBOURG

Teaching Machines to Decide in Space

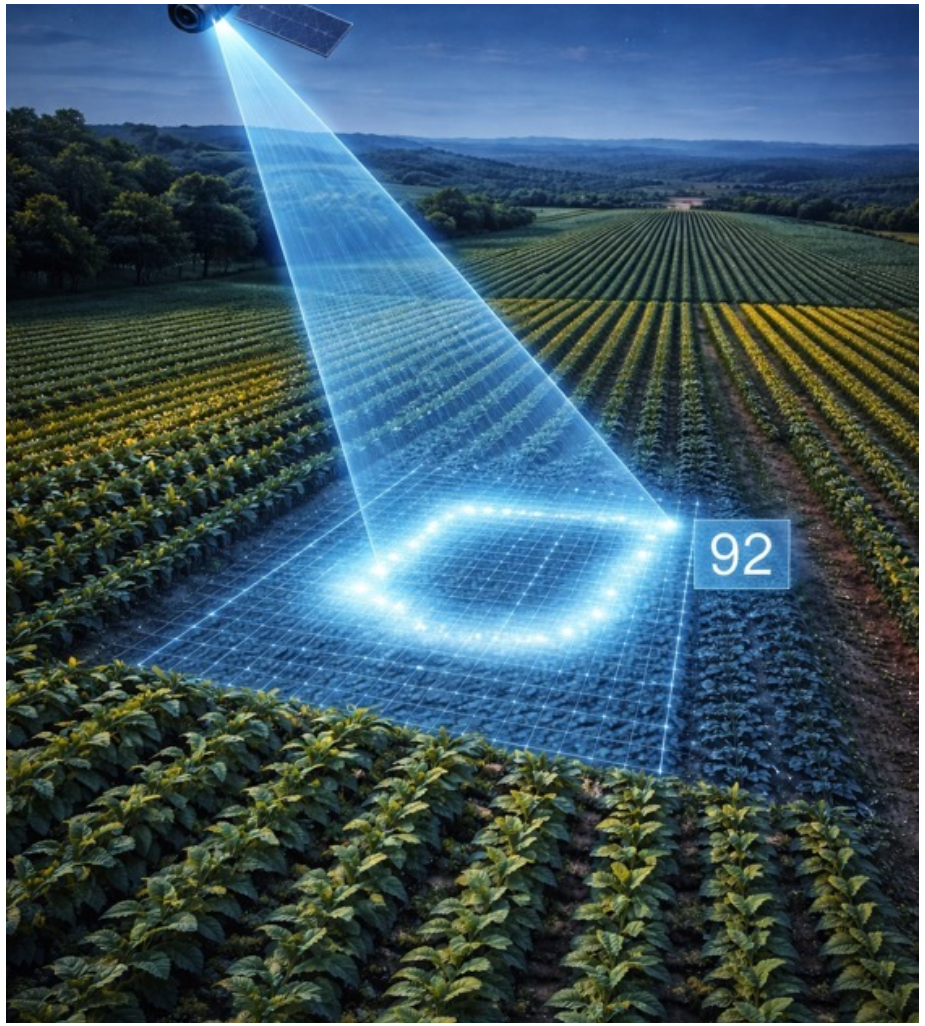
How AI is learning to read our planet, and the people who build it

Switch to Space 2026 · Brussels

Mohamed Boukhebouze - AI Product Manager, EarthLab Luxembourg

Max-ICS | TELESPAZIO a LEONARDO and THALES company

EarthLab Luxembourg: applied EO and AI



Applied EO and AI engineering, from prototype to operations

- **Earth observation**

  Multi-sensor data access, geospatial processing and operational delivery

- **Artificial intelligence**

  Computer vision, model development, evaluation and deployment

- **From applied research to operations**

  Reusable workflows, controlled deployment and domain validation

Max - ICS

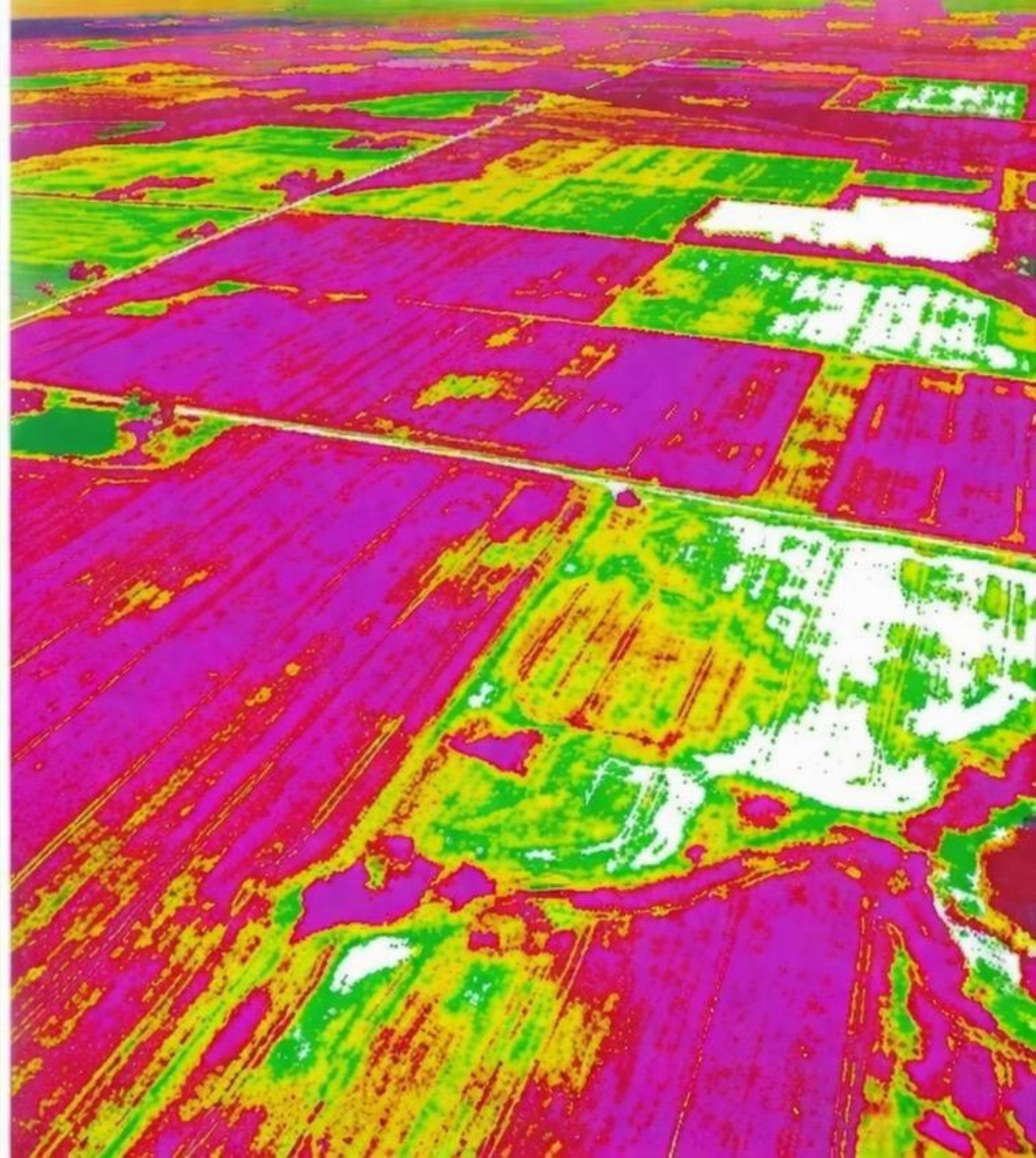
Max-ICS, EarthLab Luxembourg's flagship software platform, transforms EO data into scalable operational services and supports the development of tailored AI applications

EARTH OBSERVATION DATA

Seeing the invisible

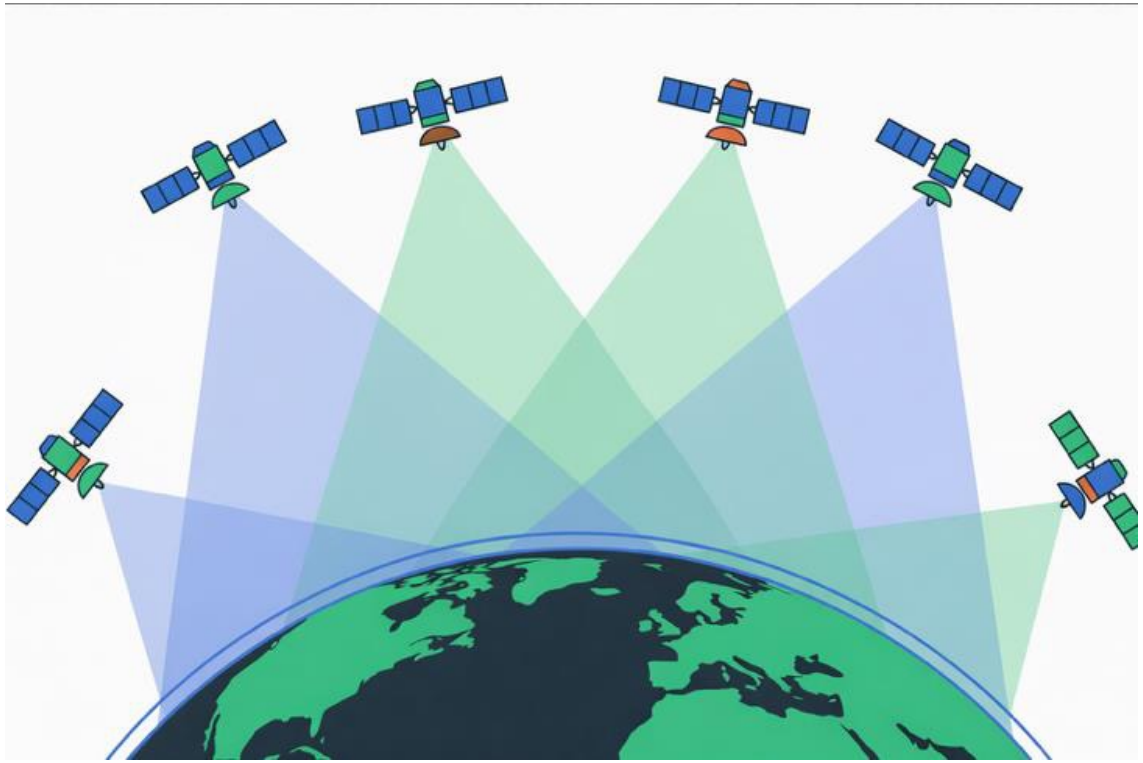
The same field. Left, what our eyes see. Right, what the data reveals:
plant health, soil moisture, water temperature.





THE CHALLENGE

Too much data for human eyes



2.5 TB

of raw data every single day, just from ESA's Sentinel satellites.



> 500 HD movies downloaded every 24 hours

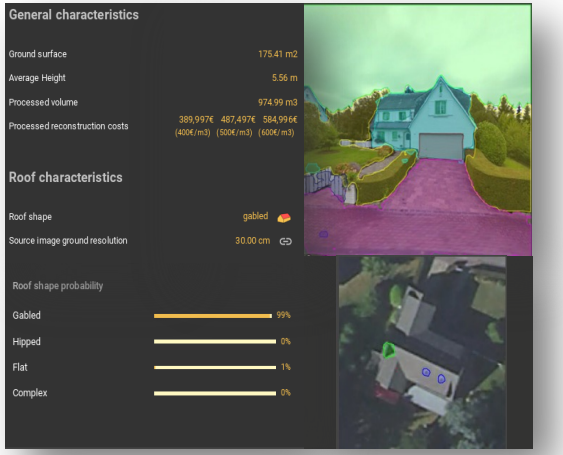


> 1,000,000 iPhone photos captured every day

WHAT WE BUILD AT EARTHLAB

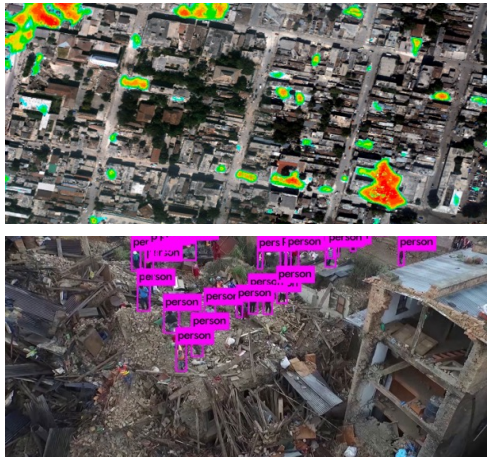
EO and AI, put to work three ways

At EarthLab Luxembourg, the same building blocks, satellite data and validated AI, power very different missions.



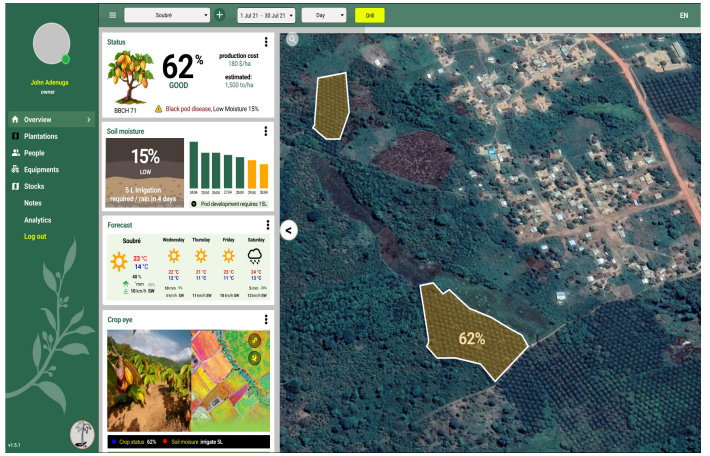
BKC

Building Knowledge Center. We profile a building's energy performance from space, combining EO data and AI, first in Luxembourg.



DroneAI

From field to responders in minutes. After a disaster, AI reads drone and satellite imagery to map damage, access routes and people.



DT4CMI

Digital Twin for Cocoa Moisture Insights. An digital twin of cocoa farms in West Africa, fusing satellite data, IoT sensors and AI to track soil moisture, catch disease early and lift yields

THE ENGINE

Data scientists need an engine. Meet Max-ICS

01	**Data**	catalogues, EO scenes, user data, standard interfaces
02	**Processing**	calibration, tiling, feature extraction, at scale
03	**AI**	training, inference, quality checks, model registry
04	**Outputs**	maps, indicators, APIs and provenance



Max-ICS is our platform to build and run these workflows at scale. Building it takes developers, data engineers and cloud specialists, not only data scientists.

Max-ICS for BKC, the building energy use case

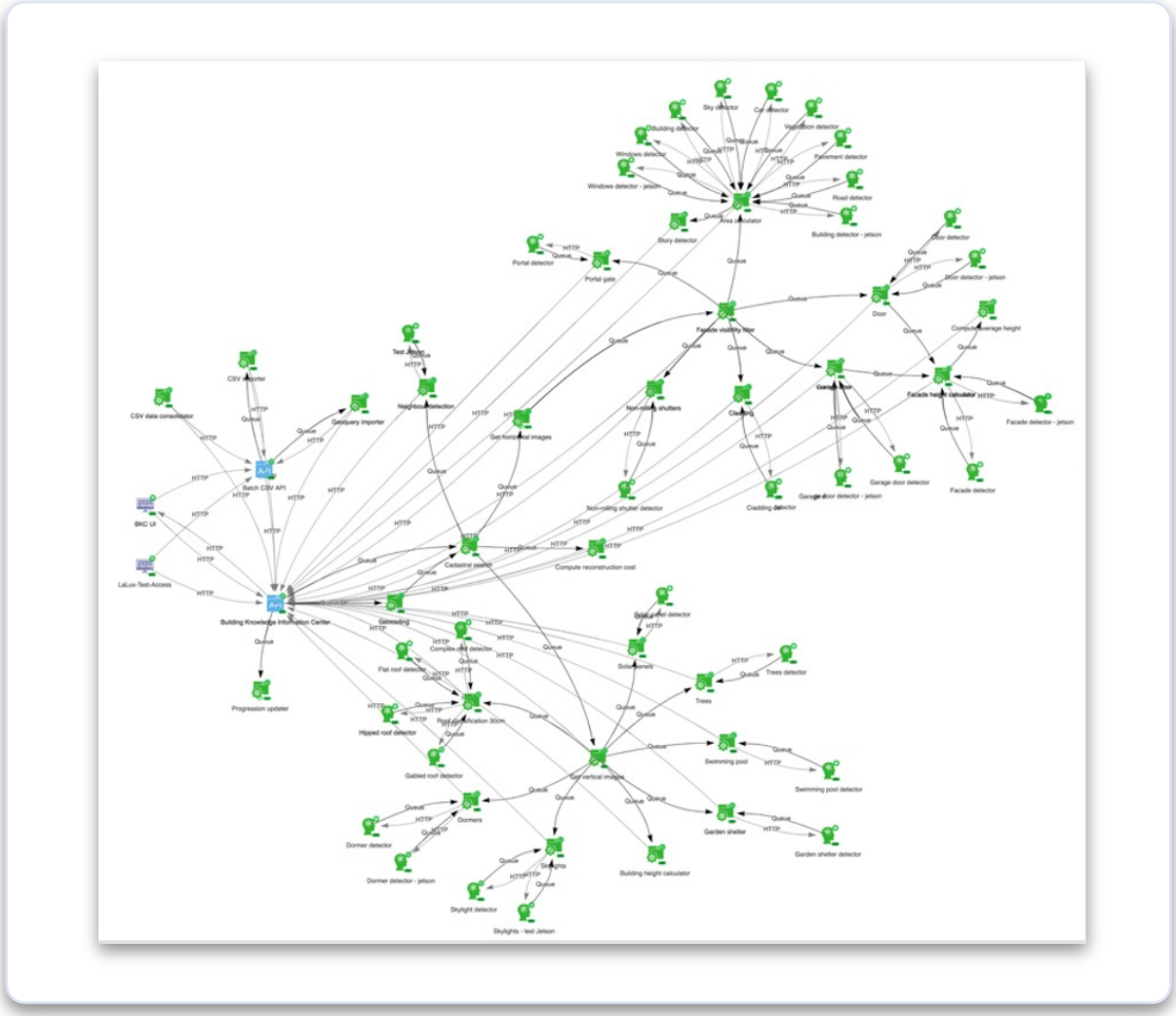
~30
images / building

20+
AI models

< 2 min
per address

30 cm
image resolution





TEO: one horizontal agent for EO data

A ChatGPT for Earth observation

WITHOUT TEO

You need GIS skills and the right tools

Every new question means finding the data, choosing the tools, and hours of manual GIS work.

WITH TEO

You just ask, in plain language

TEO understands your question, fetches the data, runs the right models and gives you the answer. Made for experts and non-experts alike.

WHAT CHANGES

Natural-language entry

A question replaces a pipeline design session

Dynamic plans

Tools and data chosen for each request and context

Adapts to gaps

Missing data or cloudy scenes handled and reported

Faster delivery

From question to file, map or report in one session

WHAT WE KEEP

Validated tools only

Proven algorithms; the agent computes nothing itself

Checks before action

Schema, source, licence and policy verified first

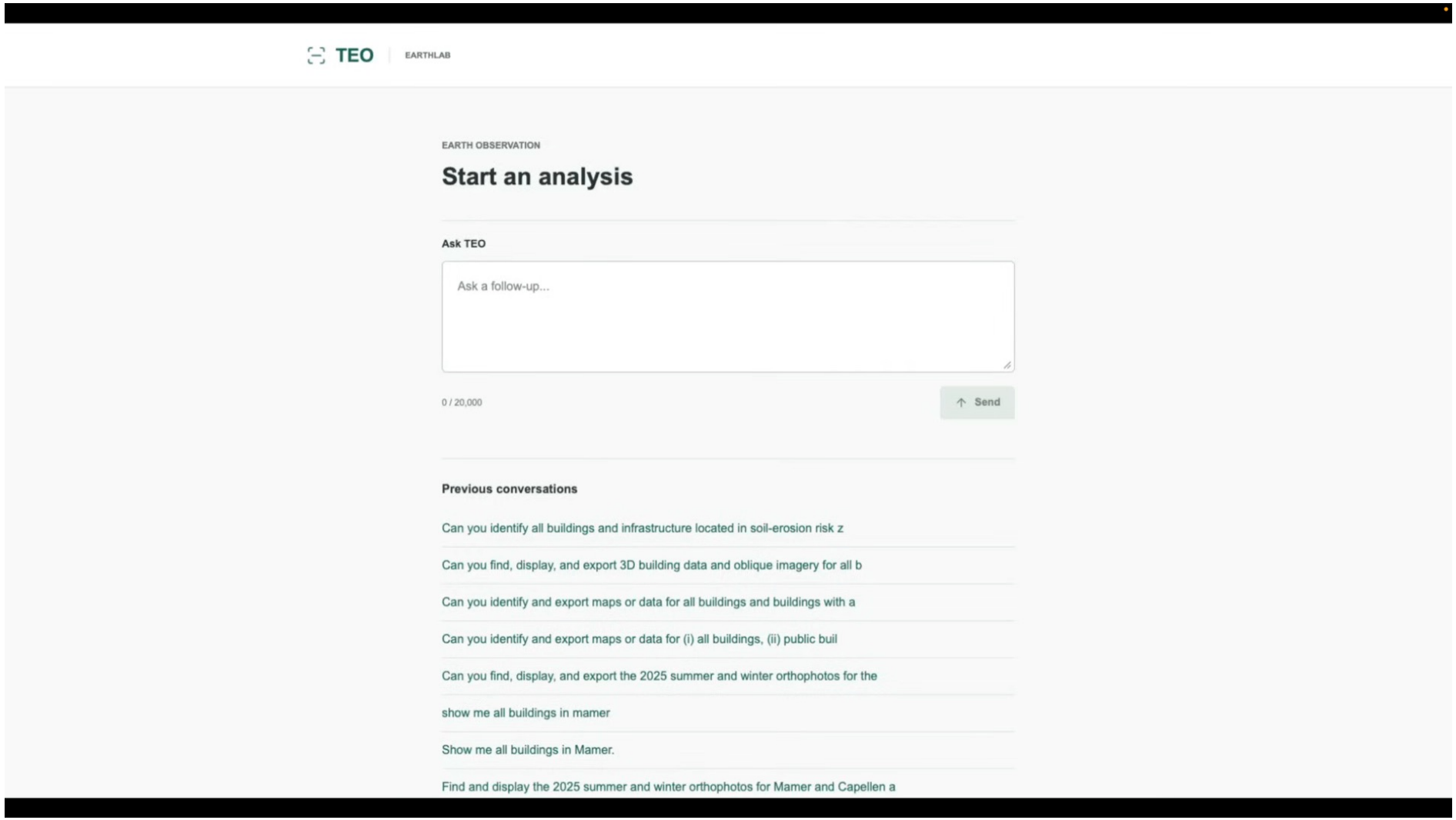
Human approval

The user approves each proposed action

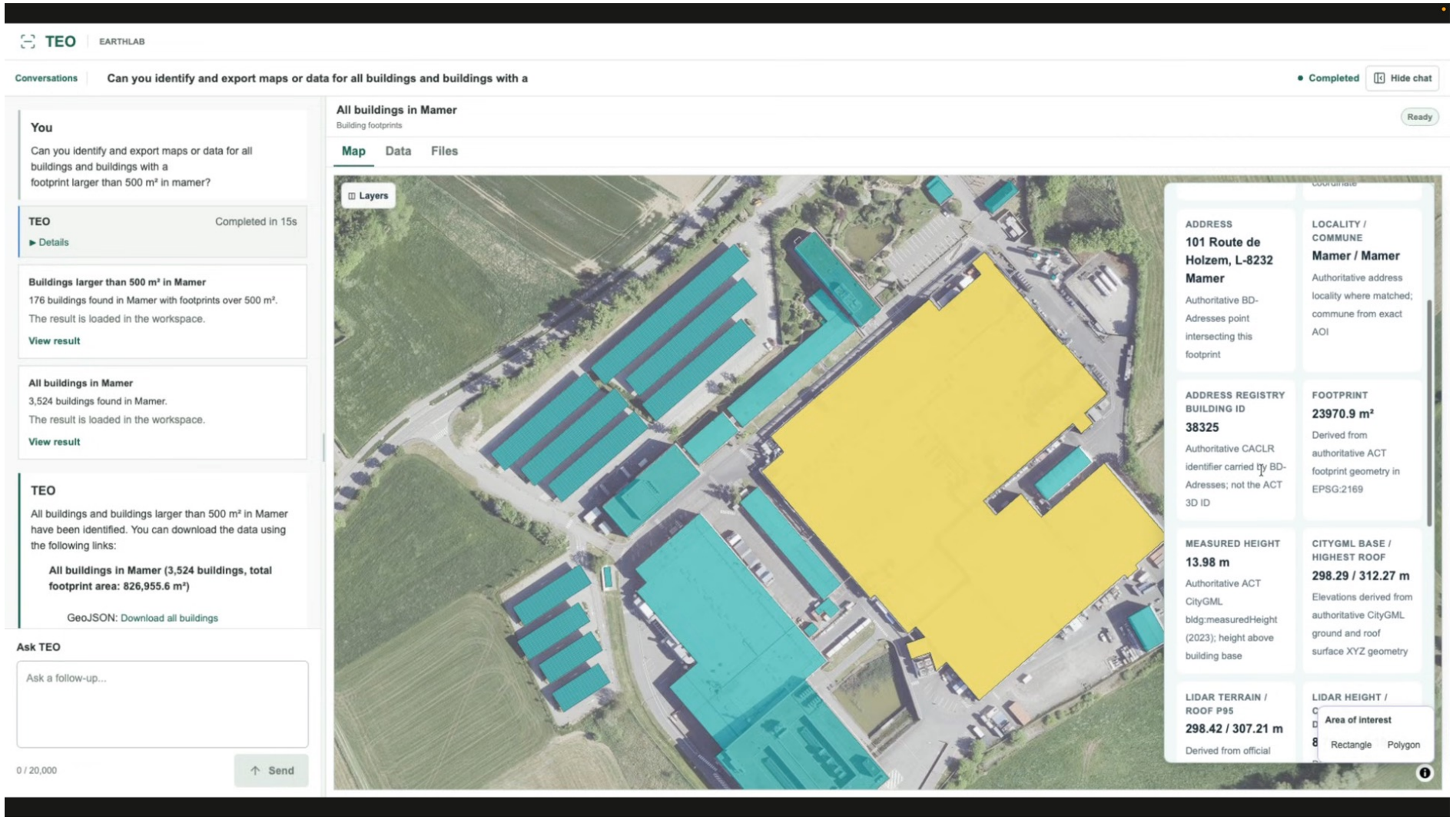
Full trace

Data, parameters, versions and results logged

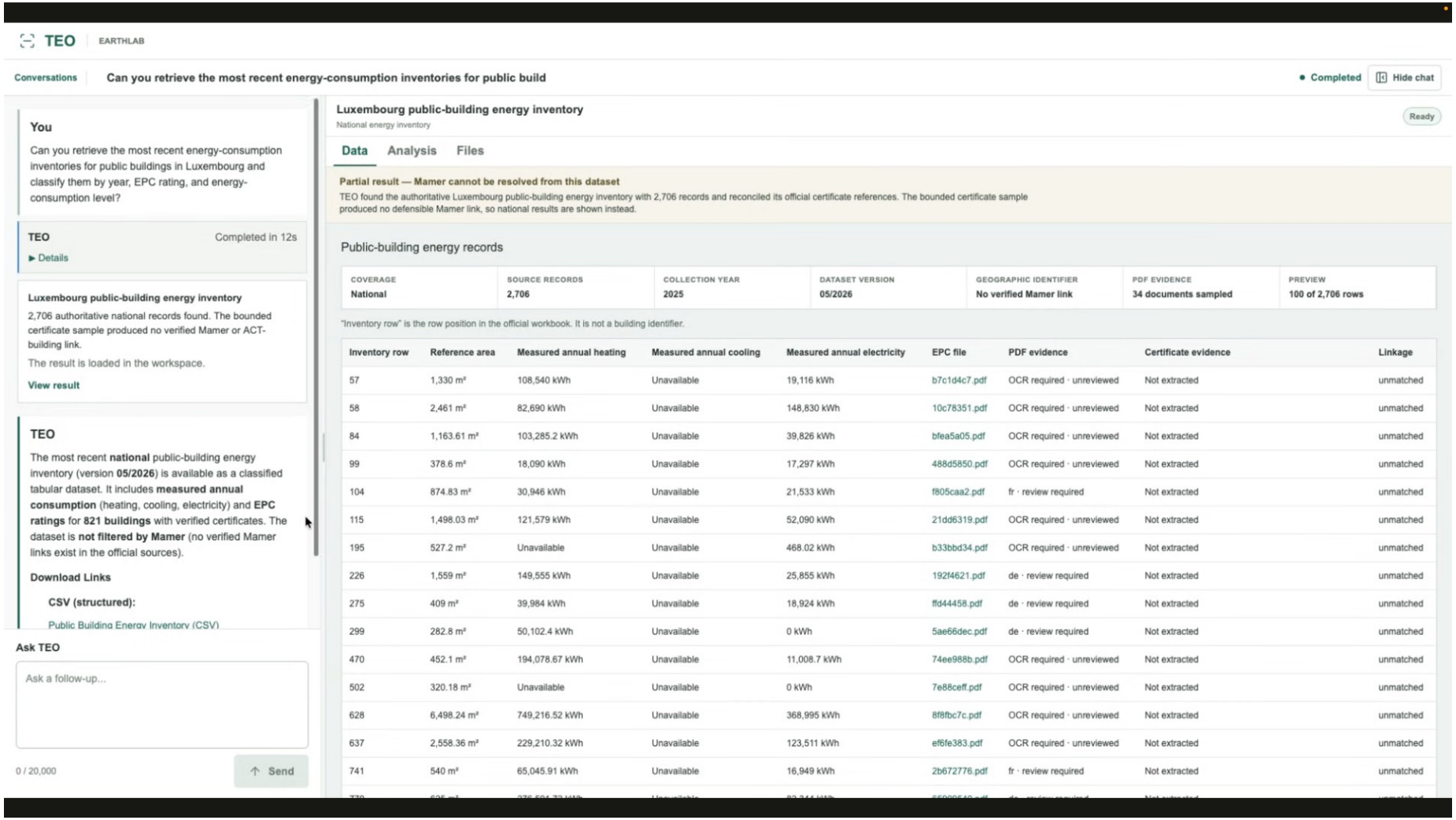
TEO in actions



TEO in actions



TEO in actions



IT TAKES A TEAM

Building Max-ICS and TEO takes many profiles

Space software is a team sport. Behind the platform, a mix of complementary skills:



Data scientists

Train and validate the AI models.



Developers

Build the platform and its interfaces.



AI engineers

Orchestrate the models and agents.



Infra / DevOps

Run it reliably, cloud and on-premise.

and more, as we grow: domain experts, GIS specialists, product. There is a place here for many paths

Conclusion

01

Space is more than satellites

The frontier is the data, and the AI that turns it into decisions.

02

Many paths, one field

Data science, software, AI, GIS and domain expertise: space needs them all.

03

Your place is here

If any of this sparks your curiosity, come and talk to us.

EarthLab Luxembourg is building this, and looking for curious minds. Come say hello!



Thank You for Your Attention

Questions?

EARTHLAB LUXEMBOURG

Max-ICS by EarthLab Luxembourg

Contact Information:

Phone: **+352 621 738 951**

Email: **info@earthlab.lu**

Talk to us about your use case: we can configure a vertical agent around your data and tools.