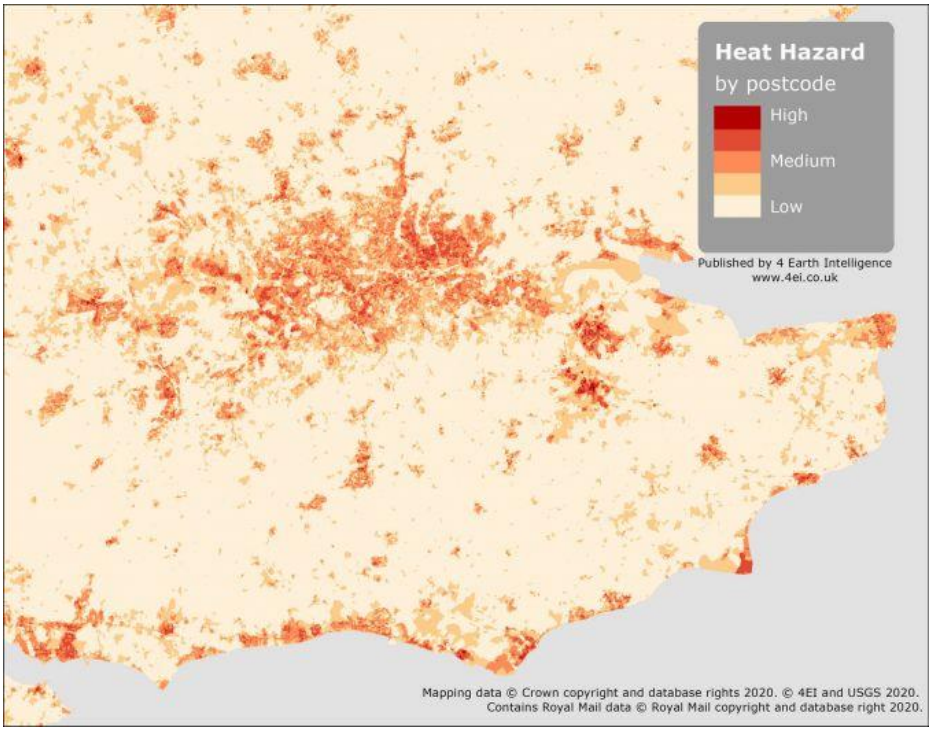
EO-FIN

Heat Hazard Maps



South East England heat hazard map by postcode (Source: 4 Earth Intelligence company).

Product Category

☐ Land Use	☐ Natural Disaster	☐ Coast Management	☐ Earth's Surface Motion
☐ Land Cover	■ Climate Change	☐ Marine	

Financial Domain(s)

■ Investment management ■ Risk analysis ☐ Insurance management ☐ Green finance

User requirements

UN12: Analysis of potential risks in specific regions.
UN14: Need to screen the feasibility of projects against different hazards criteria.
UN41: Need to monitor the impact of increased temperatures on assets.

Description

financial management sector by identifying areas prone to extreme heat events. These maps utilize satellite imagery to visualize temperature variations and heatwave patterns across a region. By highlighting regions with high heat risk, financial institutions, insurers, and investors can assess potential impacts on various assets, such as real estate, infrastructure, and agricultural holdings. Heat hazard maps are based on Land Surface Temperature (LST) that can be calculated based on the data from thermal sensors on satellites. By comparing LST with its historical record, it is possible to generate heat hazard maps that categorize levels ranging from minimal to severe.

Spatial coverage target

Asset level

Data throughput

Rapid tasking	☐ High	■ Low
Data availability	☐ High	■ Low

Product specifications	
Main processing steps	LST can be calculated at a relatively high spatial resolution (30 m) through equations based on the thermal bands from Landsat. Otherwise, there are some publicly available LST data from Copernicus at lower spatial resolution (5 km), but with very high temporal frequency (~ 1 hour). Afterwards, by comparing LST data with its historical record, it is possible to generate heat hazard maps.
Input data sources	Optical: Landsat series Radar: N.A Satellite-based products: LST from Copernicus Land Services Supporting data: N.A
Accessibility	Landsat series: is freely and publicly available through NASA. LST is from Copernicus Land Services: is publicly and freely available from Copernicus
Spatial resolution	Landsat series: 30 m LST is from Copernicus Land Services: ~ 5km
Frequency (Temporal resolution)	Landsat series: 16 days LST is from Copernicus Land Services: hourly
Latency	Landsat series: ≤ 1 day LST is from Copernicus Land Services: ~ 4 hours
Geographical scale coverage	Globally
Delivery/ output format	Data type: Raster File format: GeoTIFF
Accuracies	Thematic accuracy: 80-90% Spatial accuracy: 1.5-2 pixels of input data
Constraints and limitations	■ The unavailability of higher spatial resolution thermal sensors. ■ Low temporal frequency of Landsat data (16 days). ■ LST data can be influenced by atmospheric conditions, such as clouds, aerosols, and water vapor. These factors can introduce inaccuracies in temperature measurements, especially in cloudy regions.
Level of skills required by users to use the EO service	Skills: Essential Knowledge: Essential
Similar Products	Name of the Product: Heat Hazard Map over Great Britain (link) EO provider: 4 Earth Intelligence Spatial resolution: 30 m Temporal coverage: they used Landsat 8 data for summers of 2017, 2018, an 2019. Geographical scale coverage: Great Britain Accessibility: contact 4 Earth Intelligence company to discuss eligibility, coverage, and data access.