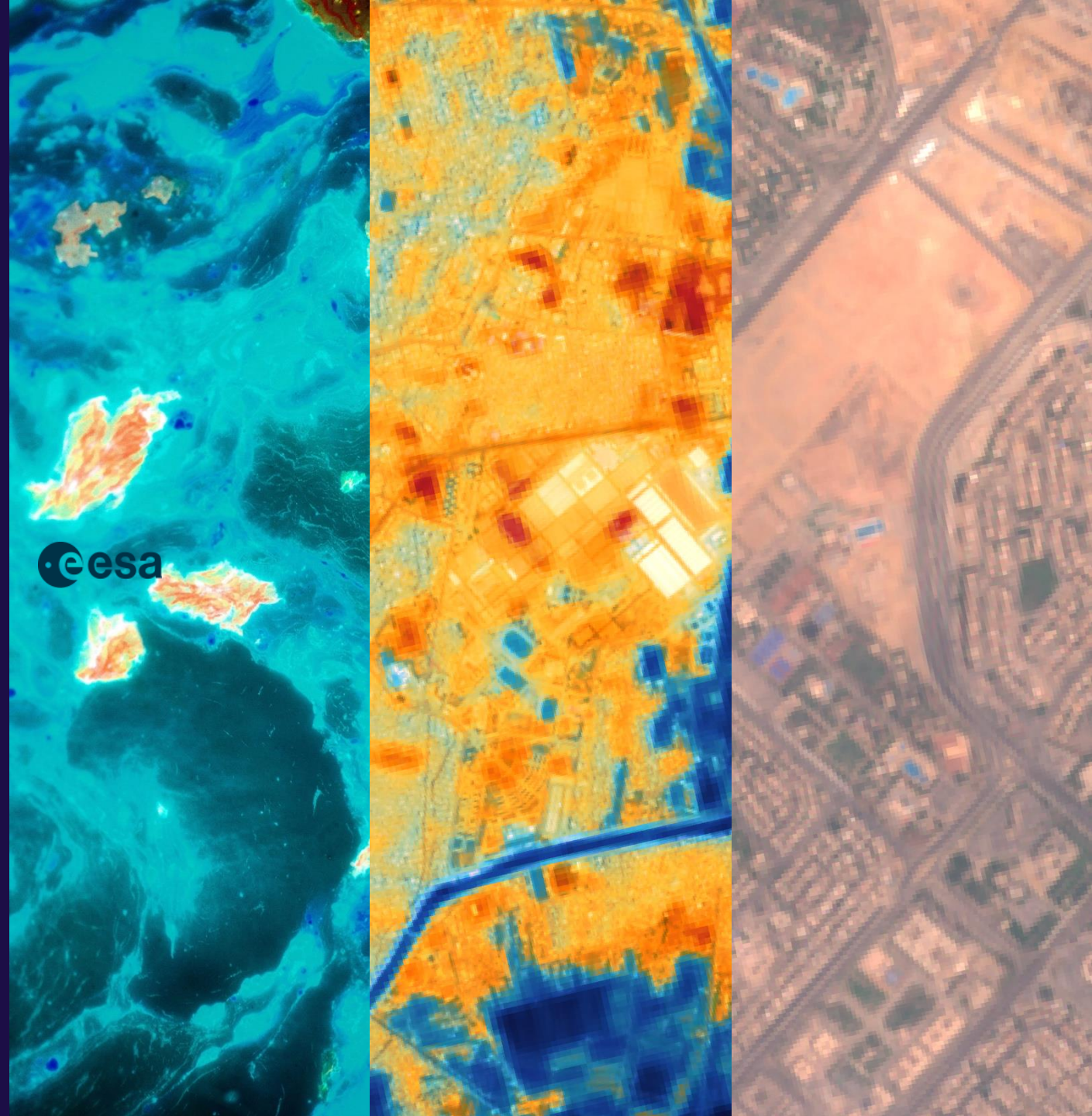




SEE THE UNSEEN: World-leading Accuracy In Thermal Intelligence

→ Mohammad IRANMANESH,
mohammad.iranmanesh@constellr.com



constellr: Europe's leader in high-resolution thermal Earth Observation

2 operational satellites today

>30

GROWING CONSTELLATION
satellites by 2030



- Munich, Berlin, Brussels, Toulouse.
- - 1st launch (1st gen) in 2022
 - today 2 sats (2nd gen) operational
several in production;
 - 3rd gen from 2028
- Delivering thermal intelligence to
enable societal resilience and
sovereignty

We operate a satellite constellation for continuous, global monitoring of Land Surface Temperature (LST)

Skybee-1 and Skybee-2!

High accuracy

- Unique cryocooled thermal sensor: ± 2.0 °C accuracy, ± 0.1 °C precision

High spatial resolution

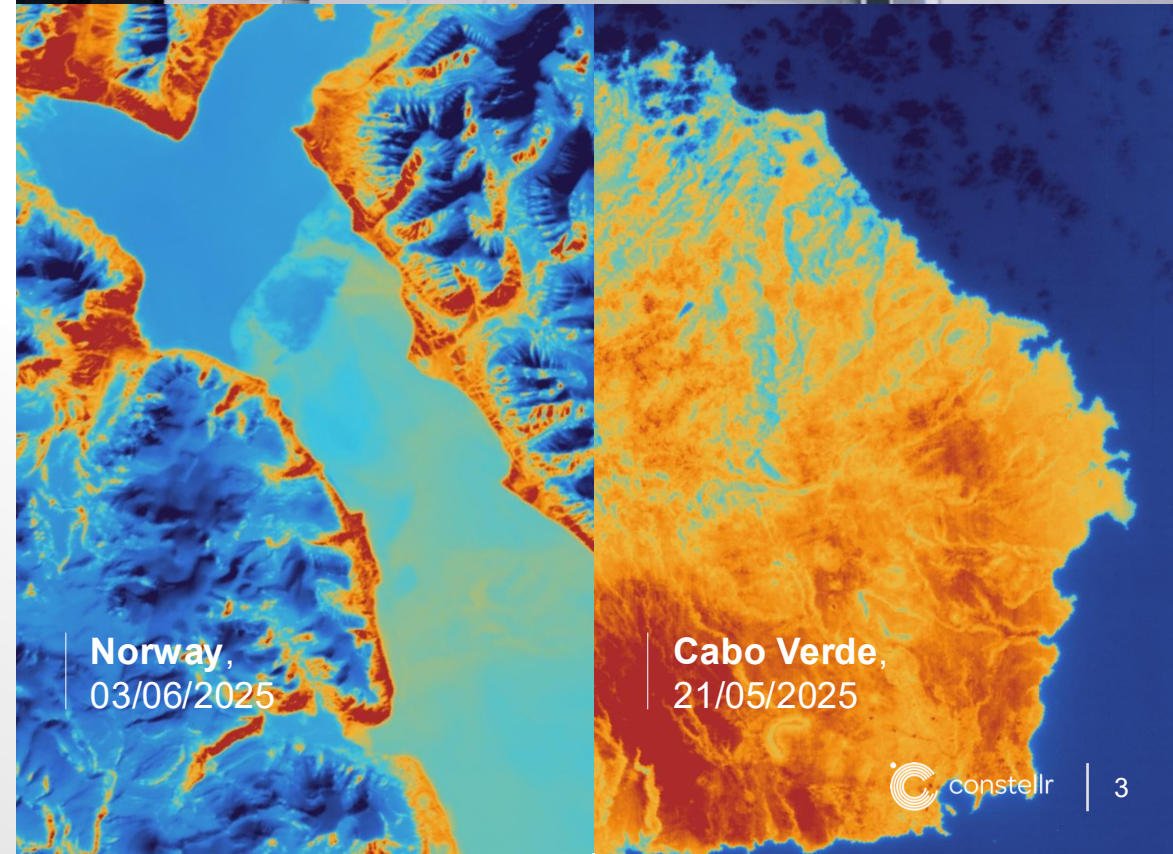
- GSD: 30 m thermal, 10m visible & near-infrared

Imaging capacity

- Of up to 1,000,000 km² per satellite per day

High temporal resolution

- Global coverage and daily revisit time



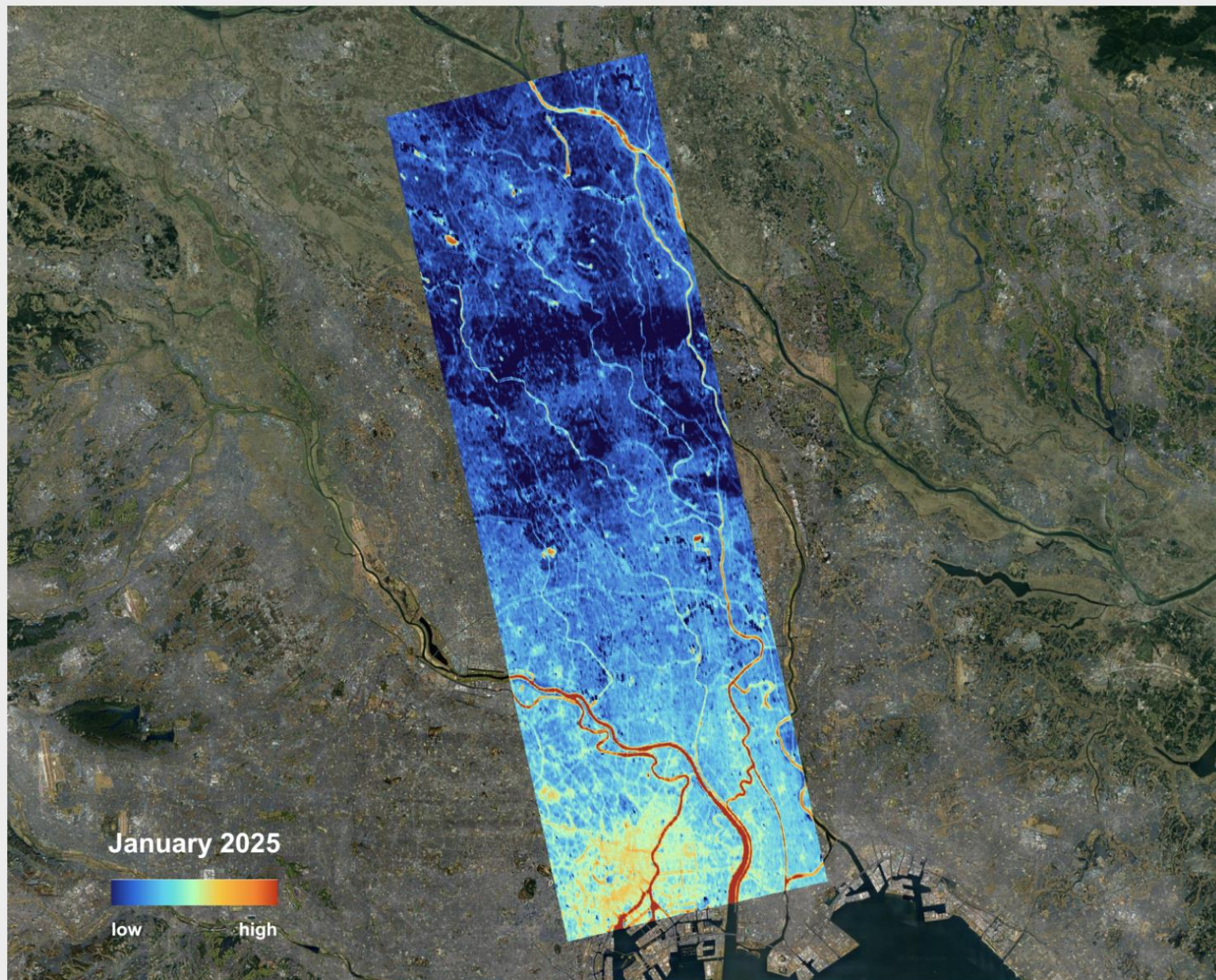
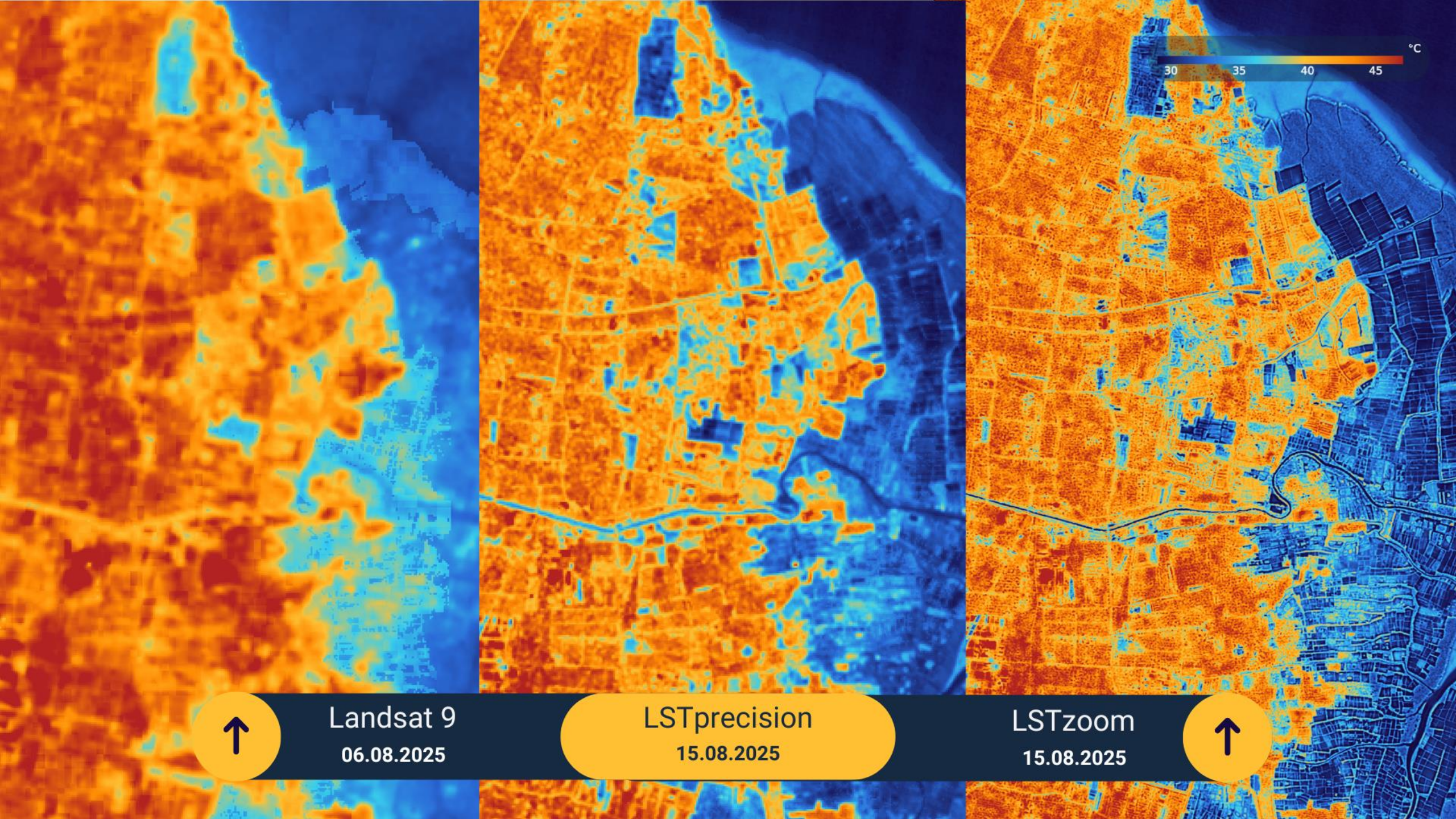


Figure 1: First light imagery over Tokyo at night from SkyBee-1, copyright: constellr



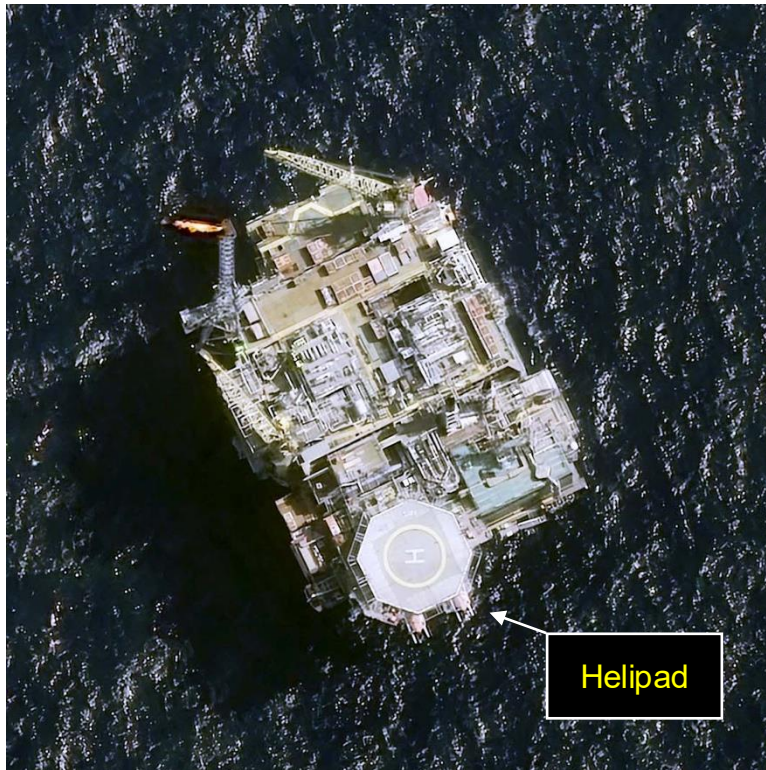
Thermal completes the picture: beyond optical/SAR

Existing Today



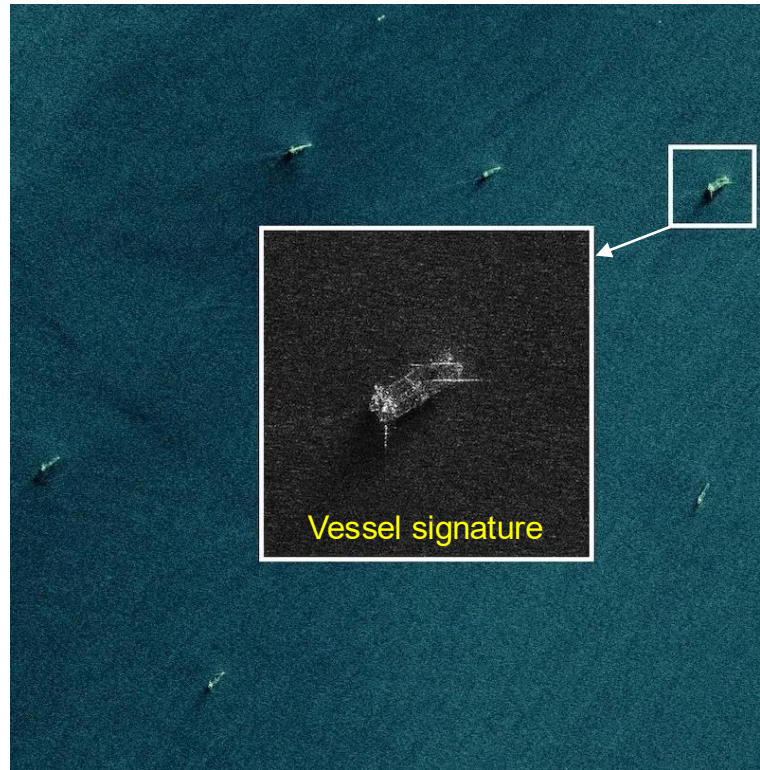
Optical

Feature Detection



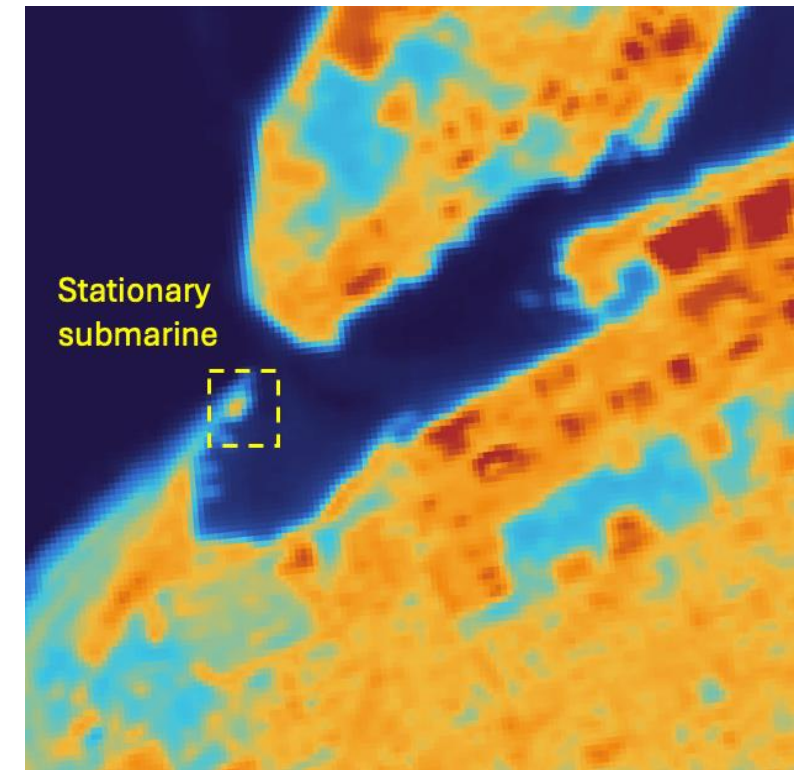
SAR

Geometric Information



Thermal

Activity Levels



Thermal imagery shows patterns of activity — day or night, through camouflage, cloud, or terrain. It answers questions other sensors can't

Industrial Awareness:

Seeing activity beyond line of sight

THE SITUATION:

A refinery's processing units, furnaces, and flaring areas are visually indistinguishable, making activity levels impossible to assess from optical imagery alone

WHAT THERMAL REVEALS:

Distinct temperature signatures expose which units are active, idle, or overheating - even when line-of-sight is obstructed

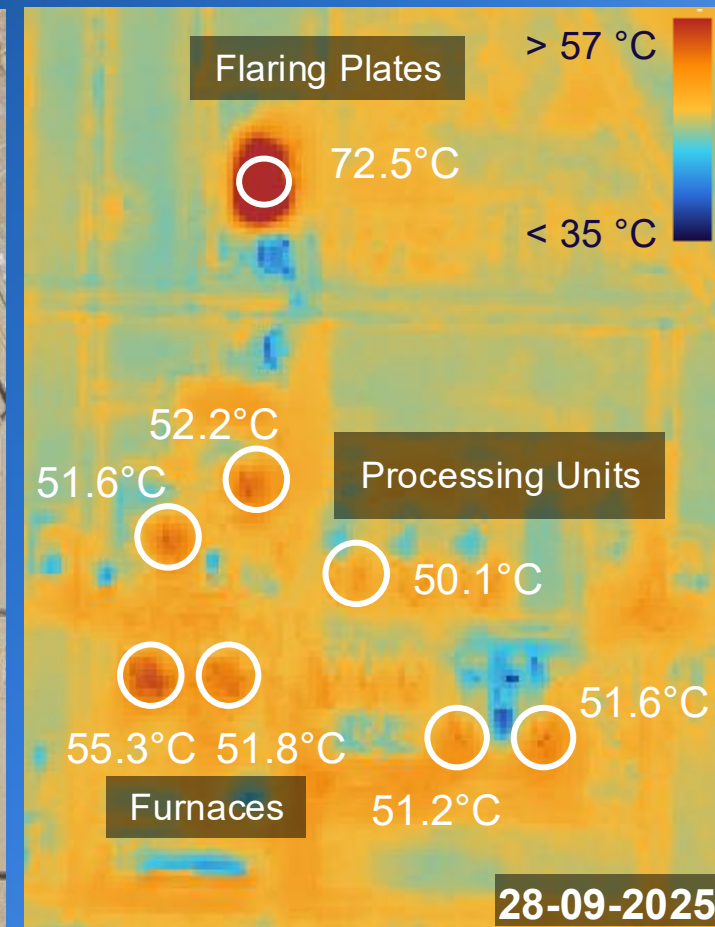
THE ENABLED INSIGHT:

Analysts can verify operational status, detect abnormal heat patterns in high-risk zones, and track changes over time without on-site access

VISUAL



THERMAL



Snapshot of Al Zour Refinery, Kuwait reveals differences between flaring plates, furnaces & processing units

Urban Dynamics:

Intelligence beyond what the eyes can see

■ THE SITUATION:

Daytime optical imagery shows little - Dotonbori looks structurally quiet, with no hint of its true activity

■ WHAT THERMAL REVEALS:

Thermal contrast shows the district cool by day and intensely active at night, exposing patterns optical sensors completely miss

■ THE ENABLED INSIGHT:

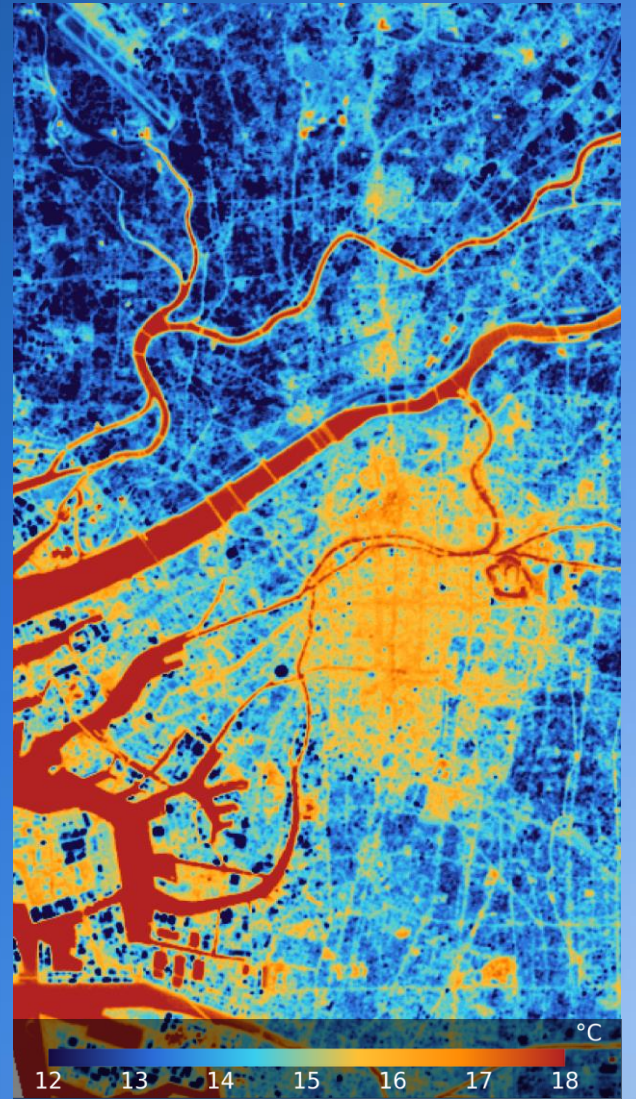
Analysts can see real behavioural hotspots and detect shifts in urban rhythms that conventional imagery cannot reveal

Osaka, Japan, Dotonburi district

DAY



NIGHT



Infrastructure Monitoring Under Extreme Heat Stress

Dubai International Airport, Dubai, UAE

Dubai Airport isn't just the world's busiest airport; it's also a giant thermal system. Analyzing its heat patterns can help improve safety, cut costs, and reduce environmental impacts.

1

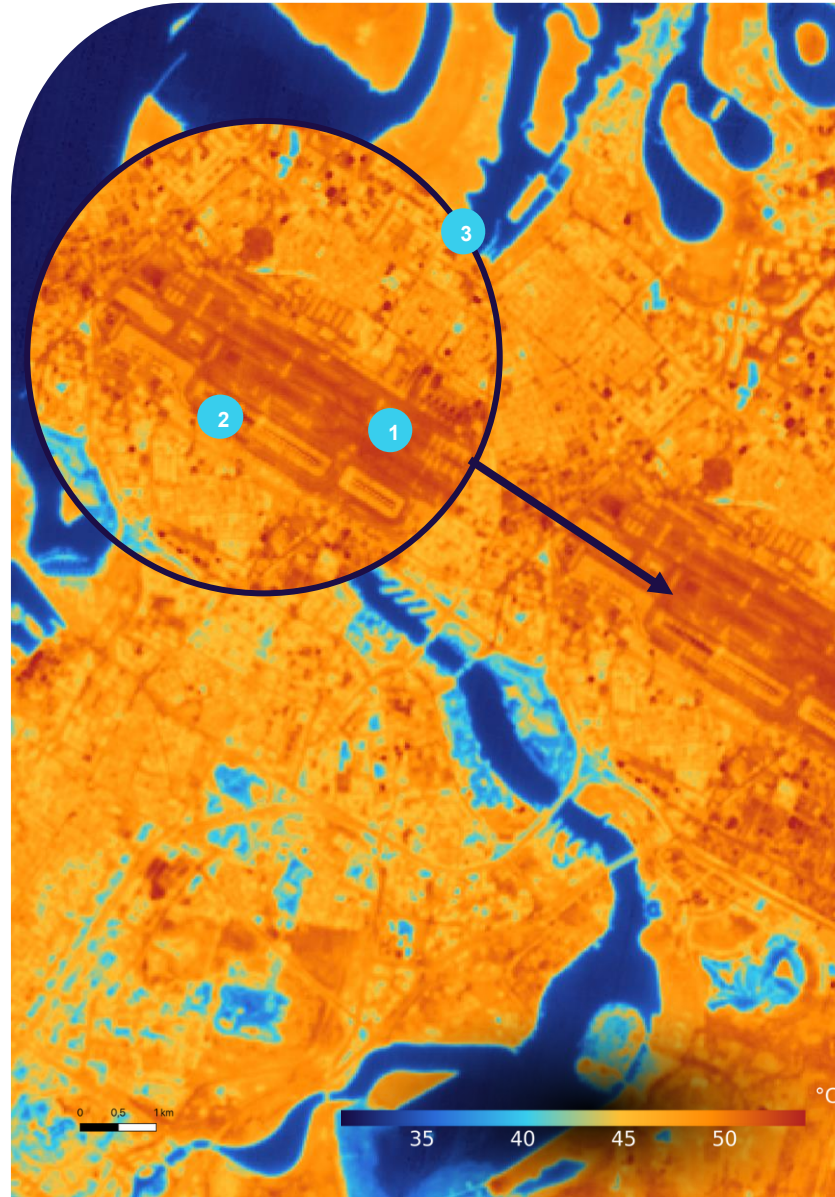
Absolute temperature mapping reveals early signs of runway and taxiway heat stress.

2

Pinpoint hotspots on roofs, facades, and terminals to guide cooling and retrofitting.

3

Track long-term heat patterns for climate resilience and sustainability reporting.

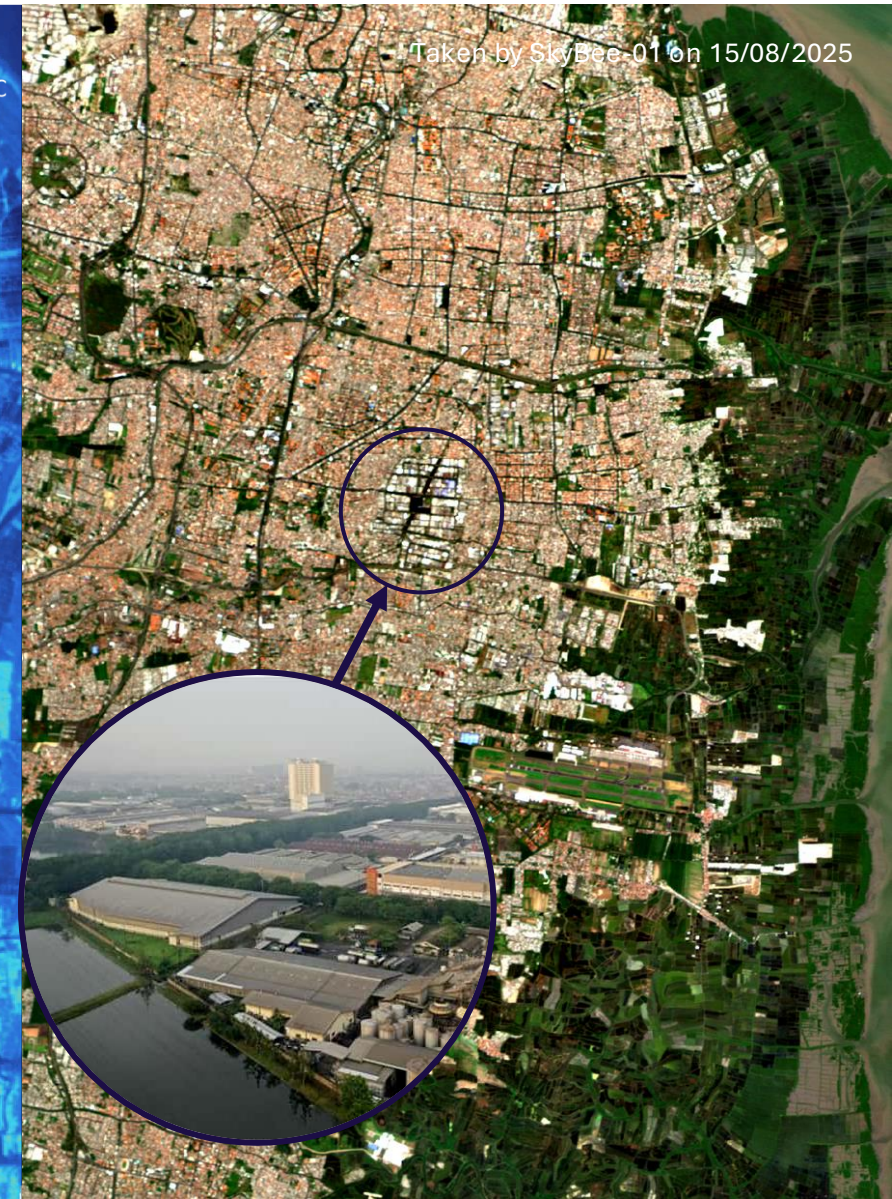
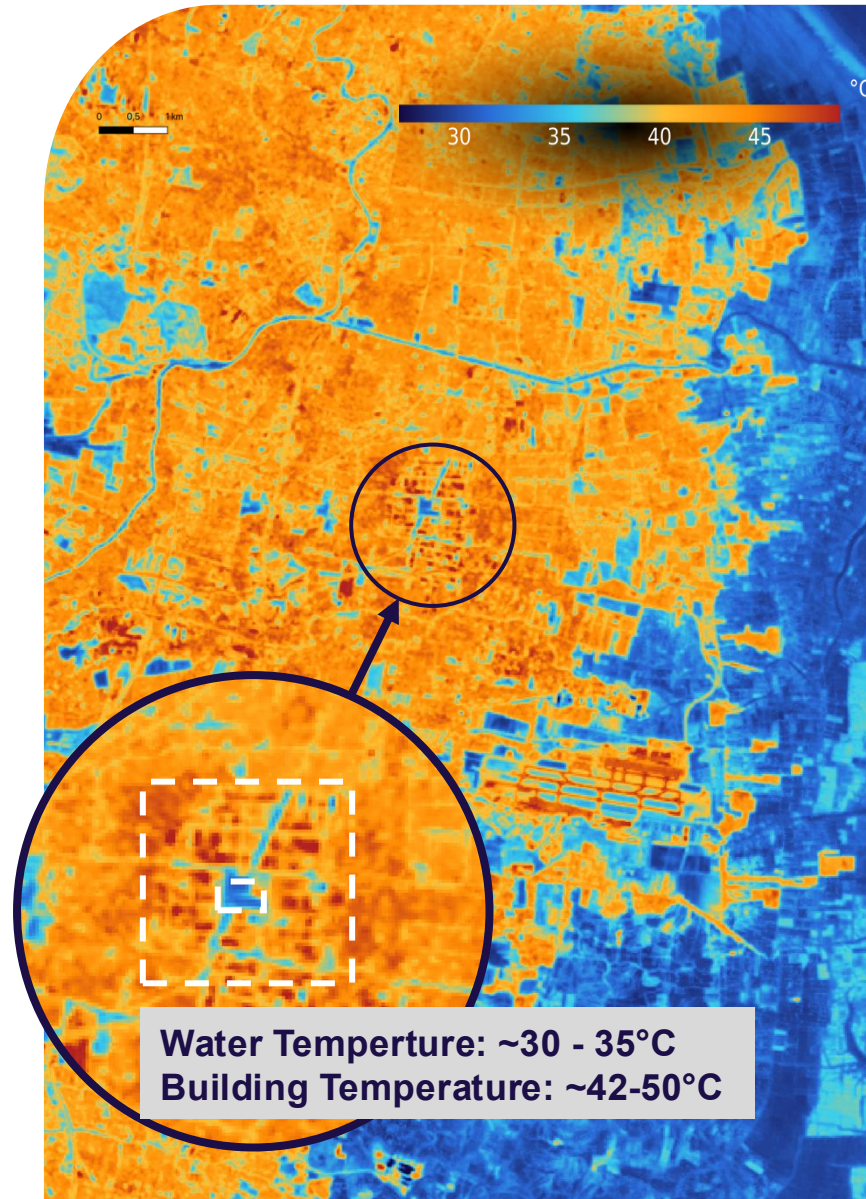


Urban hot and cold spot analysis

Surabaya Industrial Estate Rungkut (SIER), Surabaya, Indonesia

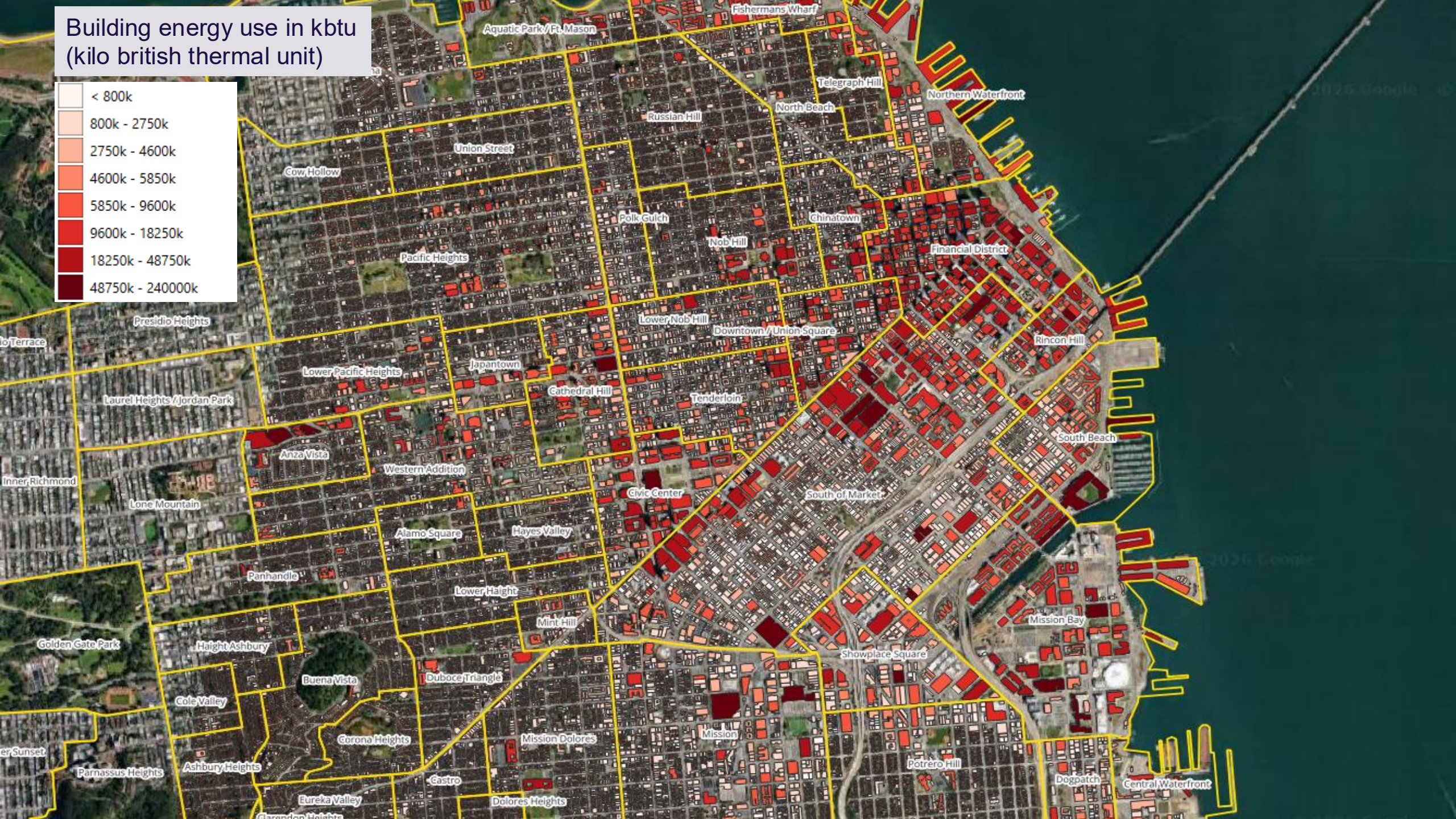
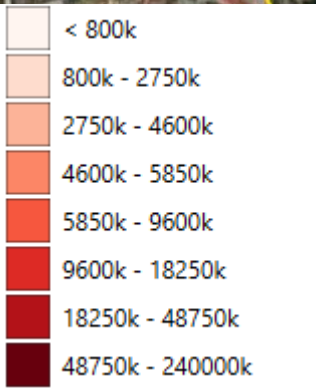
In Surabaya's Industrial Estate Rungkut (SIER), warehouses and factories run hot - making it a key site for thermal monitoring of energy use, manufacturing, and logistics.

- **Industrial Heat Mapping:**
Detect hotspots across factories and warehouses to monitor energy use, equipment efficiency, and potential overheating risks.
- **Environmental Oversight:**
Track thermal emissions and monitor the wastewater treatment plant's performance for better environmental management.
- **Operational Tracking:**
Analyze heating patterns and trends to derive productivity indicators.

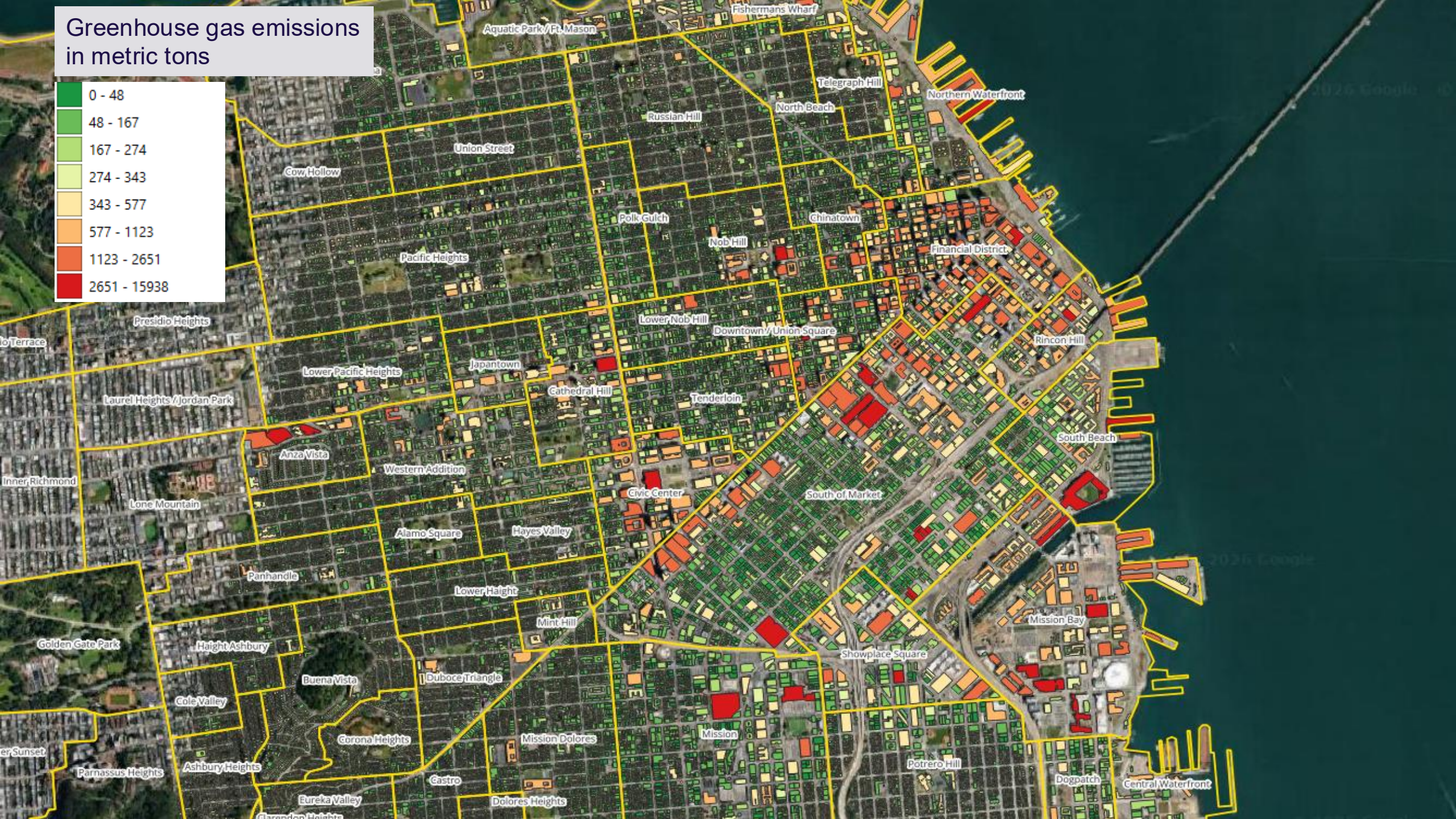
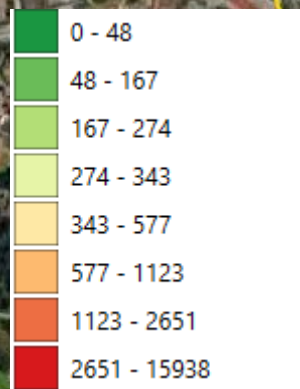


BUILDING ENERGY EFFICIENCY

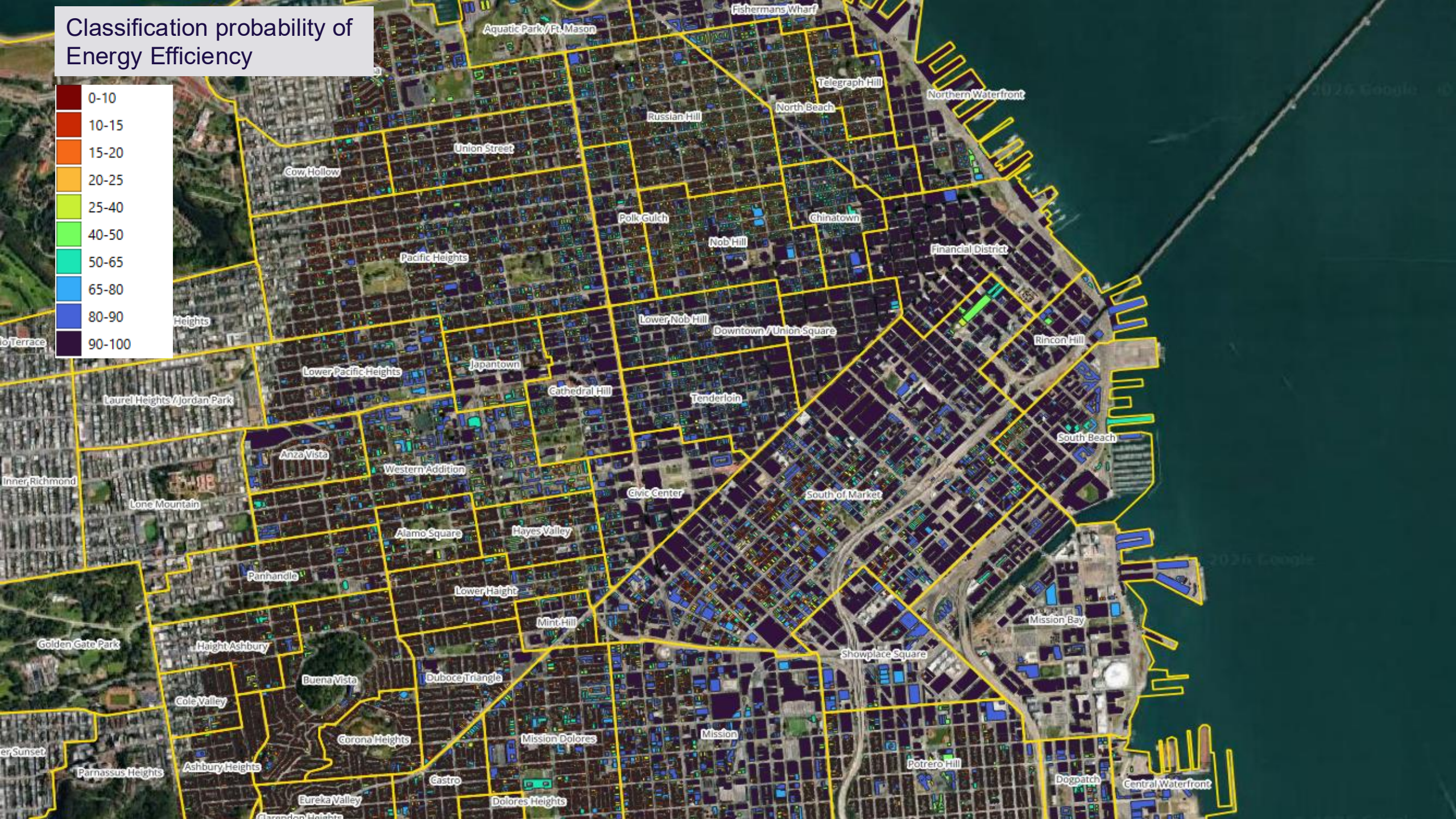
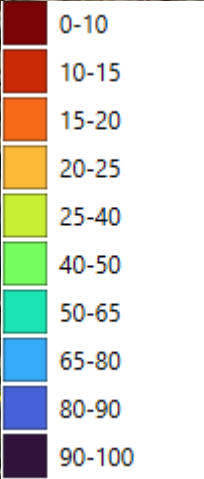
Building energy use in kbtu
(kilo british thermal unit)



Greenhouse gas emissions in metric tons



Classification probability of Energy Efficiency

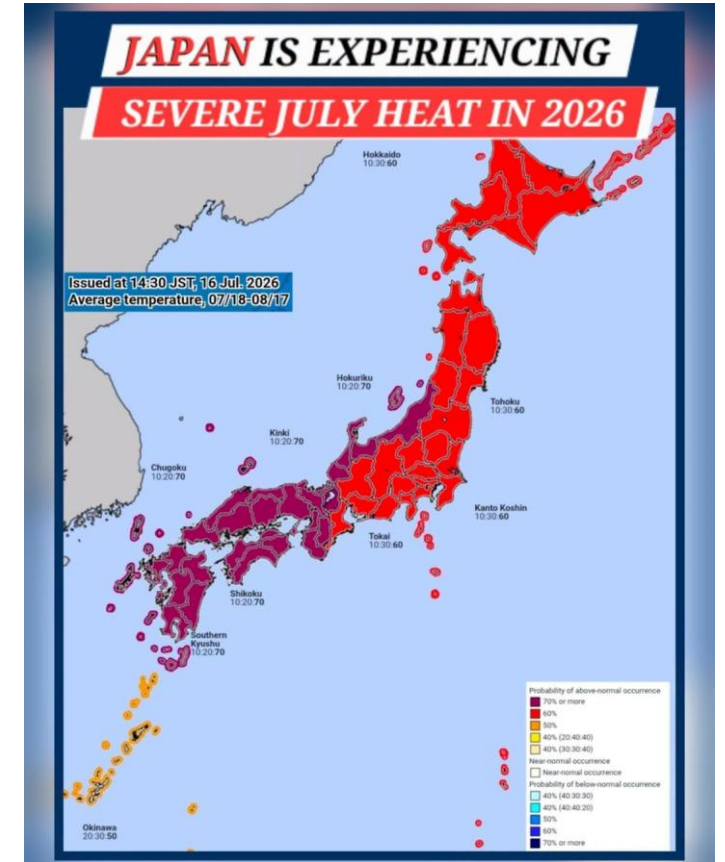
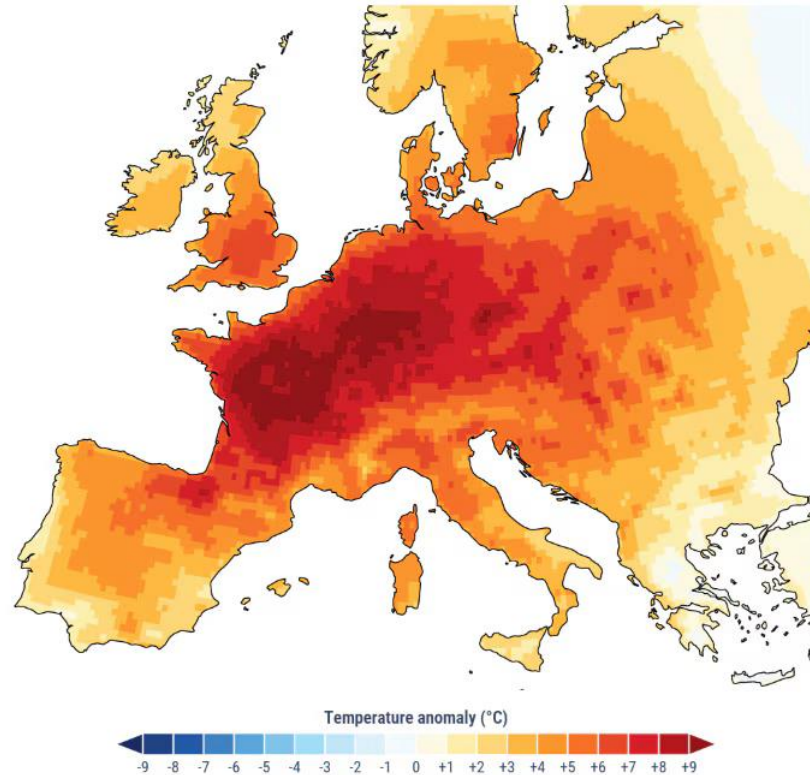


HEATWAVES & POPULATION EXPOSURE

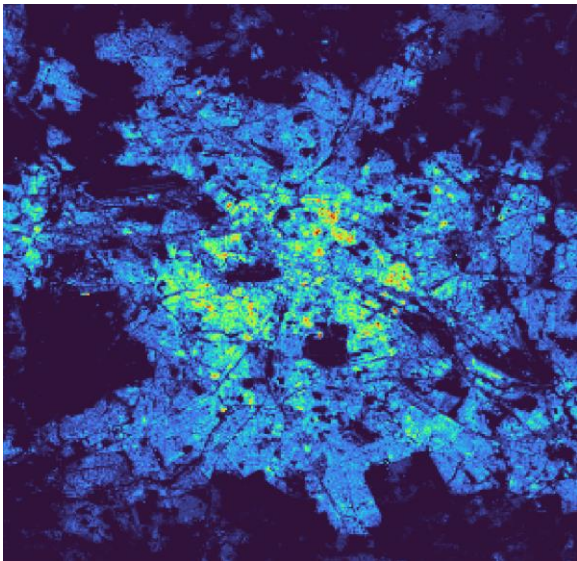
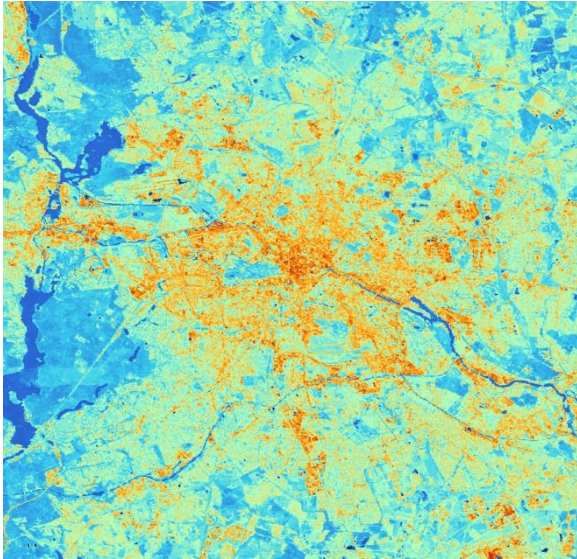


Average surface air temperature anomaly for 18–30 June 2026

Data: ERA5 • Reference period: 1991–2020 • Credit: C3S/ECMWF



LST & Population data

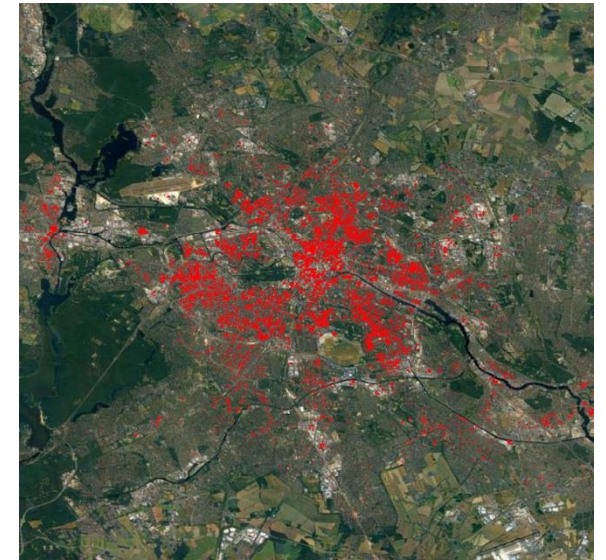


LST

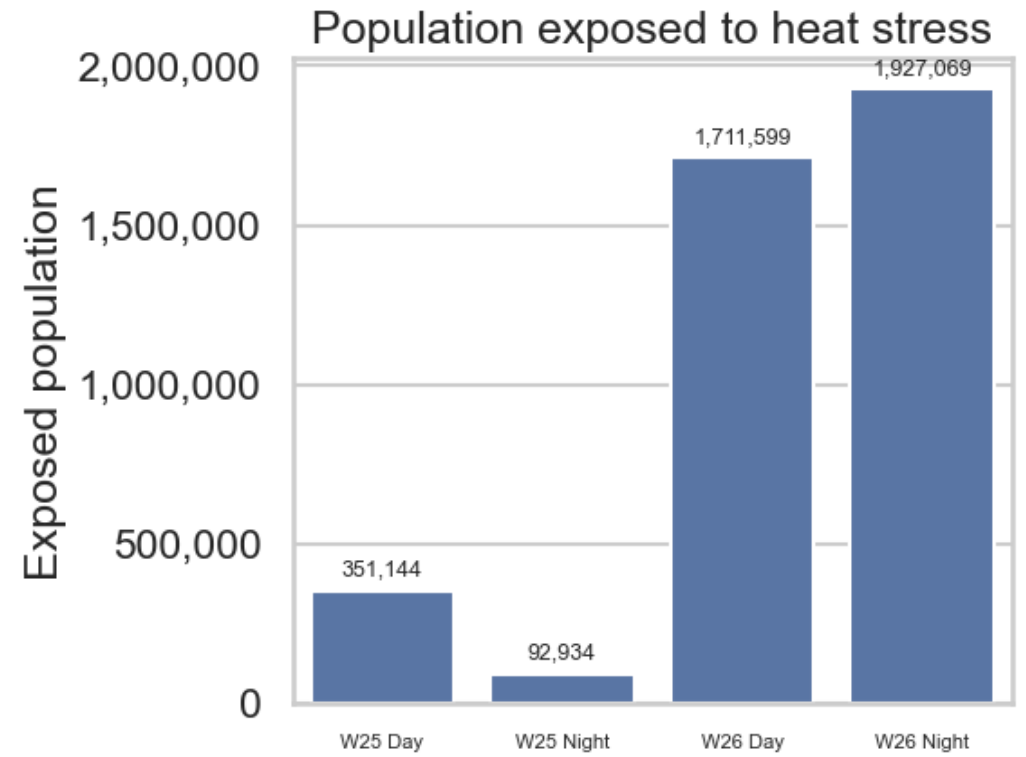
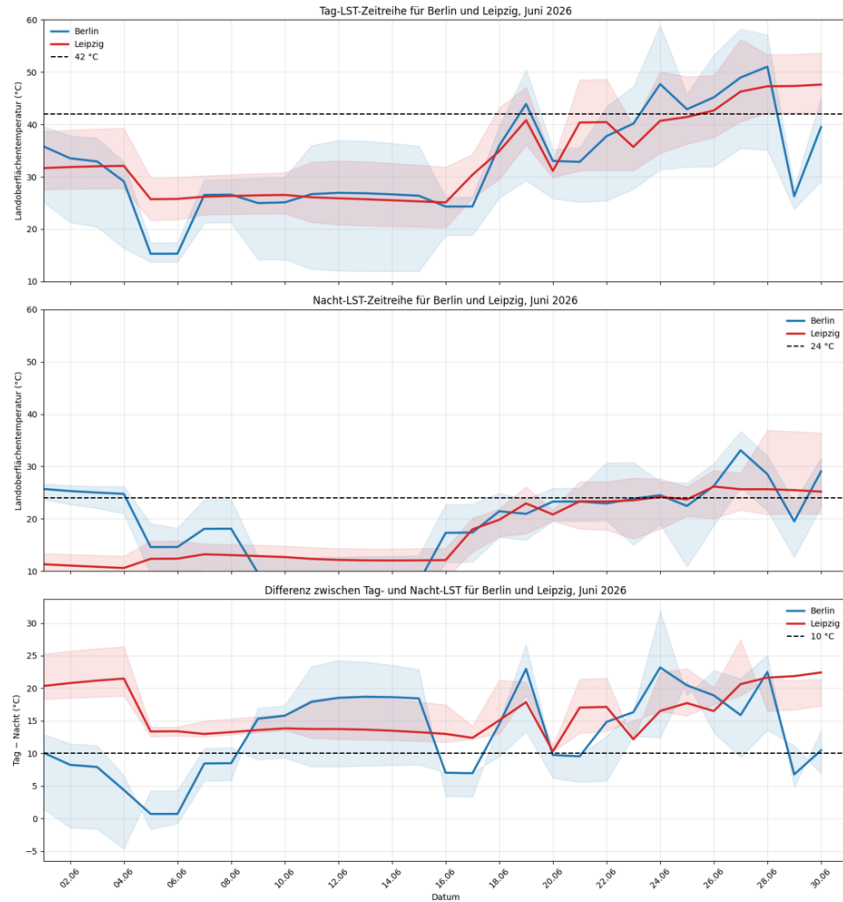


GHSL

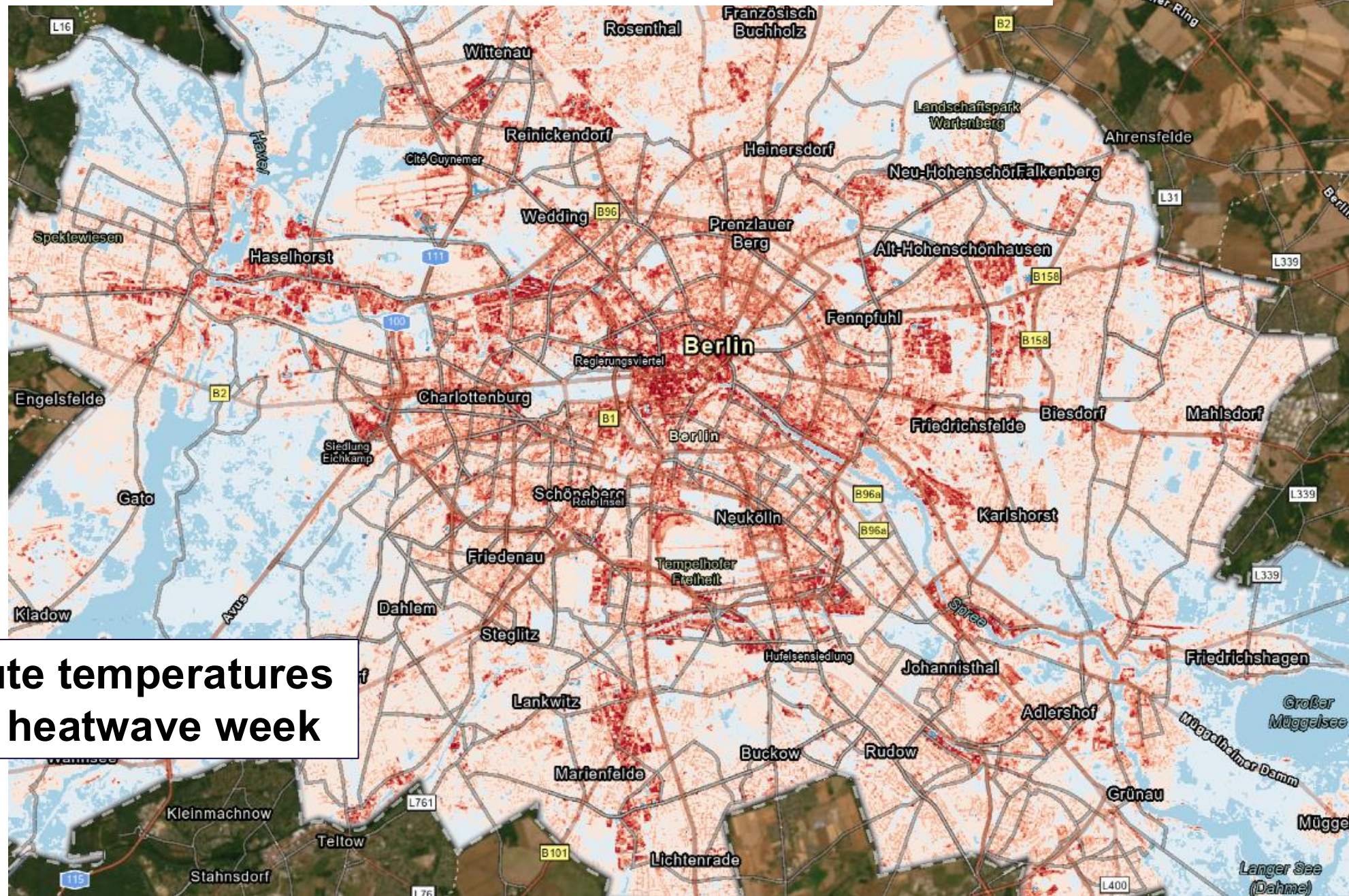
Population Exposure



LST Time Series



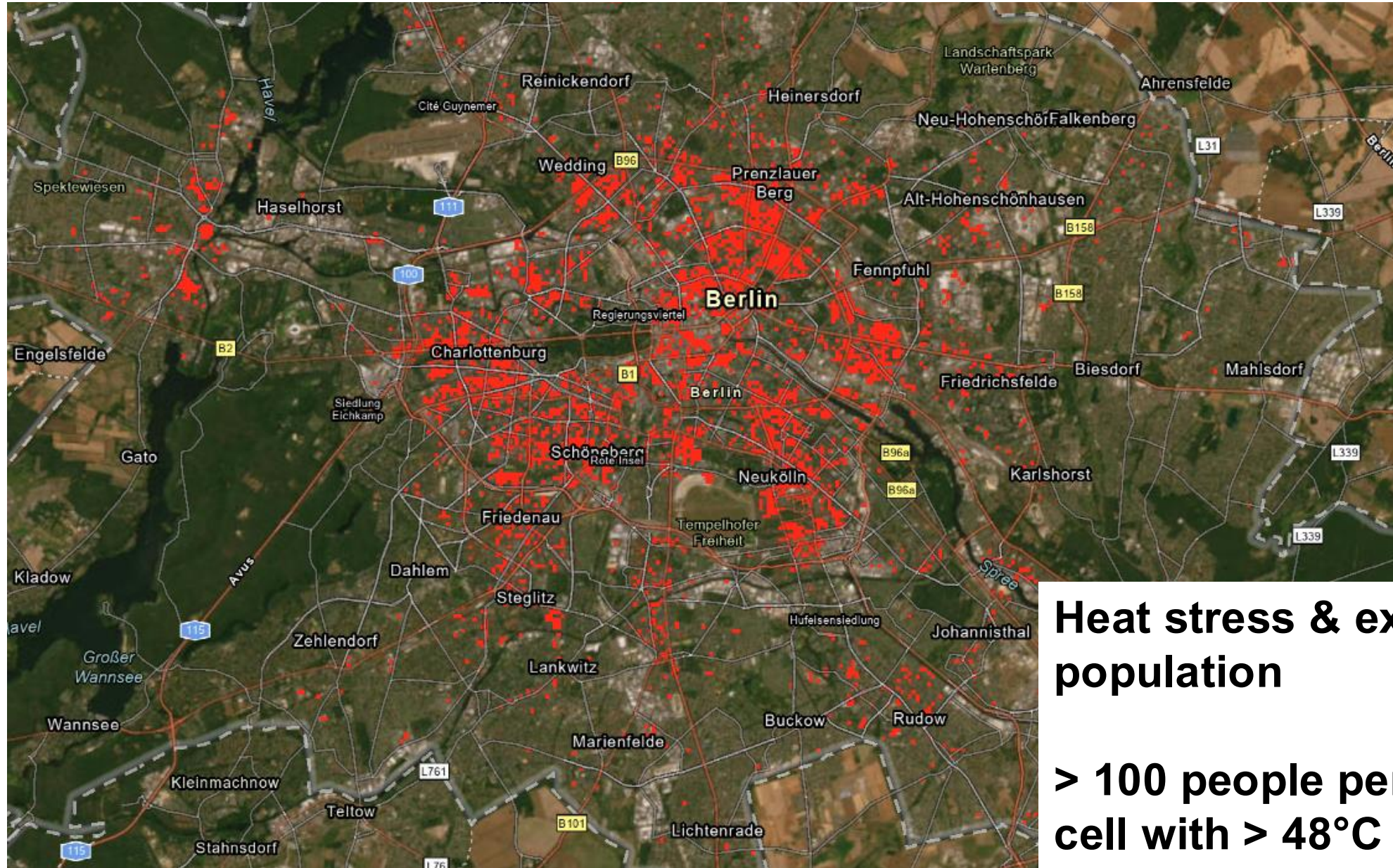
"Where have nighttime temperatures exceeded 30°C ?"



**Absolute temperatures
during heatwave week**



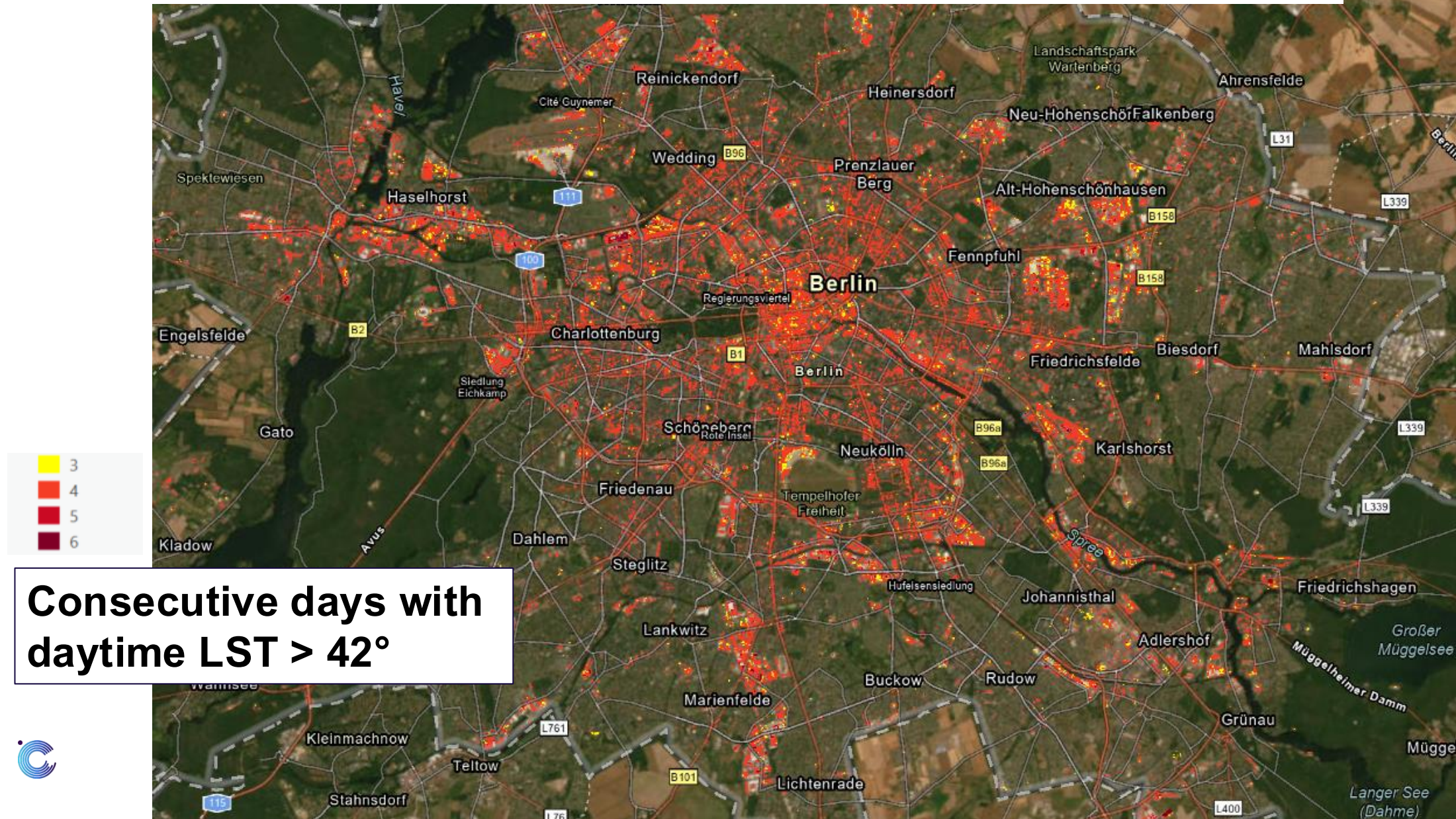
"Where are dense populated residential areas with nighttime temperatures above 30°C ?"



Heat stress & exposed population

> 100 people per grid cell with > 48°C LST

"Can we do this analysis for large cities like Paris and **Tokyo** and compare them?"

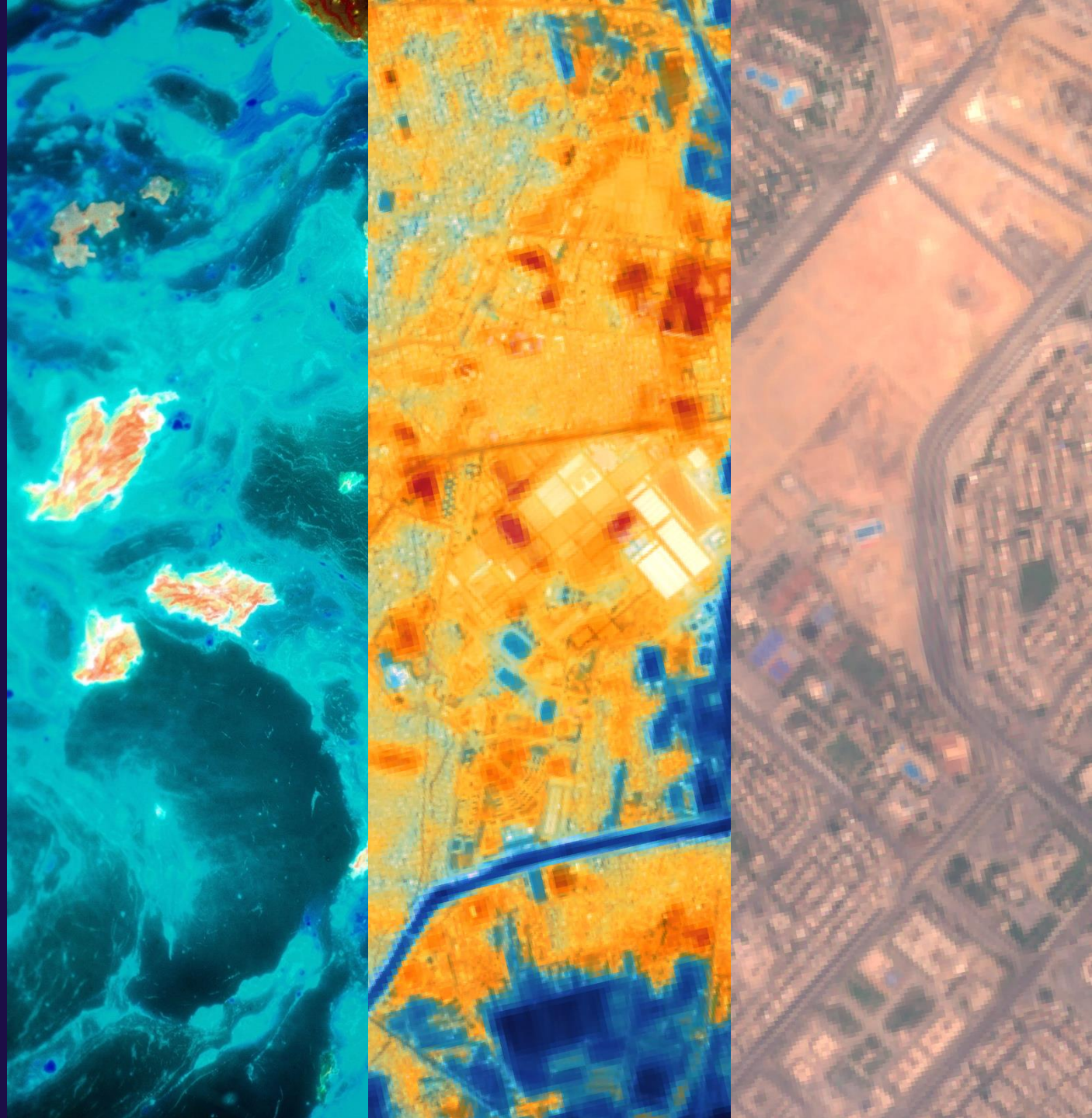
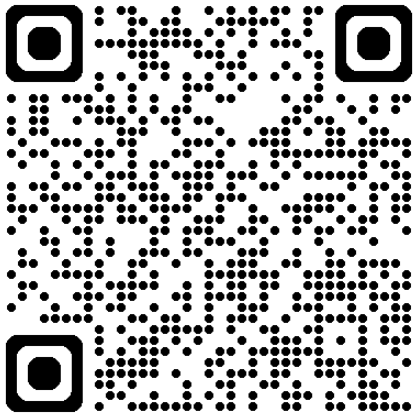


Consecutive days with
daytime LST > 42°

THANK YOU!



Explore our data:
Knowledge Center & Open Data Program



THANK YOU!



Explore our data: Knowledge Center & Open Data Program



CALL FOR COLLABORATION CONSTELLR × JAPANESE COMPANIES

- **Become a constellr Data Partner:** integrate our high-resolution thermal & optical satellite data into your solutions
- **Develop New Analytics & Use Cases:** leverage constellr data to create innovative applications and services
- **Become a Reseller:** offer constellr data and services to customers across Japan
- **Co-develop Solutions:** collaborate with us on pilots, demonstrations and new commercial applications
- **Explore New Markets Together:** combine constellr's satellite capabilities with Japanese industry expertise and customer networks