



AURA, Analytics for Urban Resilience and Adaptation



About WEO

Founded in 2020, our founders were brought together by a shared commitment to take cutting edge research into the world to make a real difference.

"Towards a sustainable future with impactful EO environmental solutions for all"



Imeshi Weerasinghe
CEO

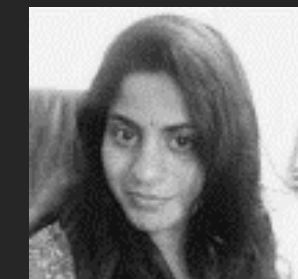
Leads strategic direction of WEO, using her background in the public and private sectors, as well as dual training in international business and economics

WEO has attracted a gender and culturally diverse team of top machine learning engineers, software developers and business experts because of our shared mission and commitment to being an employer of choice.



Dr Charlotte Wirion
CTO

Pioneers WEO's technical direction to ensure our competitive edge, Charlotte is a remote sensing, machine learning and environmental engineering expert.





Bushfires one day, floods the next: why Australia can expect more 'compound events'

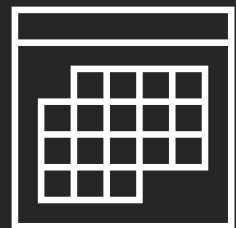




Using AI WEO creates high-resolution insights from OPEN satellite data



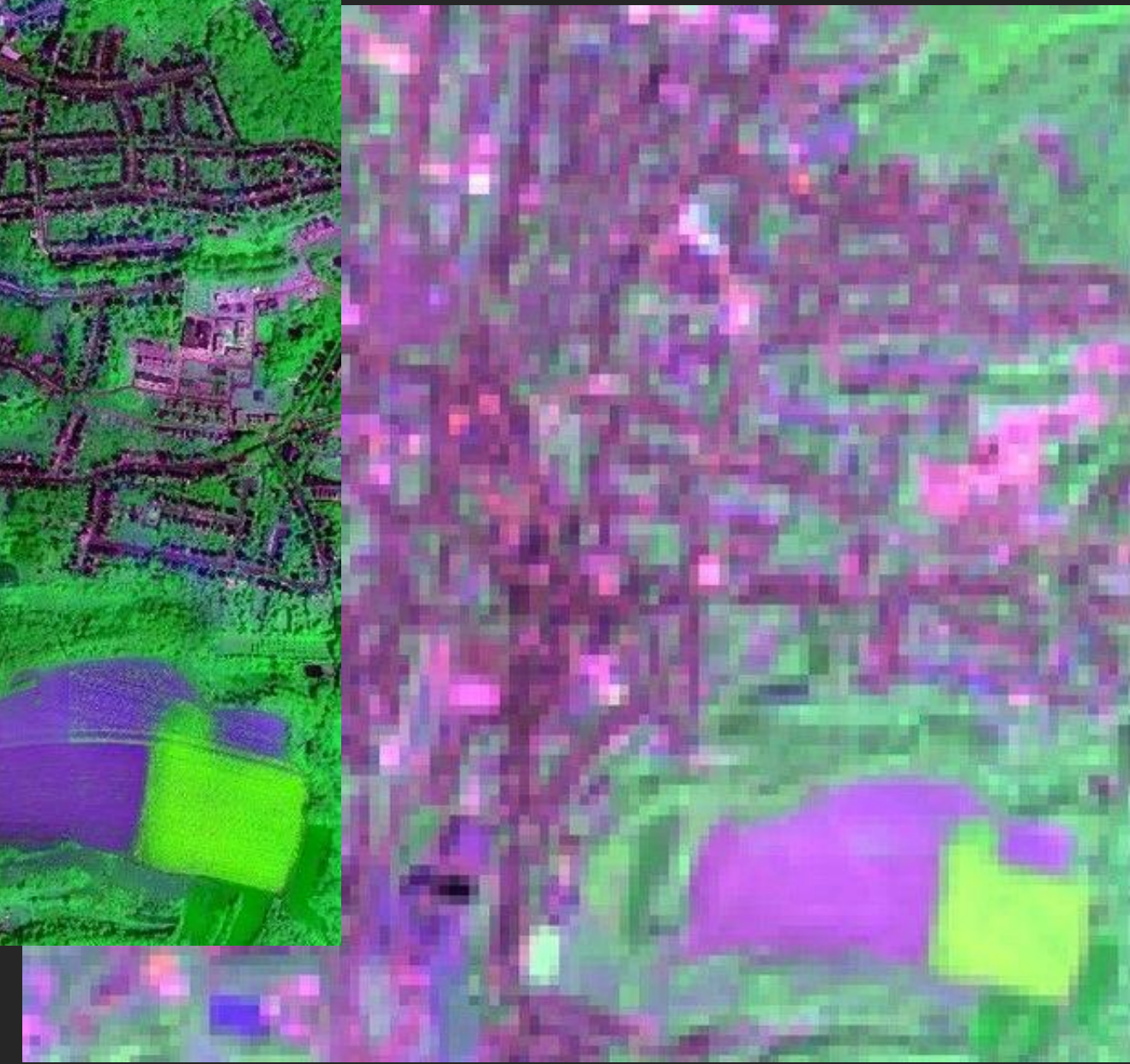
Deep Learning to zoom in to higher resolutions



Seasonal Updates –
not years between
aerial flights



Sentinel Satellite
datasets available
globally



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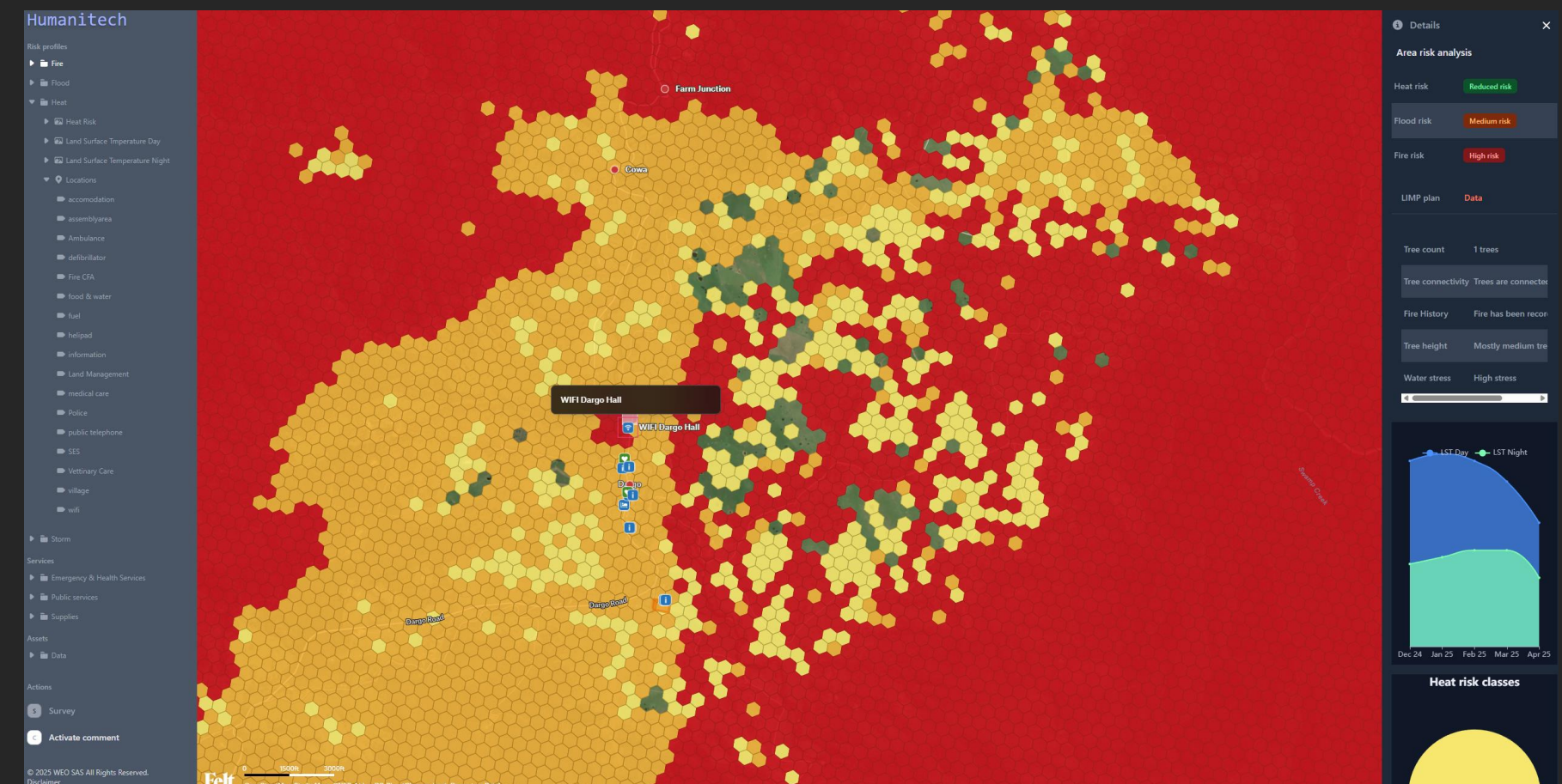
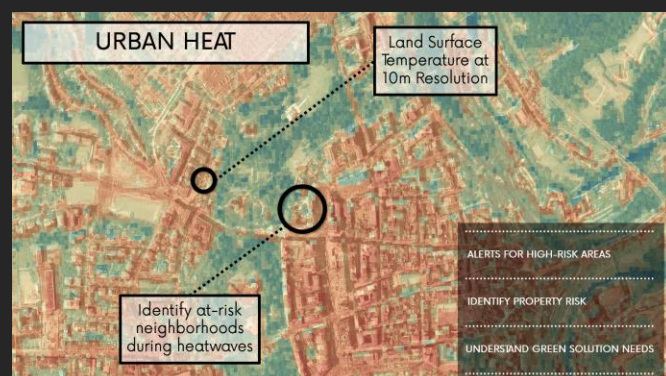
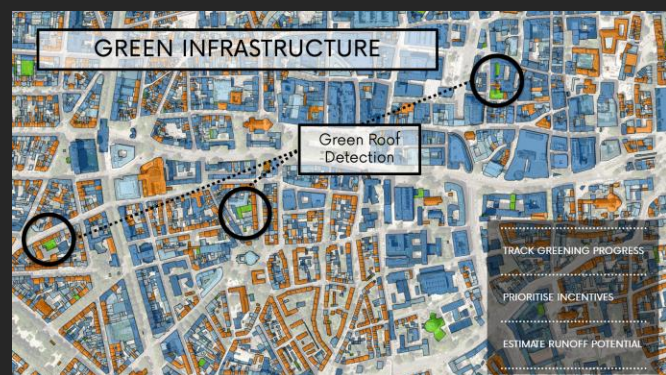
WEO's technology improves the resolution of satellite imagery unlocking valuable insights which were unavailable previously.

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Native
Resolution

10m Resolution
– WEO tech

1m Resolution –
WEO tech +



Key focus areas:

- Urban heat
- Flood & wildfire risk
- Vegetation risk
- Nature-based solutions (NBS)
- Community-based feedback integration

Risk profiles

▸ Fire

▸ Flood

▼ Heat

▼ Heat risk

ⓘ Layer metadata

- No risk
- Low risk
- Medium risk
- High risk

▼ Heat retention risk

ⓘ Layer metadata

- No risk
- Low Risk
- Medium risk
- High risk

▸ Surface temperature day

▼ Surface temperature night

- $\leq 11.83\text{ }^{\circ}\text{C}$
- $11.83\text{ }^{\circ}\text{C}$ to $17.67\text{ }^{\circ}\text{C}$
- $17.67\text{ }^{\circ}\text{C}$ to $23.5\text{ }^{\circ}\text{C}$
- $23.5\text{ }^{\circ}\text{C}$ to $29.33\text{ }^{\circ}\text{C}$
- $29.33\text{ }^{\circ}\text{C}$ to $35.17\text{ }^{\circ}\text{C}$
- $\geq 35.17\text{ }^{\circ}\text{C}$

▸ Surface temperature diff

▸ Locations

▼ Community Data

- Densely populated area at risk
- Reception Areas
- No Reception Areas

▸ Storm

Services

▸ Emergency & Health Services

▸ Public services

▸ Supplies

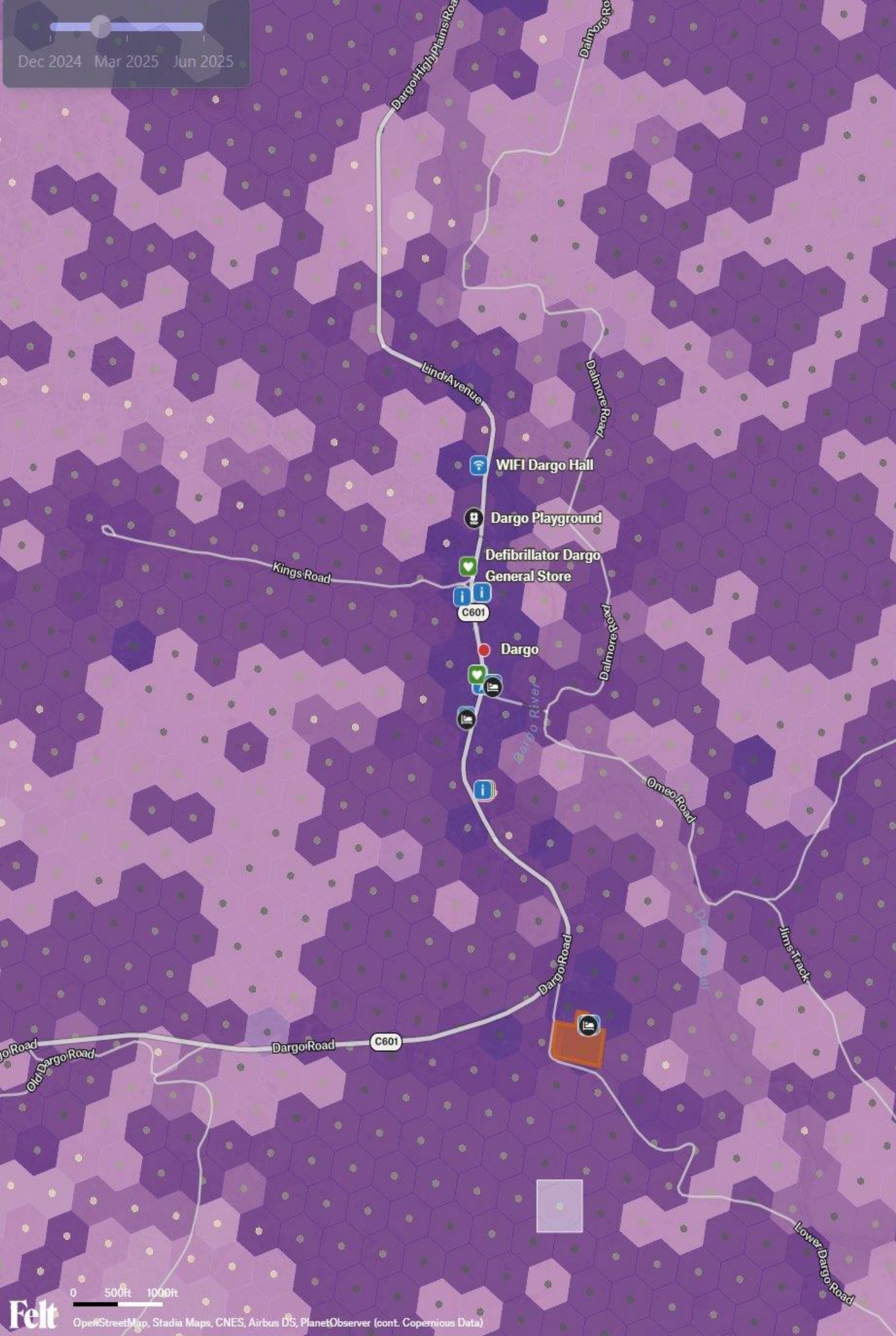
Assets

▸ Data

Actions

S Survey

C Activate comment



Details

Solutions

Risk

Data

Area risk analysis

RISK	SELECTED AREA AND PERIOD [2025-02-01]	ALL TIME AVERAGE	WHOLE ZONE AVERAGE
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Reduced risk

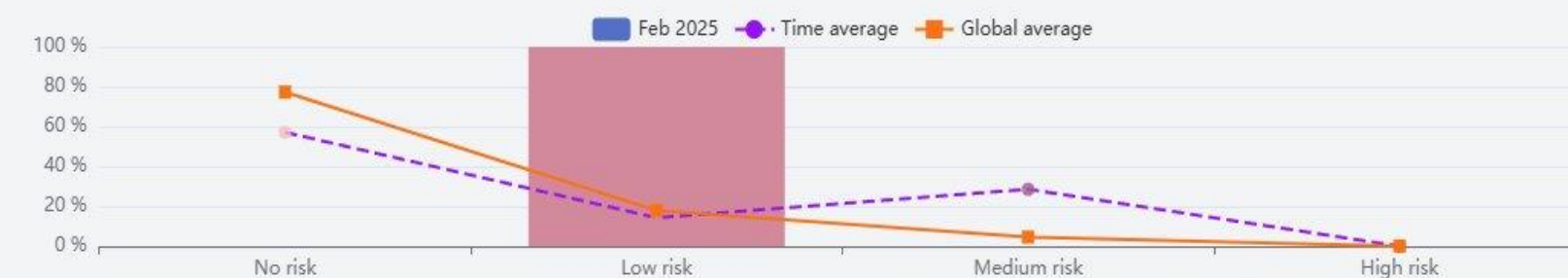
Reduced risk

No risk

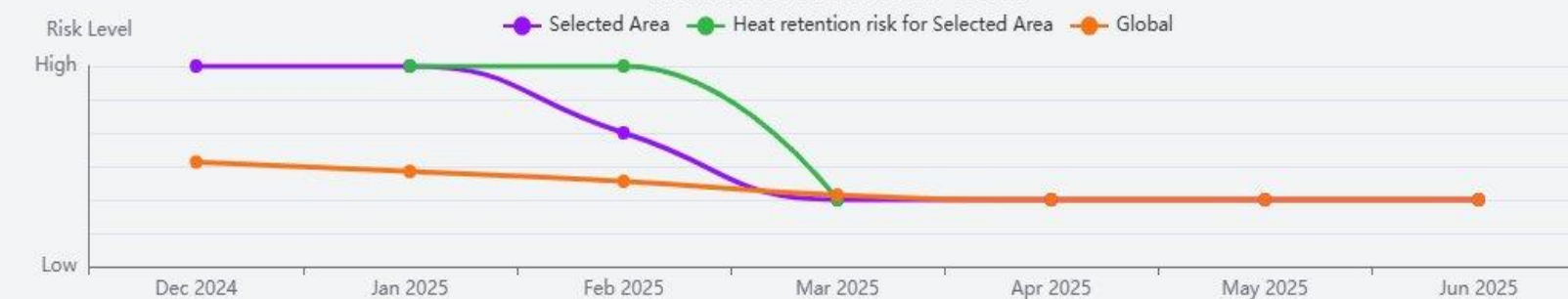
▸ Heat risk

- ⚠ Selected month above average
- ⚠ Selected zone above average
- ✓ Area of low heat retention

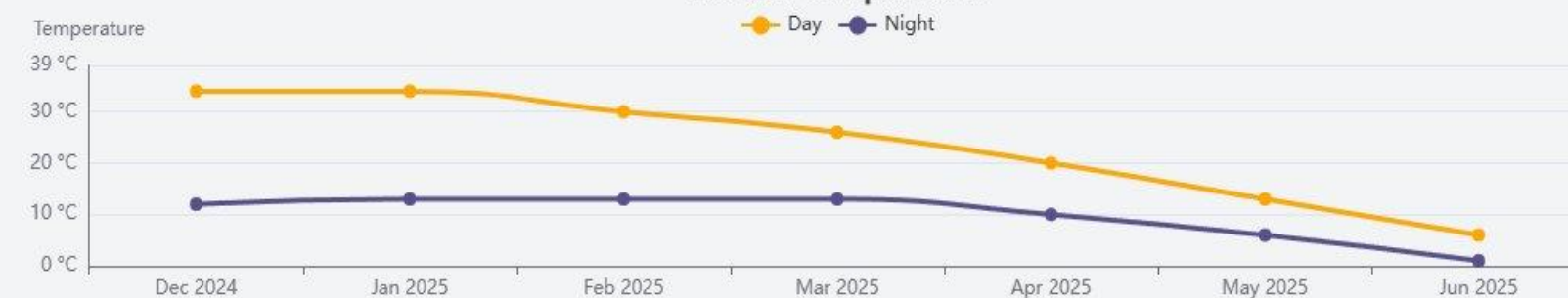
Heat Risk Classes



Heat Risk Trend Over Time



Surface Temperature



▸ Flood risk

No Data

No Data

No Data

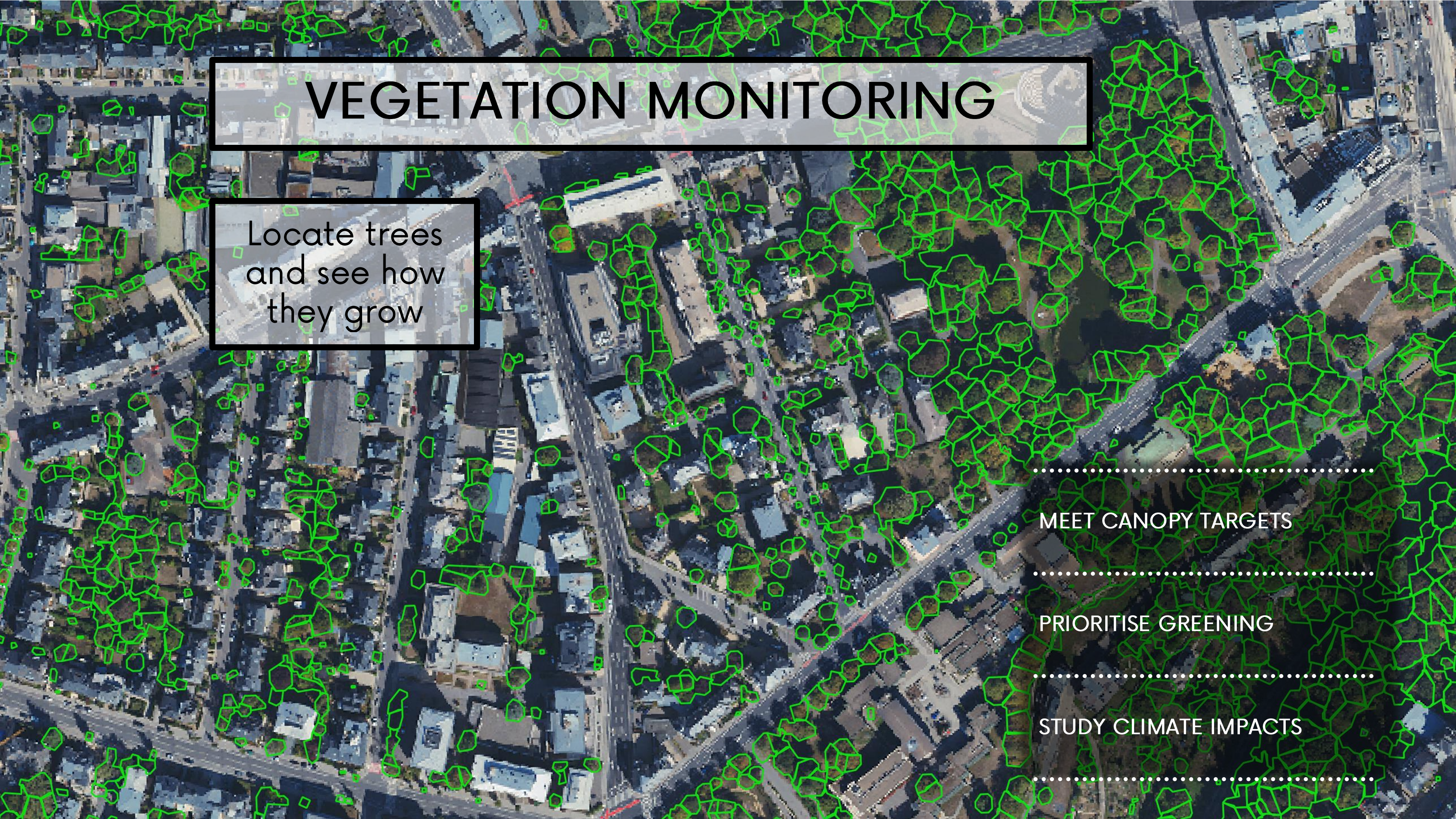
▸ Fire risk

High risk

High risk

High risk

- ⚠ Selected month above average



VEGETATION MONITORING

Locate trees
and see how
they grow

MEET CANOPY TARGETS

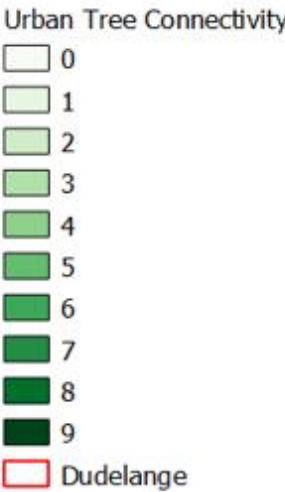
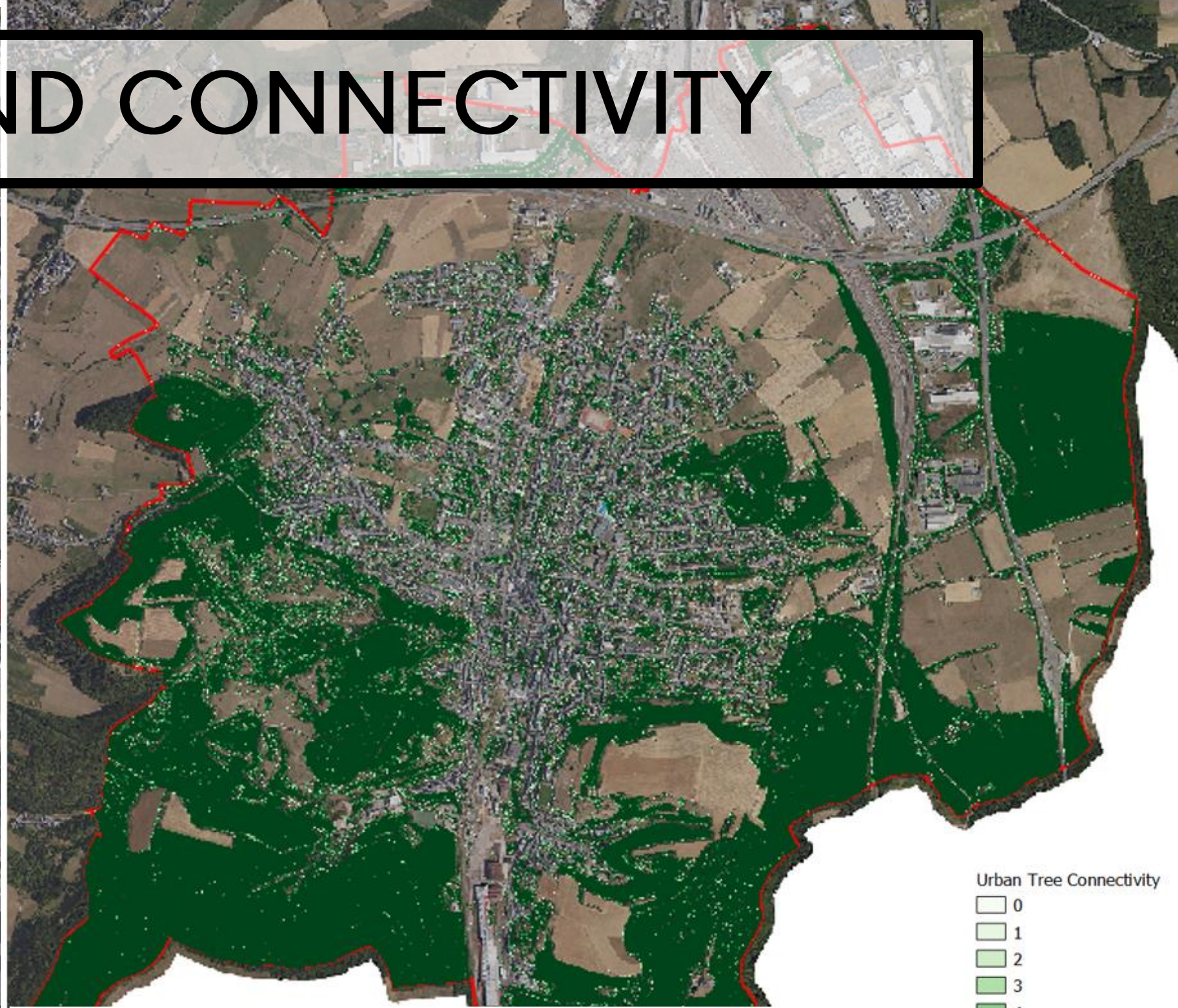
PRIORITISE GREENING

STUDY CLIMATE IMPACTS

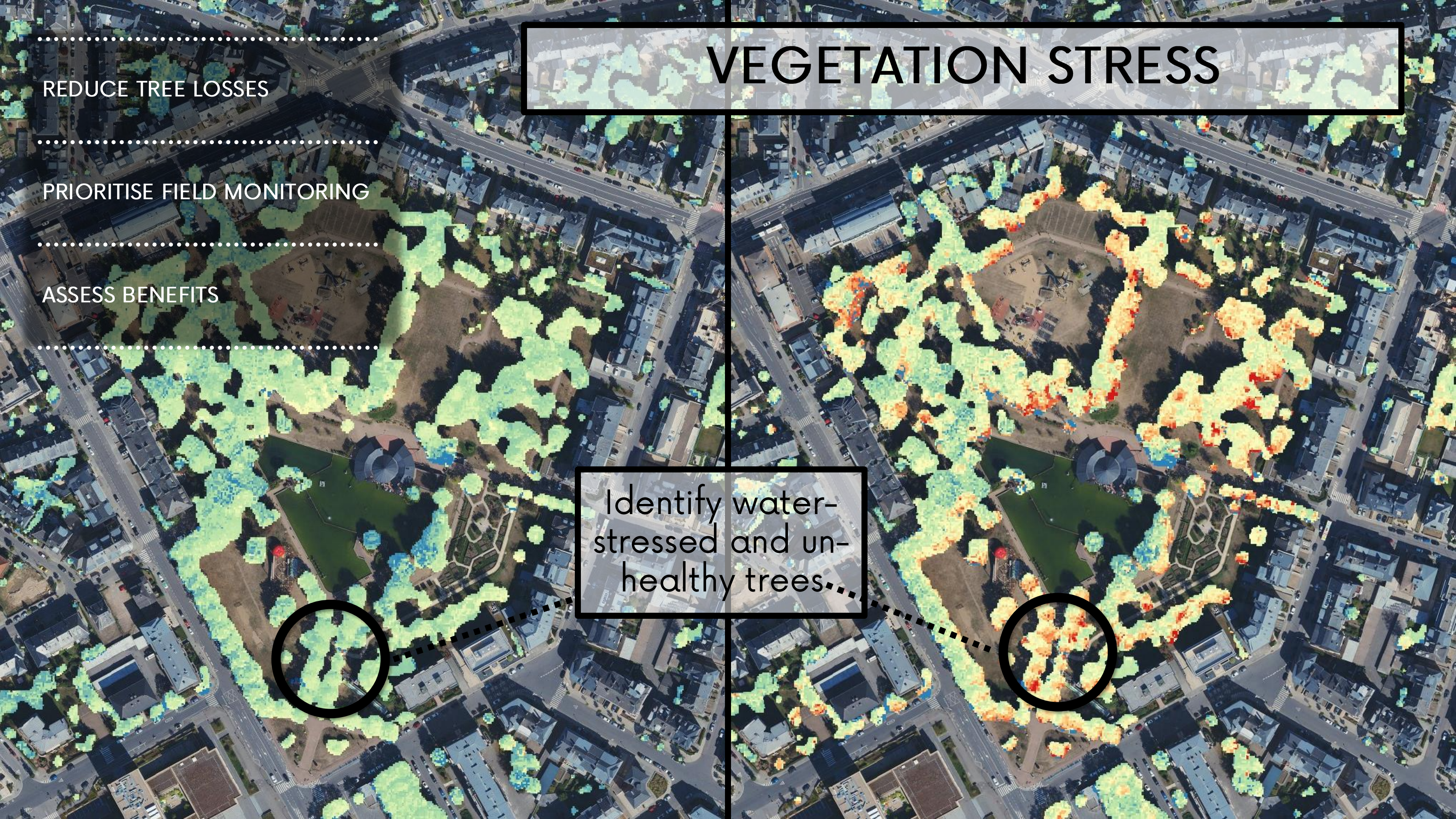
VEGETATION HEALTH AND CONNECTIVITY



Tree health: Using NDVI and Chlorophyll content



Indicator	Permeable surfaces (soil, grass, shrubs, trees)	Urban green (grass, shrubs, trees)	Urban trees
Degree of coherence (C) [%]	15.0	5.0	1.9
Landscape division (D) [%]	85.0	95.0	98.1
Effective mesh size (m) [km2]	3.2	1.1	0.4
Cross boundary connection (CBC) [km2]	3.2	1.1	0.4



VEGETATION STRESS

REDUCE TREE LOSSES

PRIORITISE FIELD MONITORING

ASSESS BENEFITS

Identify water-stressed and unhealthy trees



Growth
Tracking

Assess Risk to
Railway per
Tree

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OPTIMISE PRUNING

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REDUCE RISK

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URBAN HEAT

Land Surface
Temperature at
10m Resolution

Identify at-risk
neighborhoods
during heatwaves

ALERTS FOR HIGH-RISK AREAS

IDENTIFY PROPERTY RISK

UNDERSTAND GREEN SOLUTION NEEDS

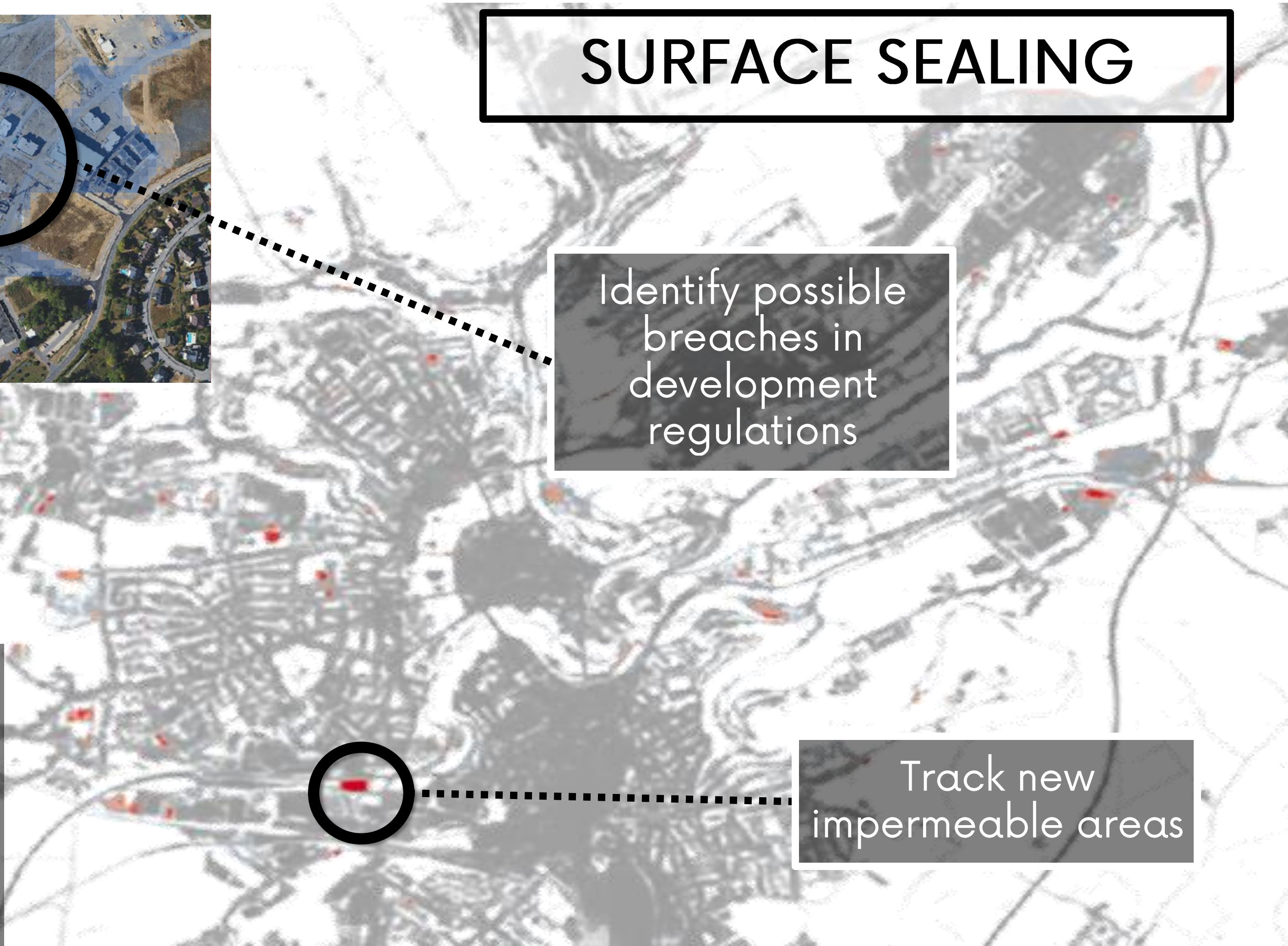
SURFACE SEALING

Identify possible
breaches in
development
regulations

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ENFORCE DEVELOPMENT
REGULATIONS
.....

UNDERSTAND FLOOD RISK
.....

Track new
impermeable areas



WILDFIRE RISK

Identify
proximity/structure
and flammability of
vegetation

Identify assets at
high risk

ALERTS FOR HIGH-RISK AREAS

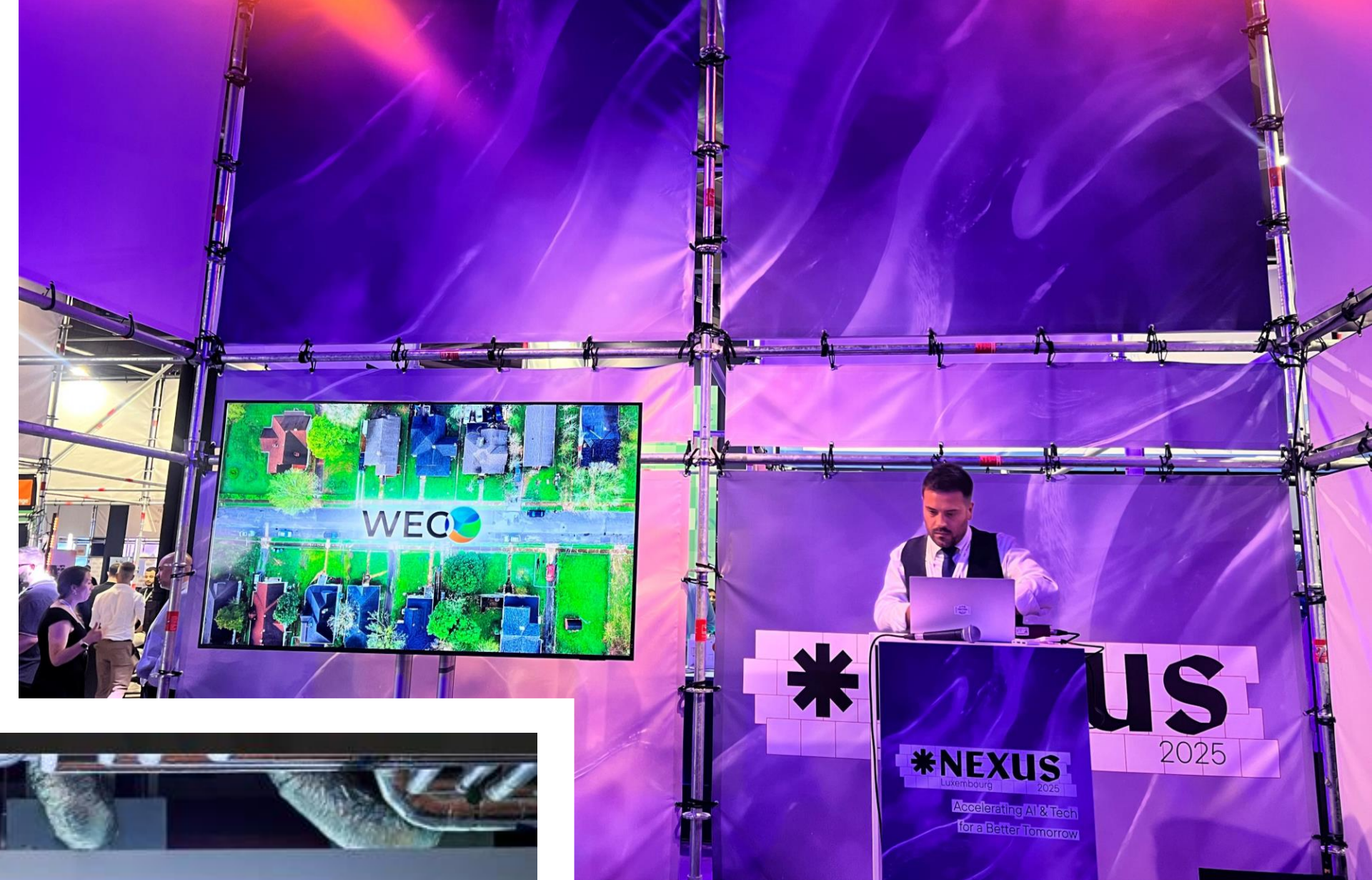
IDENTIFY PROPERTY RISK

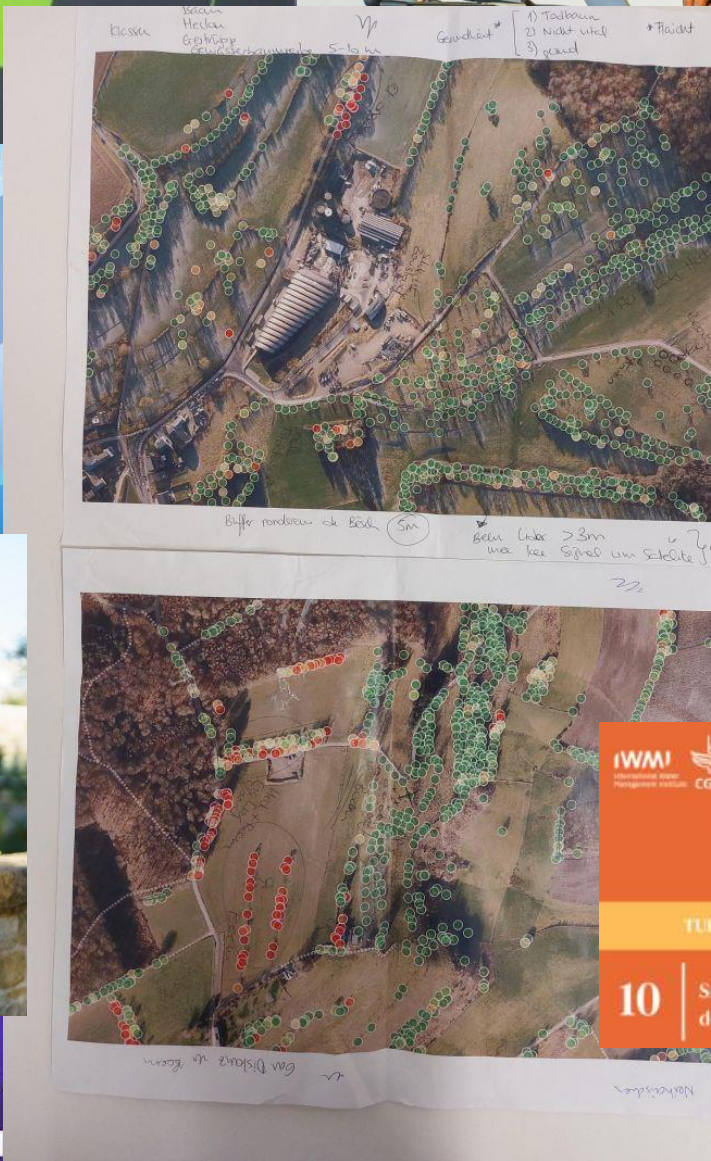
RISK MITIGATION STRATEGIES





Impact





1st UN Civerse Challenge

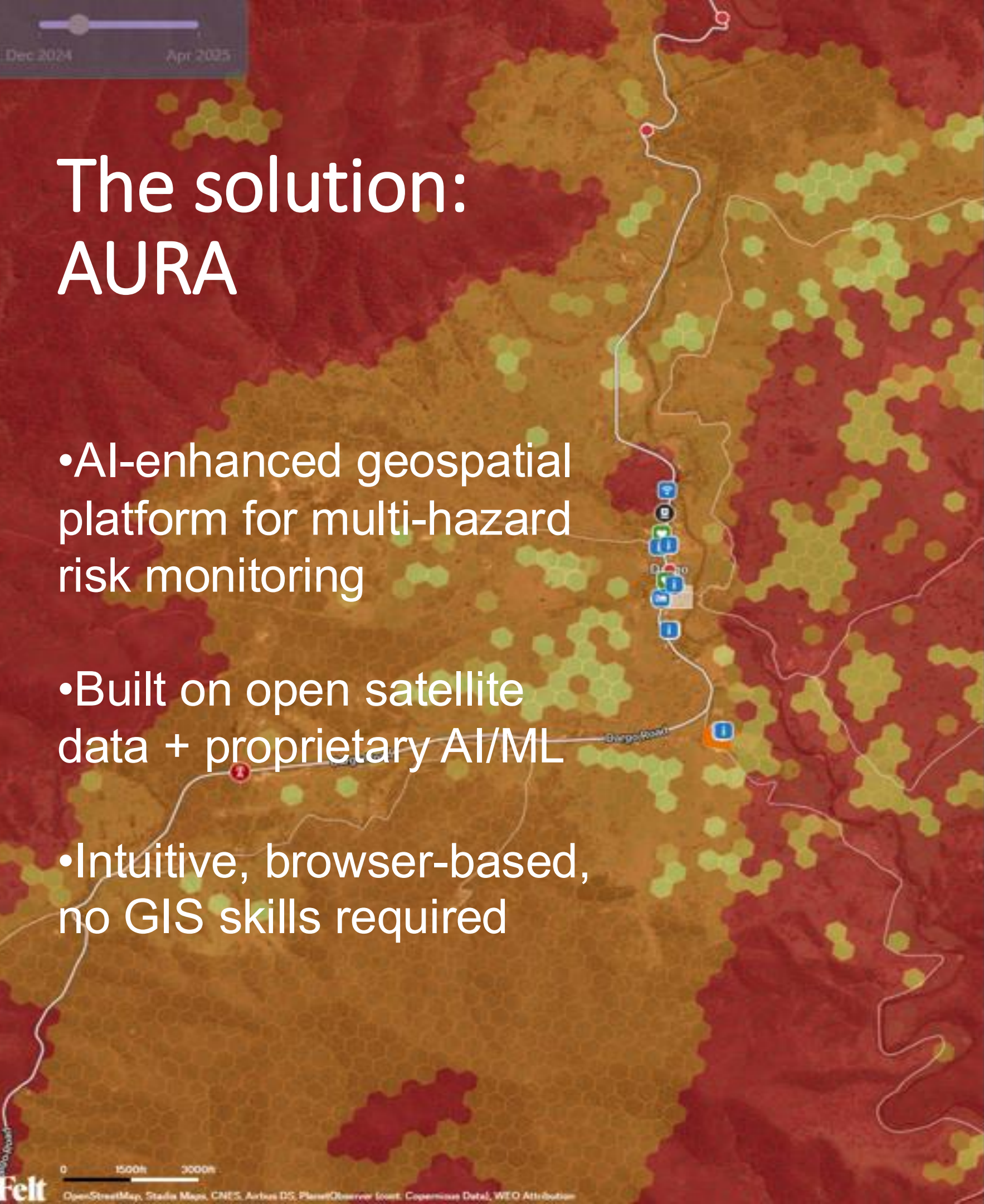
Civerse: Designing digital public infrastructure of future cities

AURA Integration with CitiVerse

- Aligned with CitiVerse principles: open, accessible, interoperable, inclusive
- REST APIs feed directly into CitiVerse dashboards/simulations
- Adds resilience intelligence layer to virtual cities
- Use cases: planning, education, participatory budgeting, early warning

Co-organized by:





The solution: AURA

- AI-enhanced geospatial platform for multi-hazard risk monitoring
- Built on open satellite data + proprietary AI/ML
- Intuitive, browser-based, no GIS skills required

Details

Solutions Risk & Data

Fire

- Community members should regularly clear vegetation and maintain a defensible space around their homes, especially given the high percentage of separate houses in the area and Dargo and its proximity to Alpine National Park.
- Local authorities should conduct community workshops on creating personalized bushfire survival plans, emphasizing early evacuation given the single road (Omeo Road Bridge) and the older median age.
- Establish a local fire watch program, utilizing community volunteers to monitor high-risk areas during peak fire season, and ensure clear communication channels (e.g., UHF Channel 40).

Flood

- Community members should develop and practice household evacuation plans, specifically identifying alternative routes if Omeo Road Bridge becomes impassable due to flooding.
- Local authorities should install clear flood markers at Omeo Road Bridge and other low-lying road sections, alongside real-time road condition updates via local communication channels (e.g., ABC Radio, VicEmergency App).
- Local authorities should conduct regular assessments and maintenance of local drainage systems and natural waterways to improve water flow and reduce local flooding impacts in residential areas.

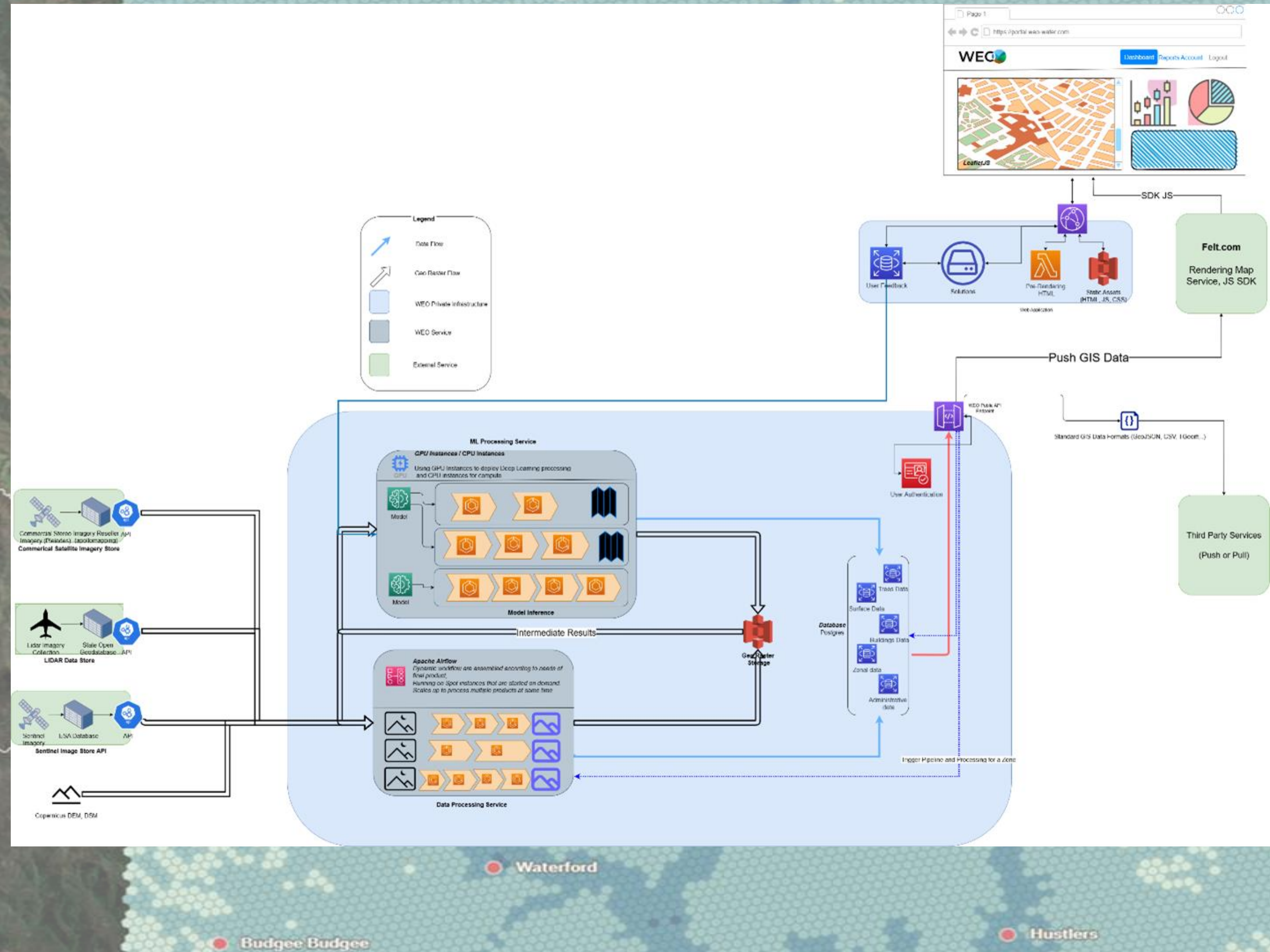
Heat

- Community members should identify and prepare a designated cool space within their homes or know the location of the Dargo Hotel as a potential community center during extreme heat events.
- Local authorities should implement a "buddy system" or community check-in program, focusing on community members at-risk, especially during prolonged heatwaves, leveraging local networks.
- Promote and subsidize the installation of passive cooling measures (e.g., reflective coatings, improved insulation, external shading) for private dwellings, given the high percentage of separate houses owned outright.

AURA

Technical architecture

- Cloud-native, modular, scalable
- Ingestion: open EO data (ESA/NASA) + ground datasets
- AI/ML pipeline → risk maps & analytics
- Geospatial DB with H3 indexing
- Browser-based frontend (SvelteKit + Felt.com for rendering)
- Interoperable outputs: GeoJSON, GeoTIFF, CSV, APIs



AURA is innovation and AI value

- Up to **70% cheaper** than the market average
- **High-resolution**, actionable insights from open EO data powered by AI
- **Multi-hazard** mapping: fire, flood, heat
- **Vegetation and surface** analysis: tree health, impermeability
- **Urban heat island and land surface temperature** (LST) analysis, day/night, with historical data (10+ years)
- **Generative AI** suggesting tailored interventions
- **Human-in-the-loop**: continuous model improvement via user and community feedback

Details

Solutions

Data

Area risk analysis

Heat risk

Reduced risk

Flood risk

Reduced risk

Fire risk

High risk

Area data

Tree count

766 trees

Tree connectivity

Trees are connected

Fire History

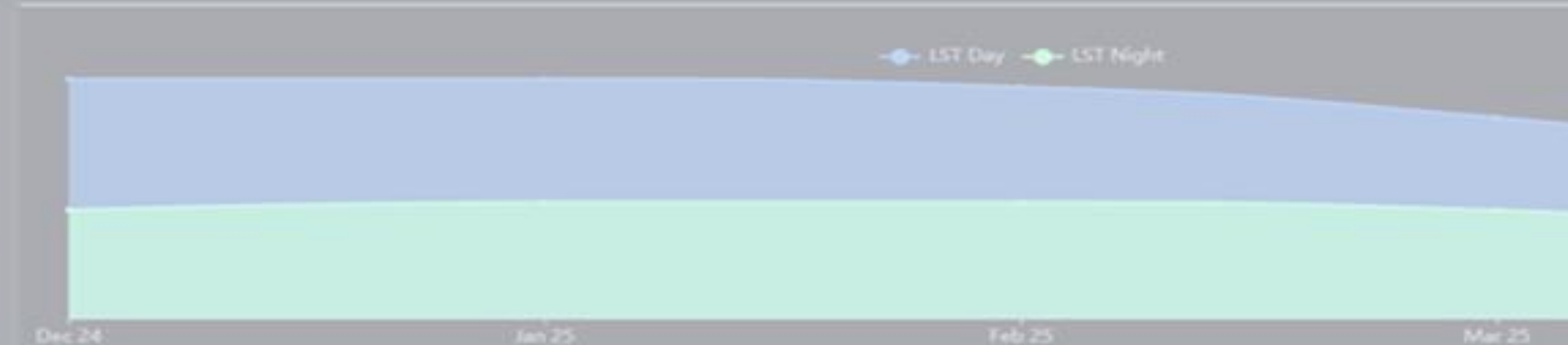
Fire has been recorded

Tree height

Mostly medium trees

Water stress

High stress



Thank you for
your attention!

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